

THE HISTORY OF A HAMBURG-BASED FAMILY COMPANY



FOREWORD

No noteworthy event ahead, no special anniversary, the bicentennial celebration still on the distant horizon – why then the need for a chronicle?

Beginning this book with a question calls for a corresponding answer. Nothing could be simpler than that: In written form and visually, the intention here is to unfold the history of a Hamburg-based family company that, withstanding the test of time, has surmounted misfortune and turmoil with hard work and perseverance through until the present day.

Simultaneously, however, this also represents a chapter in the history of the Free and Hanseatic City of Hamburg spanning almost two centuries. With its close affinity to the city as firmly established and respected citizens, the Krüss family has always been intricately linked with technical and economic developments in Hamburg. In addition, this chronicle also presents a panoramic overview of the optical industry from the late 18th century until the present. This task alone justifies the chronicling of a family business that has kept pace with rapidly increasing technical advances, helping, in fact, to decisively pave the way ahead — followed ever since not only by generations of the Krüss family.

Generations: This word provides the real reason for unveiling a historical family portrait to a wide circle of friends and partners, across from Hamburg to locations all around the globe. On the basis of self-acquired knowledge, carefully kept records handed down by its ancestors and a wealth of historical documents - seldom found in any family enterprise nowadays – the fifth Krüss generation now intends to preserve for posterity all that should not be forgotten or lost: namely the lifetime achievements of family members both male and female over a period of almost 200 years.

Fostering Tradition as a legacy and commitment, whilst nonetheless respecting the constraints that cannot always be avoided — in this I see the purpose of maintaining its continuity. Those reading this chronicle will understand the significance of my words.

The warmest thanks are extended to my father, Dr Paul Krüss, who wrote a chronicle to mark the 170th anniversary of the company in which he recorded developments from its beginnings in 1796 up until 1966. It was therefore my personal wish to continue his work, to augment it, and, above all, to accurately document more recent company developments that have occurred in the years between the end of the First World War and the present. Chronological compilation of the brochures and price lists published in this period enable a comprehensive overview of the instruments that have been, and are still being manufactured. On this background, equal importance is shown towards both Science and Technology.

In this way I hope to have fulfilled the task I personally set myself...

Andres Krüss

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Original edition (1988): Contributions and review of material: Ing. Andres Krüss, Hamburg; Text: Ruth Vollmer-Rupprecht
 All illustrations and photos from the archive of A. KRÜSS Optronik GmbH

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Everything began in 1796

“Heligoland, an archipelago in the North Sea off the western coast of Schleswig and north of the Elbe and Weser estuaries, comprises a rocky main island, the so-called “Felseninsel”, and the “Düne” or dune. The latter isle is white and uninhabited. The main island, simply named LAND by the locals, is subdivided into an “Oberland”(upper island) or “Klippe”(cliff), and an “Unterland” (lower island), the population of which is expanding from year to year. The total circumference of the island amounts to 4,600 steps. Heligoland is ideally located for the purpose of privateering. With a lighthouse on its cliff, the island is also of extreme importance to shipping as the surrounding sea abounds in dangerous sandbanks and shallows. An essential task is performed by those 350 islanders that serve as pilots. In total, the population may number over 2000 inhabitants. The archipelago belongs to Denmark”.

These lines can be found in an encyclopaedia for the well-educated in print at that point in the island’s history when a baby boy, later baptised with the name ANDRES, was born to Peter Krüss and his wife Mike née Denker on the 21st of March 1796. In his case, an uneventful life was most certainly not foreseeable. Indeed, that was generally unlikely on Heligoland; this island with its distinctive red cliffs was no place to merely sit back and reflect. During the Middle Ages, Heligoland had in fact served as a significant pirate’s nest from which a companionship of buccaneers, known as the “Victual Brothers” or “Likendeeler”, controlled the Elbe estuary. Their misdeeds came to an end when a fleet of so-called “Englandfahrer”, the “England Voyagers”, set sail from Hamburg to fight a first bloody battle off the Heligoland coast in which the pirates, led by their ringleaders Klaus Störtebeker and Wichmann, were defeated, taken in chains to the Grasbrook island in Hamburg and beheaded.



1: The island of Heligoland with its landmark, the “Lange Anna”

Although this chapter had long since receded into the mists of history, Heligoland having meanwhile passed into Danish ownership, the island still stood out as a watchdog in the German Bight, its inhabitants then as ever the boldest seafarers.

The Krüss family was no exception to this heritage. Anything beyond the horizon aroused their spirit of adventure. It is therefore of no surprise to learn that, having arrived in Philadelphia as an immigrant on the 27th of September 1752, a Georg Christoph Krüss is named in the passenger list of the Pennsylvania German Pioneers. The brothers of Andres Krüss also bade farewell to the island. Jasper Krüss, who set sail for Australia, became a successful hotelier under whose direction the Hotel de l'Europe in Melbourne evolved into a renowned address for immigrants from the Old World. Peter and Paul Nummel departed for Hamburg and took up technical occupations.

For the purposes of this family and company history, however, we shall restrict our attention to Andres Krüss, responsible both for the foundation of our enterprise and its name. Those were troubled times of turmoil and unrest in which this Heligoland lad grew up. The year 1803 witnessed a further outbreak of the age-old hostilities between England and France during which the English enforced a blockade of the Elbe and Weser estuaries.

Hamburg's trade and commerce were thus brought to a virtual standstill. A dilemma which was intensified when the French occupied Hamburg and Napoleon imposed the Continental Blockade against England. To ensure its enforcement, possession of the German North Sea coast, in his words "the most important place on earth", was crucial. In shock and despair, the Hamburg business community was compelled to witness how, at a stroke, their livelihood was destroyed, with over three-hundred sailing vessels laid up in the port.

In 1807, during the Continental Blockade, the English occupied Heligoland, which led to a flurry of activity on the island. Black marketing ran rampant. Merchants from Hamburg and Bremen attempted to conduct their business from Heligoland. Trustworthy men were in great demand. On this background, therefore, 18-year-old Andres Krüss easily found employment with one such merchant. Moreover, due to his outstanding knowledge of Heligoland conventions and customs, Andres proved to be of invaluable service to his principal. As a result, he was not only paid a respectable salary, but, on resigning from his duties, was also presented with a quite considerable sum of money as a token of thanks. This he used to purchase a large quantity of coffee stored aboard a vessel that had run aground off Heligoland. Unfortunately, however, having found a customer in Bremen willing to pay an attractive price, Andres Krüss discovered that the matter came with a catch: The Heligoland youth was to ship the cargo to Bremen. And this meant circumventing the blockade.

Now although this had already been achieved by more than a few of Heligoland's skilled seafarers, their cargoes mainly consisted of contraband goods bound for Hamburg. Reaching Bremen would be a far more daunting task.

This notwithstanding, Andres had no intention of forsaking such a lucrative transaction. The cargo was loaded onto Heligoland sloops, crews swiftly found and the crossing over to the Weser estuary undertaken without incident. During the night and at low tide, the coffee was unloaded at a spot in the Land Wursten region and transferred onto waiting haycarts. The hay provided exceptional camouflage and, unbelievable as it may seem, Andres Krüss, now disguised as a farmer, made it through to Bremen safe and sound. Overjoyed at this successful coup, the merchant customer immediately paid Andres the agreed price in gold.

As it soon became clear, however, that the French authorities had somehow caught wind of this adventure, Andres considered it advisable to remain in Bremen for a few more days. How on earth did he succeed in returning to Heligoland, the sloops having long since sailed homewards?

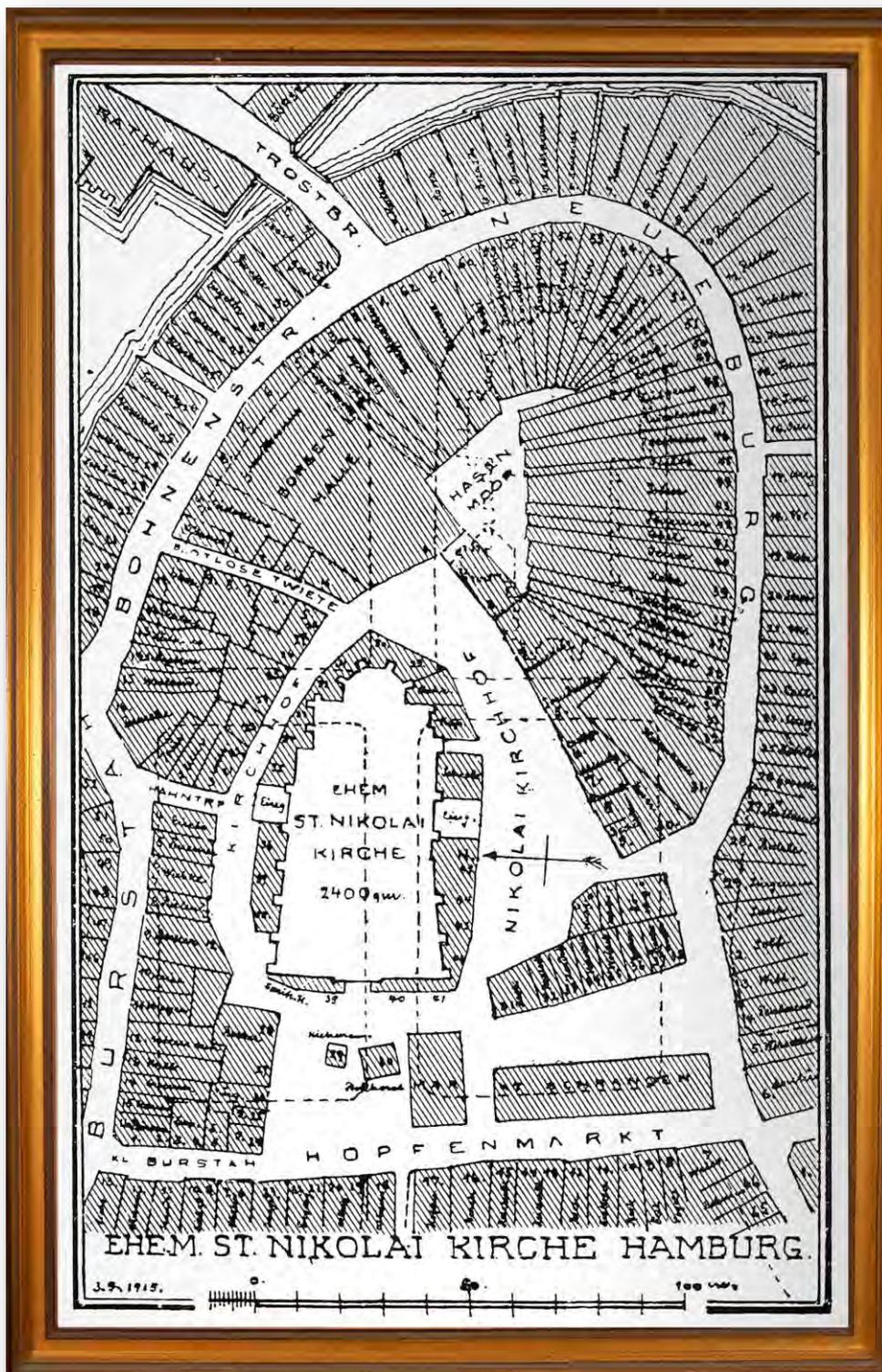
He then decided to struggle through to the town of Stade where, if the fates allowed, he might be able to slip aboard a vessel bound for Heligoland. With a belt pouch bulging with money secured around his waist, he reached the banks of the Elbe at Stade, where his plan almost backfired completely. A ship to Heligoland was indeed on its way downriver. Commandeering a small boat by simply tearing out its pile mooring, Andres sailed alongside, only to face the distrusting stares of the Heligoland sailors who refused to believe he was one of theirs on account of the young man's rustic clothing. Only after voicing his request in the inimitable Heligoland dialect was he welcomed on board. This adventure was yet to reach its climax, however, for French warships were on patrol before the Elbe estuary. Placing their trust in the strong wind and their own skilful manoeuvrability, the Heligoland crew sailed onwards, until a burst of gunfire shredded their sail. The rapidly worsening storm caused the ship, now filling with a constant stream of water, to drift further and further off course. All in all, it took two nights and a day for these totally exhausted men to finally reach the island. Although two sailors actually had to be carried into their houses, Andres made his way home on foot. Still in possession of the bulging belt pouch! The year 1814 at last marked a return to freedom: Napoleon was deposed. The King of Denmark had irrevocably ceded Heligoland to the English. Nothing could hold back Andres Krüss from his desire to leave the island: He wanted to join his brothers in Hamburg. We can assume that Andres arrived in the Free and Hanseatic City in the early autumn of 1814. Together with one of his brothers, he opened a cigar factory. Very little is known about these initial years in Hamburg. But the path ahead was firmly set when Fate brought together Andres Krüss and Mary Ann Gabory.

Their meeting was a culmination of the prelude to our company's history, the core of which was centred in the street Neue Burg, an area in which a Hamburg fort once stood, and where the lofty ruin of St. Nicolai Church now stretches up into the city sky. In 1796, having bought a house, No 14 (later 53), in Neue Burg, the optician and mechanic Edmund Gabory, accompanied by his family, arrived in Hamburg with the intention of setting up a workshop and store from which he could sell his instruments.

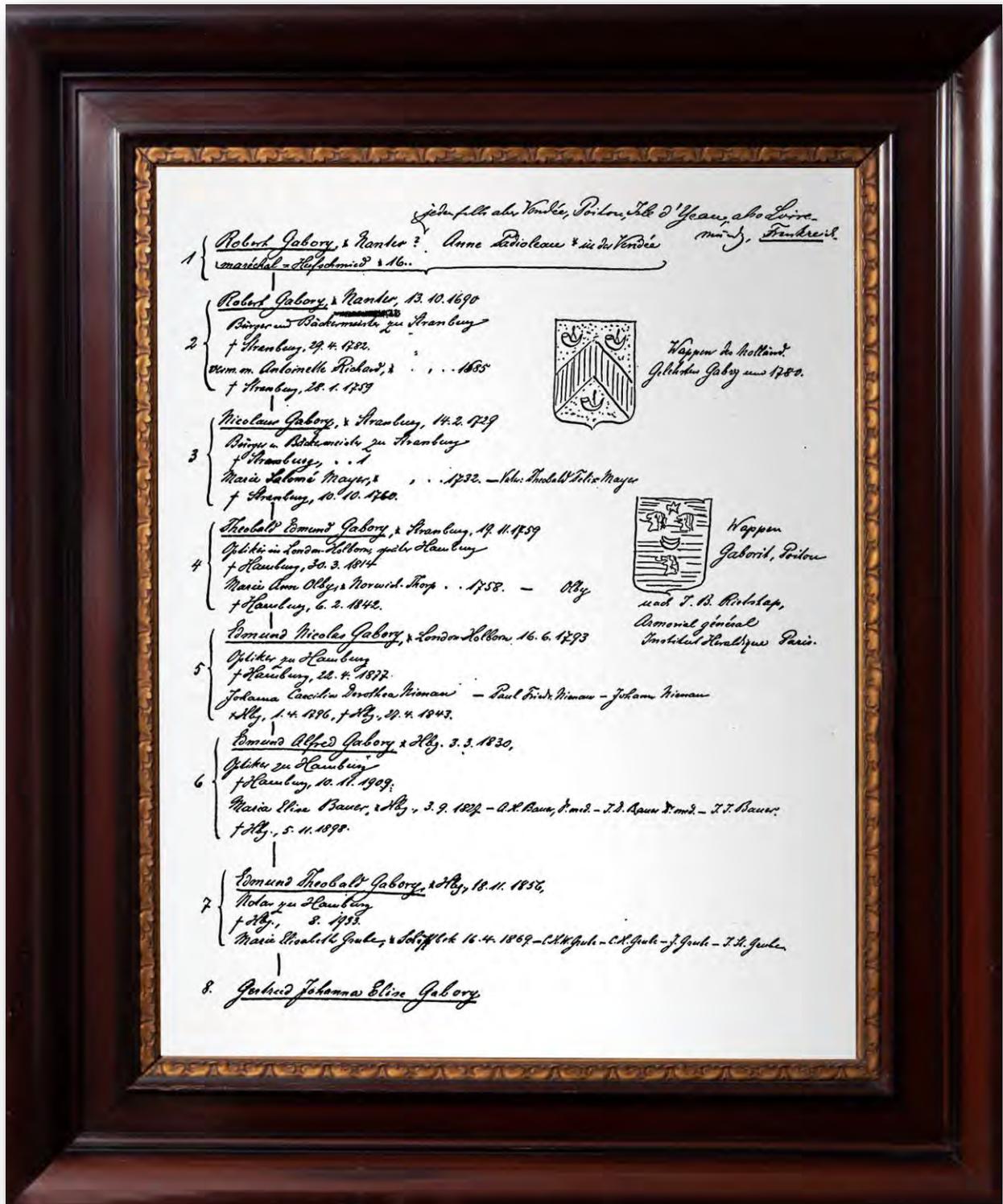
Edmund Gabory was a highly skilled and versatile man. Born in Alsace in the city of Strasbourg, he had profited enormously from an excellent apprenticeship under the tutelage of Jesse Ramsden, a London-based mechanic. Back then, the field of precision mechanics was flourishing in England. A student of John Dolland, Ramsden was able, in 1776, to perfect construction of a first viable circular grinding engine with which small-scale circles could be produced swiftly and with previously unattained accuracy. A man as talented and energetic as Gabory could not have found a better teacher. The student very soon decided to start his own business: In 1790, Gabory set up a workshop in the London district of Holborn. Five years later, his wife Mary née Olby gave birth to a daughter. Born on the 24th of February 1795, the girl was baptised at St Andrews Church in Holborn and named Mary Ann.

Edmund rightly foresaw that his expertise and professional skills could be put to profitable use in Hamburg, as a port and trading city the perfect base for a mechanic and optician. Soon, therefore, he was making successful progress, thanks not only to quality craftsmanship, but also to his diligence, decency and modest expectations. And his wife shared the same aspirations and goals. How unaware we are nowadays of the invaluable role played by such women — both as exceptional companions in unshakeably loyal partnership with their husbands, and as active assistants in ongoing research and development!

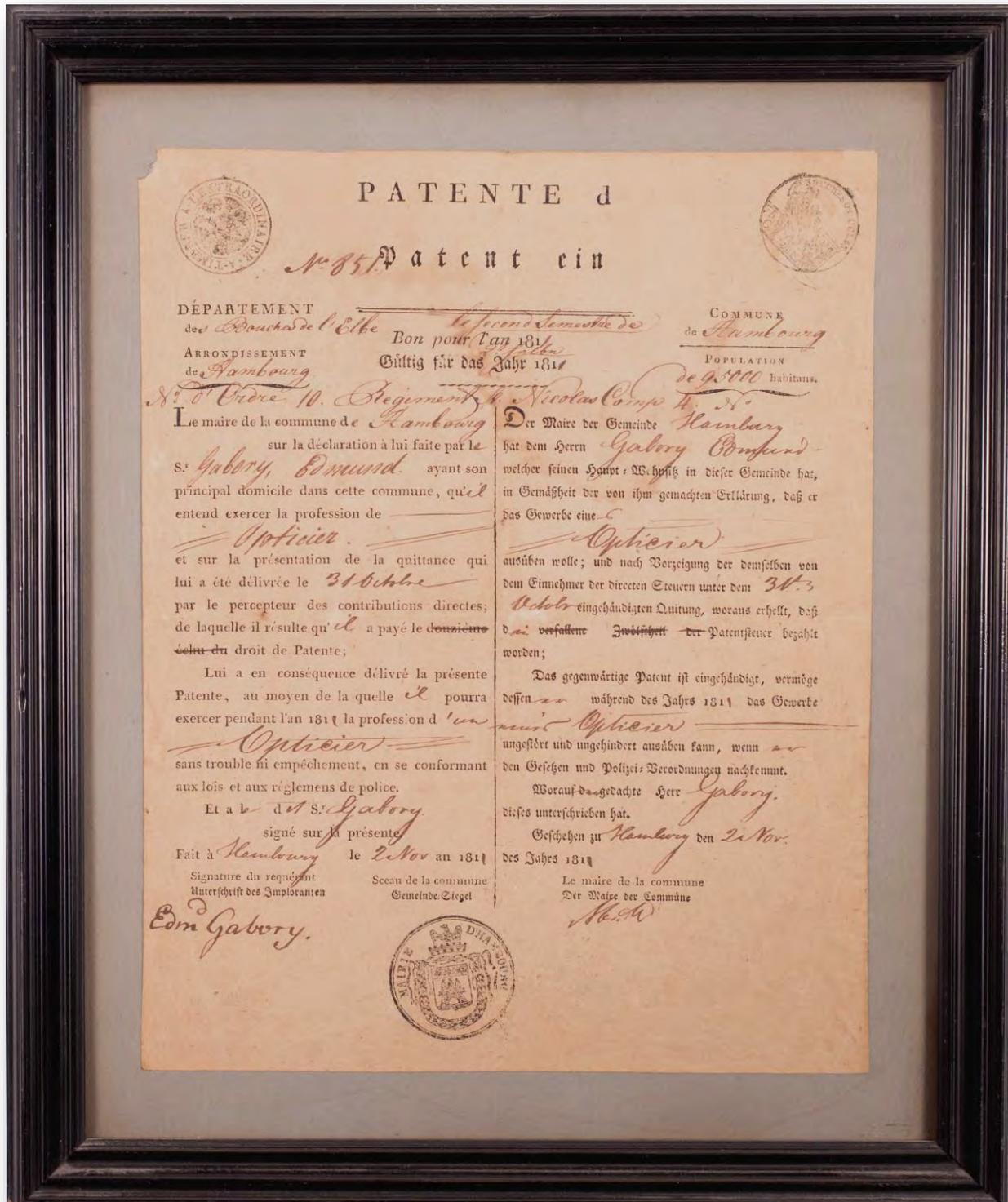
One example is especially representative of the close solidarity and attachment in this relationship. On the roof of his house, Edmund installed an observatory from which, with Mary Ann's active assistance, he found great pleasure in conducting astronomical observations.



3: Neue Burg No. 53, home and workshop of Edmund Gabory in approx. 1796



4: Ancestor list of the Company Founder Theobald Edmund Gabory



5: Work permit issued in 1811 during the French Occupation



6: ANDRES KRÜSS, born on Heligoland in 1791, died in Hamburg in 1848

Whenever cold or tiredness overcame him, he would awaken her with a bell, whereupon she came and took his place, thus enabling him to retire to bed. This bed was positioned in a room overhanging the courtyard, with a window above the headboard through which, during starlit nights, it was possible to confirm whether conditions were favourable enough to conduct astronomical observations. Until well into old age, Mary Gabory still looked through this same window whenever the weather was clear, and was able to determine the precise time from the position of the stars, regardless of the season. Together with his wife, Edmund Gabory constructed a life-sized horse for the purpose of indoor fitness exercises – hardly a customary pastime in that period just under two-hundred years ago. Edmund had correctly deduced that a friend suffering from an affliction of the joints was in need of therapeutic exercise. As the friend was unable to leave his house, Gabory constructed this “domestic horse” for him to ride upon. The natural equine movements were reproduced mechanically with the aid of a driving crank that had to be operated by hand. Sadly, however, this friend soon died and the now redundant horse, together with the many other experimental models that filled an entire room in the Gabory home, later fell victim to the flames of the Great Fire of Hamburg in 1842! His constant endeavour was to improve and perfect the instruments he manufactured. In addition to skill and ability, he also possessed exceptional scientific knowledge way above that required in his professional activities. He was therefore more than amply qualified to give lectures on the most recent research findings in the fields of optics and physics. On the 23rd of May, 1807, one such lecture was announced as follows in the Hamburg newspapers:

Tomorrow, Sunday, the 24th of May, from 11-1 o'clock, Experimental Physics with a lecture on the most interesting effects of two large galvanic columns of unlike size with 80 plate pairs, the breaking down of water into its two elements and restoration of the same by means of an electric spark; application of common and galvanic electricity in the medical field, and more besides. Entree 1 Mark
Edmund Gabory, Neue Burg No. 14

All trading activities in the Free and Hanseatic City were badly hit by the Continental Blockade. On attainment of full sovereignty, Hamburg was permitted to bear this title. The abdication of Emperor Franz II from the imperial throne had led to dissolution of the Holy Roman Empire, with the consequence that Hamburg lost its status as a “Kaiserliche Freie Reichsstadt” (Free Imperial City). Although Hamburg remained a free and sovereign city to all appearances until 1810, its internal administration was still the responsibility of the existing authorities, and the occupying forces - a bewildering succession of French, Italian, Dutch, Spanish and German troops - had yet to pack up and leave.

Not only was any trading or commercial activity virtually wiped out by the Continental Blockade, industries still in their infancy were also brought to a standstill, tradesmen and labourers were unable to earn their daily bread, and crushing taxes and requisitions ate up the fortunes of the wealthy. In 1807, payments were discontinued by 180 trading companies. But the worst was yet to come; a dispatch from Napoleon received on the 10th of December 1810 proclaimed the total annexation of the Hanseatic Cities and the appointment of Hamburg as capital of the “Departement des Bouches de l’Elbe” (“Mouths of the Elbe”).

1811 - Edmund Gabory receives the Optical Mechanic's Licence

Having only recently obtained the status of a Free and Hanseatic City, Hamburg was now swallowed up into the French sphere of influence and became "une bonne ville de l'Empire". A former senator, Dr Abendroth, was duly appointed as "Maire" (mayor) at the helm of the local administration, now renamed "Munizipalrat" (Municipal Council). A wise and adroit official, Abendroth was blessed with self-assurance and the ability, without submissiveness, to prudently back down at the right moment, thus preserving the city from many a calamity.

His name is recorded in the licence granted to Edmund Gabory on the 2nd of November 1811. On condition that he respect all the relevant laws and police regulations, Licence No 851 granted Gabory the right to pursue the profession of an "opticien", an optical mechanic, without let or hindrance. Written in both French and German, this licence bears the signature of Abendroth, the Maire de Commune, and has remained in the possession of the Krüss family until the present day. Allow me to draw attention to this point as our company was again granted a work and production permit 135 years later, this issued by a British administration. "Without let or hindrance" only applied on paper, however. All goods of British origin were confiscated and burnt. As a consequence, those valuable instruments and other articles that Gabory had acquired through his close ties with English manufacturers were also destroyed. The largest and best of his telescopes were requisitioned. Positioning them on the city towers, the French used these instruments to observe the surrounding area in order to obtain ample forewarning of any advancing enemy troops. Gabory suffered enormously from the loss of his instruments. They were, after all, an integral component of his work, his existence, indeed his life. And it was at exactly this point in time that his health also deteriorated greatly. In the course of his work he had incurred a serious injury. On the 12th of March 1813, he was therefore unable to witness in person the liberation of Hamburg by the Russian Colonel von Tettenborn and his Cossack troops. But his 18-year-old daughter Mary Ann could be seen in the midst of "the young maidens clad all in white who, in gratitude, partook in the universal jubilation" – as recorded in the family history.

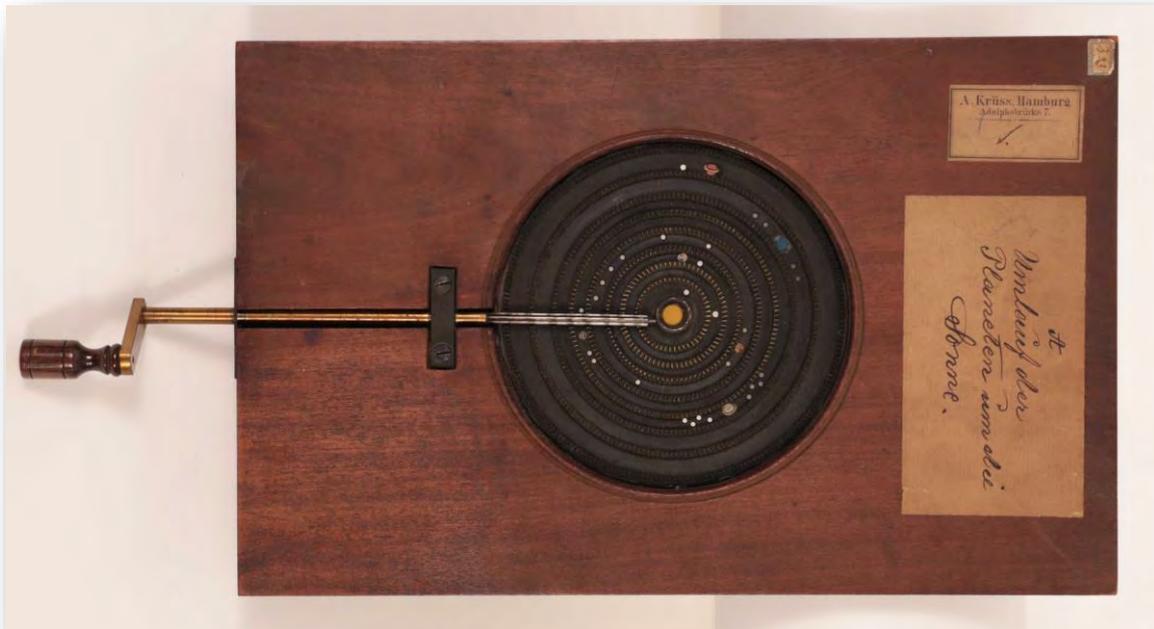
When Tettenborn urged the young men of Hamburg to take up arms, sixteen hundred of them volunteered to join the "Hanseatic Legion" within only a few days. Their ranks included the sick man's son, Edmund Nicolas. Born to a French father and an English mother, he fought to uphold the freedom of the city in which he had been raised. Badly wounded, he was soon transported back to his parental home. The pain he suffered was quickly augmented by the fear of reprisal, however. After a further round of short yet bitter fighting, the French re-conquered Hamburg, unleashing the reign of terror imposed under Marshal Davout. Having sided and fought with the Hamburg volunteers, Edmund Nicolas also now faced the threat of execution by firing squad.

But the young Gabory had influential intercessors. In addition, he had acquired an excellent knowledge of the French language from his father. For whichever reason, shortly after his recovery he was called up for duty in the offices of the French civil administration!

His father was forced to endure the dreadful period that now began in his sick bed, soon to become his deathbed. In early 1814, when suffering and misery in the city had reached an unimaginable level, he closed his eyes for ever. Unlike so many other Hamburg citizens, he had not been expelled from his home. He bequeathed his house and business to his children Edmund Nicolas and Mary Ann. His widow Mary Gabory, the loyal companion who had shared joy, sorrow and hardship with him over the years, nevertheless remained the heart and soul of the family. When she passed away almost thirty years later, she was deeply mourned by all who loved her.

Ausgabe		
bey Mary Gabory		
im Jahre 1823.		
den 11ten	Februar, Goldnen Ring	Ct. 10. 4
den 2ten	April, 6 mahagony Stühle	50.—
" "	" 2 Spucknäpfe	8.—
den 5ten	" 1 Sopha Tisch	47.—
" "	" 1 Fußschemel	3.—
den 28ten	May 1 Dutz. feine Messer und Gabel	11. 12
den 30ten	id 1 Vorschneidmesser mit Gabel	3.—
den 30ten	Juny 30 dopp: Ellen Leinen à 1 $\frac{1}{2}$ die Elle	30.—
" "	30 id. id. à 14 β "	26. 4
den 14ten	July 1 Tischtuch mit 6 Servietten	15. 10
" "	1 damastnes Tischtuch mit 12 Servietten	39. 6
" "	Zulage auf das damastnen Tischtuch	2. 8
den 25ten	Septbr. 8 künstliche Blumen à Ct. 1	8.—
" "	22 Ellen $\frac{3}{4}$ feine Bühren à 34 β	46. 12
" "	6 Ellen Bett Parchent à 40 β	15.—
d. 26ten	" 1 Paar seidne Strümpfe	5.—
d. 9ten	October 2 Lichtscheerenbricken Stück 12 β	1. 8
d. 11ten	id 2 künstliche Blumen à 12 β Stück	1. 8
d. 14ten	id Für Wein	66. 6
d. 15ten	id Für Wein	4. 8
" "	Fürs Brautbett zu stopfen	99. 4
" "	dem Bringer Trinkgeld	1. 15
den 17. October,	Für Blumen	1. 8
" "	silberne Uhr	14.—
" "	ein Paar Damenhandschuhe	1. 8
" "	für eine Kiste v. Berlin mit Hochzeitsgeschenk	2. 14
" "	Dienstmädchen. Brautgeschenk	15. 8
" "	Schüssel Confect Ct. 6, Bringer Trkg 8 β ..	6. 8
" "	Friseur gegeben	3. 14
den 20ten	" dem H. Pastor Scheiffler	16. 8
" "	Trinkelder an Mädchen, welche Gesch. brachten ..	14.—
" "	Verfertigen des Brautkleides	29. 5
den 13ten	Juny Zwei Lichtscheeren Stück 3 $\frac{1}{2}$	6.—
	Für ein Sopha	30.—
	für 6 Bouteillenbricken à 2 Franken Stück	8. 4
	für 2 Leuchter à 6 Franken Stück	8. 4
	für eine Theekiste	5.—
die Totalsumme der Ausgabe		Ct. 659. 10

7: Page from the budget book kept by Mary Gabory in the year 1823



8: Original instrument (equatorium) owned by the Gabory family and used for astronomical calculations and measurements



9: Original thermometer from 1870 owned by the Krüss family

Mary Ann Gabory and Andres Krüss

A decade after the death of Edmund Gabory, when the years of hardship had almost been forgotten, Mary Ann Gabory and Andres Krüss exchanged their wedding vows. On the 12th of October 1823, they were joined in marriage by Pastor F. G. Schuster of the Reformed Church. In the previous week, Andres Krüss had become a Hamburg citizen.

According to the passport issued to him for the purpose of a trip to Emden, Andres Krüss was small in stature, had blonde hair and blue eyes and finely chiselled features. Dark haired and also small in stature, Mary Gabory was both vivacious and friendly – traits she displayed until old age. No record exists of the manner in which this couple first met.

It is quite obvious, however, that the young Heligoland-born groom was interested in nautical matters of any kind. This was confirmed when Andres closed down his cigar factory and joined the Gabory enterprise, which he now led together with his brother-in-law Edmund Nicolas.

Business with self-manufactured instruments had been in steady decline since the death of the company founder. With Andres Krüss at the company's helm, the sale of nautical instruments and charts now assumed a predominant role. Enlargement of the salesroom led to the opening of a larger and more attractive shop at the Neue Burg premises. The convenient location in close proximity to the harbour was a key advantage now that trade and shipping were on the path of recovery. The era of colonial mercantilism, when traffic to and from the colonial territories had been the exclusive preserve of their mother nations and business in Hamburg restricted to on-carriage or transshipment duties, was now over, thus opening up the world at large to our Hamburg-based merchant. Having gained political and economic independence from their former colonial masters, the South and Middle American States opened up their harbours and entered into friendship-, trade- and shipping agreements. Hamburg's shipping lines profited greatly from the busy traffic to and from across the Atlantic Ocean. As did the company that still bore the name of its founder, an extensive wholesale warehouse for optical products having meanwhile been set up to augment business in the shop. The Gabory enterprise was particularly successful in the Nordic Countries, but also overseas. At this company, Andres Krüss found a professional environment that was perfectly suited to a man of his integrity and vigour. His marriage to Mary Ann was a happy one. The strong bond between them was secured even more tightly on the birth of their two sons. Edmund Johann, the elder boy, gave his first cry on the 30th of July 1824 at 4 o'clock in the afternoon and was baptised by Pastor Freudenthal in the Church of St Nicolas on the 18th of October. He was the great-grandfather of the writer of this Chronicle. The second son, William Andres, was born on ? February 1829 and baptised on the 29th of March. In the meantime, Edmund Nicolas, the son of the company founder, had also married, and the two families remained in close contact. In the winter, they all lived together at the house in Neue Burg, whereas the summer months were spent at the family-owned country house in the Grindelhof area - then still referred to as "Buten van Dammtor" ("Beyond the Dammtor Gate"). Beloved by all, the founder's widow Mary Gabory also lived together with them. The children reached adulthood, technically gifted and interested in all things new. In April 1841, Andres Krüss sent his eldest son Edmund to Stuttgart, where the seventeen-year-old was to begin an apprenticeship under the tutelage of Geiger, a mechanic and optician by appointment to the royal court. During his own apprenticeship in England, the youth's grandfather, Edmund Gabory, had made the acquaintance of a young citizen of the Kingdom of Württemberg. This youth returned to Stuttgart where he eventually set up a business incorporating a workshop for precision mechanics in the Ramsden mould and another for the grinding of optical glass, both of which were later taken over by Geiger.

On successfully completing his apprenticeship, Edmund Krüss attended the Stuttgart Technikum, the local technical college and forerunner of the future Technical University.

Letters that travelled back and forth between Hamburg and Stuttgart are indicative not only of the heartfelt affection between the son and his parents, but also of mutual concern for one another, of understanding and boundless love. As revealed in this excerpt from a letter written by the father to his son:

"I am really pleased at the manner in which you are leading your life and believe and hope that you will thus turn into a healthy and strong man. You cannot imagine the joy and comfort your parents feel in seeing you so admirably fulfil the high standards we expect from you." And in lines written by the mother in another letter: "Hopefully you have since taken communion? How are you enjoying your studies at the polytechnic college? Are the lessons fruitful? Is your musical ability progressing, are you playing a lot and does the practice afford you pleasure? Have you bought a new tailcoat? Are you receiving dancing instruction?"

The wish to attend dancing lessons expressed by the son in a letter to his parents received the following favourable response: "I gladly approve of your desire to take up an entertaining pursuit that is so beloved by the young, but always practise this in moderation and refrain from consuming cold beverages, especially with an overheated body, as many a lamentable catastrophe has thus been caused, this your parents earnestly request of you."

Health concerns are also apparent in the following lines: "You find pleasure in smoking, as is often the custom at your age, but I urge you not to indulge in this habit excessively as it could lead to greater deterioration of your health and premature harm to your teeth than you would wish for ..."

In similar vein, the letters written by Edmund to his parents reflect his own concern regarding their welfare. Above all when the Great Fire of Hamburg destroyed almost everything that his parents and grandparents had built up over the years. And Edmund Krüss was never again to see his parental home. The conflagration began in the first hour of May the 5th 1842. The city was fast asleep, festive celebrations lay ahead: The 5th of May was Ascension Day. Then, all of a sudden, the fire bell in the tower of the Church of St Nicolas began to peal. *"Füer in de Diekstraat!" (Fire in Deichstraße)* the night watchmen cried, their shrill and urgent warning echoing through the silent streets, alleyways and passages. Fire in Deichstraße! The Hamburg residents rolled over in their beds. The fire brigade would surely be able to bring things under control. After all, fire alerts were an almost nightly occurrence. And Deichstraße was a street close to the waterside. Extinguishing the blaze would pose no problem. Awoken by the alarm, Mary Ann Krüss was unable to fall back asleep as the bells continued to ring no less than 25x. That announced the outbreak of a major fire. But then the pealing was reduced to five strokes, which enabled the family to proceed with their plan for the feast day. In the company of the Gaborys, pictures were to be taken at the country house in the Grindelhof area: daguerreotypes! Having arrived from Paris with the very latest equipment, a certain Herr Neuberg had already daguerreotyped images of William and his parents onto a metal plate. This was sent to Edmund in Stuttgart. Typical of such early photographs, the parents have assumed stern expressions, their youngest son standing behind them in a similarly rigid pose.

This picture has survived the passage of time together with others taken at the country house on that far off Ascension Day. After Herr Neuberg had been picked up at the Hotel Belvedere, the group set out in a hackney carriage to undertake a busy day of daguerreotyping. In a letter to his son, the father reports the proceedings as follows: *"We spent a pleasant day in the open air. Gabory took a picture of his wife and I one of your mother. Both turned out admirably, but that of your mother has been captured in crystal-clear sharpness."*



9: Edmund and William Krüss, two students in the year 1844



10: *Mary Ann Krüss née Gabory, born 24 February 1795, died 28 November 1858.
Photograph by Andres Krüss, 1842, taken on the first day of the Great Fire of Hamburg*

The Great Fire of Hamburg 1842

Although it was still possible to enjoy a pleasant lunch together, the group soon saw their cheerful mood disintegrate. News arrived that the fire had broken out anew and was now raging furiously. Transport by coach was hurriedly arranged and everyone conveyed back into the city. The dramatic events that followed are best described by Andres himself:

"Imagine our shock when, on arriving back in Neue Burg at 2 o'clock, we saw that the whole area had been cordoned off by the military, the flames having already reached the marketplace at Hopfenmarkt. I nonetheless remained unaware of the danger to our house until 3 o'clock, when I saw fire also break out in the St Nicolas church tower which was soon fully ablaze, a dreadful signal that the time had come to rescue what could be rescued, but in which order? Most importantly, the money and documents kept in the house were now carefully wrapped and taken into the safe custody of Herr Leinau at his home in Kleine Reichstraße. The packing now commenced, I managed to rescue bed linen and a mattress, but no chair, no table, no sofa, all had fallen victim to the flames, no bedstead. Even though we were able to rescue merchandise to the value of approximately 8000 Marks, this was only possible with the aid of several friends. These included Dr Rothenburg, my brother Peter Nummel and his sons Johann and Jacob, Kottensen, Ballin ... Now the police arrived and urged us to evacuate the house as the tower was in danger of collapsing. Convinced as I was, however, that no danger was yet posed, I urged everyone to remain steadfast and to rescue what they could.

At 5 o'clock the tower collapsed, heralded beforehand by the terrible sound of the alarm bells pealing; we were now ordered to leave the house by 6 o'clock as nearby houses were to be demolished with explosives, some of us nevertheless continuing with the task at hand until 7:30. It was then no longer possible to pass by at the Stock Exchange and only with great effort were we able to cross over the canal via the Reimersbrücke bridge, where the midstream bollards were already ablaze, and in such manner I made my way to Leinau's home with an enormous bundle of bed linen on my back . . ." And in account sent to her son the mother writes:

„... It was heartbreaking for me to see your father staggering along the the street, his poor tired shoulders burdened with this one final load, an unbelievably huge bundle of bed linen. Hardly had we deposited our salvaged belongings with Herr Leinau, however, when his home, too, was placed in the gravest danger and he consequently began to empty both house and storeroom. Only at great effort and expense and utterly exhausted did we find an available hackney carriage, which we loaded with absolute essentials and set off for our country house, arriving there at half past one in the morning. As fate would have it, we had very recently instructed our bailiff in Hummelsbüttel to bring us a cartload of wood. Fortunately, he arrived at the Grindelhof only a few hours later, whereupon we swiftly unloaded the cart and Father jumped up next to the bailiff's son in order collect those belongings that still remained in the safekeeping of Herr Leinau. The latter had already emptied his house and storeroom, when – luckily - the wind changed, thus sparing the street from harm "

On the 1st of June, Andres Krüss was already able to take stock of the situation: *"All the goods are now back here with Leinau, at whose house, initially for a two year period, we have taken the precaution of renting three rooms, one of which, located downstairs in the entrance hall, is to serve as a shop, the upstairs two, one floor higher, look out onto the street. The price requested, 500 Marks, we consider to be more than reasonable when compared with that for other rented premises, and is chiefly a token of the friendship that exists between us. As regards the forthcoming winter and beyond, however, we have not yet found permanent accommodation and shall have to do so in a timely manner" But, for now at least, the family had a roof over their heads at the home of a good friend and still owned the Grindelhof country house.*



11: *Trostbrücke and Neue Burg on 5 May 1842 (the house and workshop of Andres Krüs can be seen in flames on the left)*



12: Hamburg: The ruins in the area around the River Alster (Jungfernstieg and Lombardsbrücke) after the fire of 1842 (daguerreotype by C.F. Stelzner)

The Great Fire had raged with devastating consequences. Around one quarter of the city, what is more the most important part both economically and historically, namely the Altstadt, its ancient core, now lay in ruins. 71 streets with 1,749 houses and 102 warehouses, several churches and civic buildings, all had been destroyed. 20,000 people had been made homeless. Andres Krüss nonetheless plucked up fresh courage:

"The furnishings are insured by Bieber to the value of 5, 000 banco marks, but much more was destroyed in the flames and I do not believe that 20 % will be paid. We insured our merchandise with the Gothaer Bank to the value of 30,000 banco marks, and this bank will pay in full. The inventory in our warehouse has not yet been fully assessed but, apart from the goods that were rescued, we can assume that stock to the value of 60,000-70,000 marks has been destroyed. What is lost is lost. Armed with fresh courage and strength, let us get to grips with the challenges now facing our business and thus attempt to forget the deep wounds inflicted."

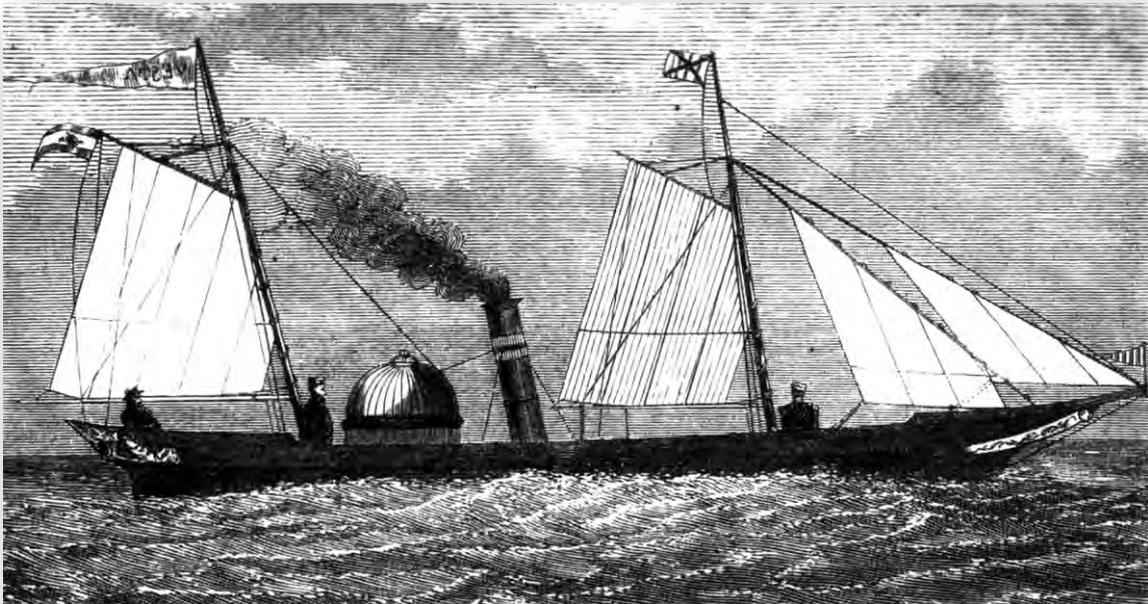
These were no empty words, for Andres Krüss was not one to complain.

"We can thank the Lord that we need not yet think twice about every coin we spend, but prudent thrift is advisable."

By Christmas, business was increasing more markedly than expected. But the modest way of life now followed by the family is still apparent in these lines written by the mother to her son:

"On Christmas Eve Father and I were in the shop until 21:30. We were both filled with melancholy as we made our lonesome way towards the gate. Each with a small package under their arm for William, who, for hours already, had been awaiting our return. Only two short years ago we all still celebrated together so cheerfully. Oh, Edmund, on passing through the gate into the deep dark night in which it was no longer possible to see the brightly illuminated houses or hear the sounds of merriment, my heart felt unbearably heavy and I was unable to hold back the tears. Father walked by my side in silence. In such spirits we arrived at our lonely dwelling. Our sweet-tempered Willy had undertaken all in his power to afford us pleasure. In pride of place there stood a hand-wash basin with a bar of fragrant soap for me, and, just imagine, a pair of red house slippers lined with rabbit fur for Father. The dear boy had practically emptied his money-box. Your picture was taken from the wall and, as usual, stood on the table between Father and myself... "

With the return to his native city of the eldest son in whom they set such high hopes, the parents were to see their wishes more than amply fulfilled. After 21 years of fruitful work side by side under the roof of the company that Edmund Gabory had founded, Edmund Nicolas Gabory and Andres Krüss parted ways. Gabory continued management of the existing business at Adolphsplatz No. 3. Andres Krüss founded a new company under his own name in Alter Wall. The 11th of November 1844 thus marked the actual birth of the KRÜSS company.



13: Screw steamship built by A. Krüss, 1859

The path into a new era

Krüss, Opticus

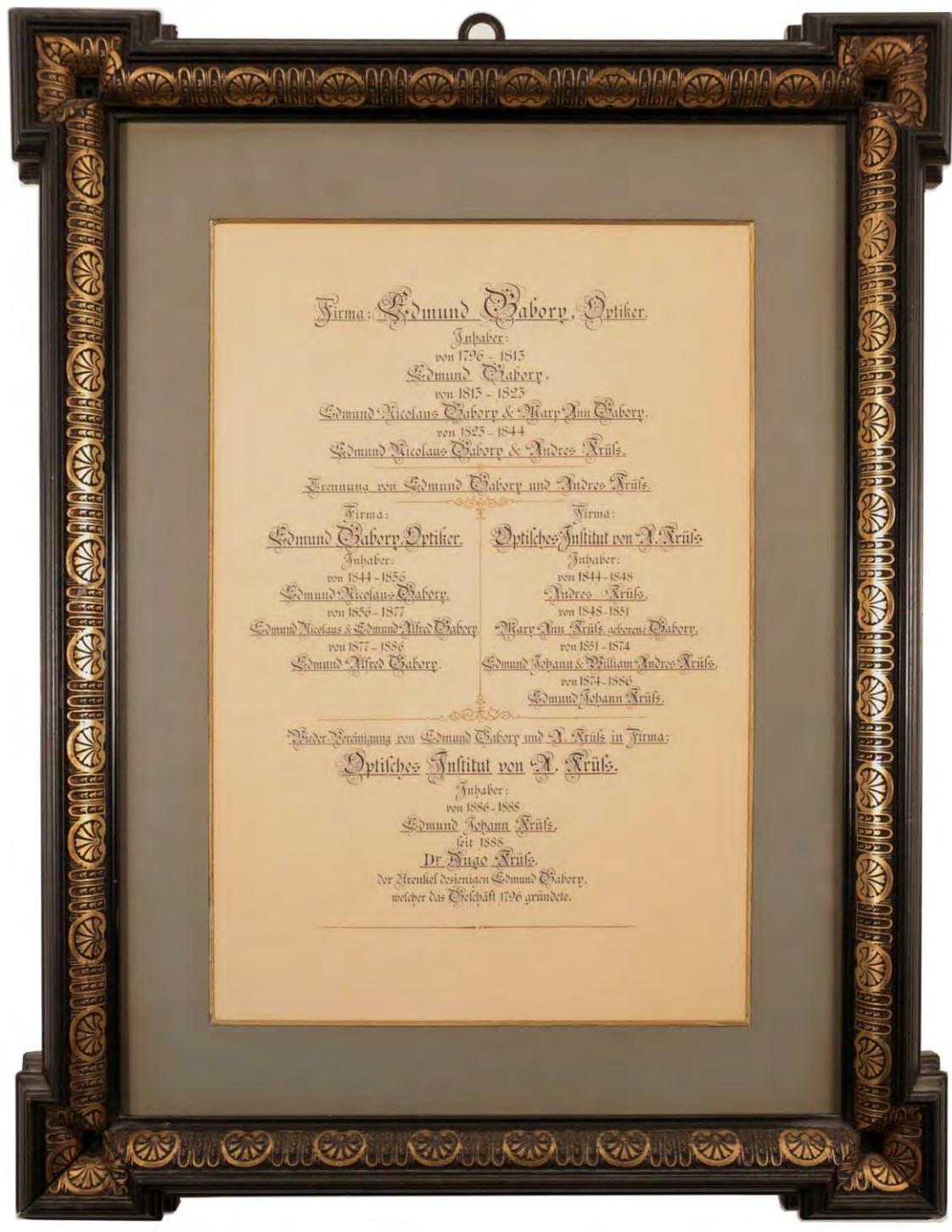
Alterwall, on the corner to the Adolphsbrücke

should like to take this opportunity of recommending to all friends and honoured members of the public a well-assorted selection of his optical, mathematical and physical instruments, etc., including numerous articles ideally suited as gifts for the Christmas season.

In this announcement Andres Krüss informed his customers and all his friends that he had founded a company of his own. The shop on Alter Wall at the corner to the Adolphsbrücke, a bridge across the Alsterfleet canal, was officially opened on the 11th of November 1844. The family simultaneously moved into an apartment at the new business premises. The fledgling company soon began to flourish, thanks in no small measure to the son's active involvement. It was not long before Andres Krüss abandoned use of the title "Opticus", instead referring to himself as an "Optician and Mechanic". He next assumed exclusive representation for the gas apparatus manufactured by the company Liebig & Sohn, with which, in his words, "it is possible, with minimal effort, to produce one's own sparkling wines, lemonade and soda water". He also recommended his patented water filters, "for good clear drinking water is undoubtedly the primary means of preserving good health in families. Even marshy or swampy water can be made crystal-clear and pure in taste. Now more than ever, I should like to take the opportunity of strongly recommending the use of our patented water filters to the honoured members of the public."

What a cruel twist of fate, therefore, that the man who had praised the benefits of these appliances so highly should himself die of a disease that had its origins in Hamburg's waters: Cholera! During the 19th century the port city was stricken by several cholera epidemics, most of which broke out in areas close to the River Elbe. Although the epidemic of 1848 was not on a scale comparable to the major catastrophe of 1892, when over 8,600 victims died, each outbreak of this pestilence took its toll. A price which the Krüss family was also compelled to pay: On the 25th of October 1848, Andres Krüss contracted cholera and passed away in the 58th year of his life. For the family, it was inconceivable that their driving force had been silenced so abruptly. Full of vitality, this energetic 57-year-old man was torn from a life in which he had successfully and gladly taken on each new challenge without complaint, a citizen held in the highest esteem by his peers and bearer of the title "Worshipful Master" at a local Masonic lodge. Just one week before his death, Andres and Mary Ann Krüss had still been able to celebrate their silver wedding anniversary in the company of their dearest. The young enterprise, too, was badly hit by the sudden death of its founder. But the Gabory grandson immediately followed in his father's footsteps, instilled from early on with an awareness of the need for direct succession. The transition was effected smoothly. On the 1st of November 1848, Mary Ann Krüss, now a widow, sent the following announcement to the company's steadily increasing clientele and their business friends:

In herewith fulfilling the sorrowful duty of informing you of the death of my beloved husband, Herr Andres Krüss, on the 25th of October 1848, I should also like to take this opportunity of announcing my intention to continue, under the existing company name, the business with optical, mathematical, physical and nautical instruments which my deceased spouse conducted over a number of years. I have conferred the task of managing the company to my eldest son, Edmund Krüss,



14: The managing owners of the Krüss enterprise until 1920



15: Price list for the Christmas season 1847



16: *Andres Krüss, optician, born 21 March 1791 on Heligoland, died 25 October 1848 and wife Mary Ann, née Gabory, born 24 February 1795, died 28 November 1858, together with their two sons: Edmund Johann Krüss, born 30 July 1824, died 30 November 1906, and (on the right) William Andres Krüss, born 28 February 1829, died 1 June 1909 (Photograph by H. Biow, Hamburg, 1845)*



17: Patent for the water filters distributed by A.Krüss
A cruel twist of fate: Andres Krüss died of cholera. A bacterial infection transmitted by contaminated drinking water, against which he had warned in his advertisement

who having been involved in such commercial activity from an early age, has stood at the company helm together with his father in recent years. As of today, with my authorisation, he shall also serve as a partner in the company. Hand in hand with my son, I shall strive to provide the most meticulous and dependable service possible in the hope of thus gaining the same favour that my late husband enjoyed.

Your most humble servant,

Mary Ann Krüss

At all times a reliable companion to her husband, the lively and friendly lady was actively involved in the business for three more years. In 1851 Mary Ann Krüss handed over control to her two sons Edmund and William.

The brothers complemented one another perfectly. Edmund had very soon been made aware of the path he was destined to follow. Prior to his apprenticeship and years of study in Stuttgart, he had already attended the Hamburg School of Nautical Navigation, which was linked to the Astronomical Observatory and a source of valuable knowledge for him. Thanks to his studies in Stuttgart, he had gained a particularly wide insight into the field of technical engineering. Spurred by the foresight of his father, William, the younger son, studied Medicine in Kiel, Marburg and Berlin, and from an early age showed a lively interest in and understanding of technical matters of any kind. These qualities were often to have a decisive influence on later developments at the company. William forged ahead with daring, Edmund preferring to reach his objectives with smaller and more cautious steps. The advantages arising from such a felicitous blend were particularly evident when the brothers jointly purchased the house at Adolfsbrücke No 7. The demanded 66,000 Marks Species and 30 Marks Hamburg Courant were raised without difficulty. On re-location of the company, Edmund drew on the practical training he had received, setting great store both on enlarging the workshop and on realigning business towards the production of mathematical and optical instruments. The energy and tireless commitment of the two owners was soon reflected in an unmistakable bustle of activity. In 1849, Edmund undertook an adventure of profound significance. Not only of importance to the aerodynamic research work and physical observations he conducted, this adventure also afforded proof of his sensitive core, moving him deeply and leaving an impression he was never to forget: namely the hot-air balloon flight on which he embarked in the company of the aeronaut Coxwell. Equipped with barometer, thermometer, compass and maps, Edmund made his way to the circus erected at Dammtor from which the balloon was to begin its ascent.

“Having convinced myself that the admirable and practical structure of the balloon would ensure a more than safe flight, I nonetheless braced myself for the dizziness and fear I might experience when looking down from such a daunting height; hardly had we risen from the ground, however, the magnificent and impressive panorama unfurled before our eyes was such that consideration of our welfare faded into total insignificance ... the group of people scattered around a field in Eppendorf appeared to us almost as if they were mere ink-spots on a green table cloth, in fact it seemed that I could cover the whole of Eppendorf with my hand. Some minutes later, we were no longer able to recognise the boats below us on the Alster Lake. Judging from the aneroid barometer which I had taken along, we had risen to a height of 2,500 feet“.



18: *Mary Ann Krüss with her two sons,
Edmund Johann Krüss and William Andres Krüss*



19: A barometer manufactured by Krüss won 1st prize at the 1855 World Exhibition held in Paris



20: Degree-view spectroscope (1900)
Astronomical telescope



21: Patented field glasses produced by A: KRÜSS (approx. 1865) with case showing the company address, Adolfsbrücke No 7



22: The business premises at Adolphsbrücke No 7, purchased jointly by the Krüss brothers in 1851 for 66,000 Marks Species and 30 Marks Courant.

Serving as company headquarters until 1920, this building was destroyed in World War Two

This increased to 4,920 feet, at which point Edmund believed he could identify the curvature of the earth's surface.

"The solemn stillness around us aroused an almost sacred sense of awe within me, all manner of thoughts and feelings filled my soul, how tiny Mankind and all human achievement now seemed, no greater in status than the humble earthworm when compared to the great and immeasurable universe that encompasses us; and yet, looking up at the balloon hovering majestically above our heads, I was also made vividly aware of the magnitude of the human spirit, capable of making even the elements its obedient slaves."

Thus wrote Edmund Krüss in a newspaper article for the "Oldesloer Wochenblatt" entitled "Der Freischütz" ("The Marksman"). For, as the balloon began its descent towards Hartenholm – then still named Harstenholm – the worst was yet to come.

"Floating at around 1,000 feet above the village, we suddenly heard a burst of gunshot fire, little aware that we were the intended target. Bewildered by the monstrosity looming above them, some local farmers gave free rein to the oddest fantasies."

One of their number firmly believed this to be "een flegender Kattenkopp", a flying cat's head, leading to a further round of frightened and thankfully inaccurate shooting. These deluded fellows nonetheless assumed that their marksmanship had downed the balloon, which in fact landed safely.

Although entertaining and of minor significance, this incident nevertheless reveals the wide chasm that separated technical progress and ignorance in those far off days.

In all likelihood, however, aspects of a different nature had played their part in the purchase of the house at the Adolphi'sbrücke; one day before business began at the new premises, Edmund Krüss announced his engagement to Agathe Auguste Bauer. This set a seal on the neighbourly friendship that already bound the two families, one that was to enjoy even closer ties when William married the younger sister Constance and cousin Alfred Gabory the eldest, Elise.

The father of the bride, Dr med. August Heinrich Bauer, born into a highly respected family of Hamburg doctors, had already died at the early age of 33, having contracted scarlet fever during his treatment of a sick patient. In accordance with the custom at the time, the mother, Anna Johanna Maria, née Damman, was henceforth addressed as Frau Dr A. H. Bauer, Widow. Diaries that meticulously record the fortunes of this long-established family and the lives of its members have been preserved until the present day. They are a reflection of the lives led by citizens of the 18th and 19th centuries. The widow raised her daughters devotedly, thus ensuring that they turned into upright, industrious members of society.

Although Agathe had long felt attracted to Edmund Krüss, she assumed that his interest was instead centred on Elise, her eldest sister. Only when a sudden downpour of rain interrupted their walk home from an evening concert was a first kiss enjoyed under the shelter of his umbrella. This sealed a bond that was later confirmed before God on the occasion of their wedding at the Church of St Jacobi on May 1852. This marked the beginning of a long and more than happy marriage.

The young couple moved onto the third floor of the house at Adolphi'sbrücke No.7, William and Constance occupying the second floor following their wedding one year later. The mothers, both widows, moved in together. Mary Ann Krüss passed away in 1858, Anna Johanna Maria Bauer in 1879. She was thus still able to hold her eldest great grandson at the baptismal font.

The Krüss enterprise starts to manufacture photographic lenses

In a world of ever advancing progress, business at the Krüss company continued to develop at a constant and steady pace. The ceaseless zeal with which the brothers set about their business was rewarded with the great success which, as the decades passed, would gain increasing worldwide recognition for the name Krüss. Due to the practical training he had acquired, Edmund placed great emphasis, when the business was re-located to the Adolfsbrücke premises, on enlarging the workshop and working towards a new objective, the production of mathematical and optical instruments.

Activities in the workshop centred on the manufacture of electrostatic machines, air pumps, steam engines and calibratable Dutch grain scales of a particularly high standard.

In 1859 the Krüss company set up an optical grinding facility at which photographic lenses were manufactured in accordance with the calculations of the Viennese professor Josef Petzval. The products concerned were fixed-focus double lenses for portraits up to a size of 3 inches, or for landscapes, maps and paintings.

In the opinion of Dr J. Schnauss, Chairman of The General Association of German Photographers, these lenses stood out for their exceptional luminous intensity, whilst simultaneously ensuring an extremely high level of image sharpness. This was acknowledged with a first prize at the International Exhibition held in London in 1862. One year previously, the Hamburg Society for the Advancement of the Arts and Useful Trades - better known as the "Patriotic Society of 1765" - had already awarded the Krüss company a first prize in the form of a medal made of silver, not only for its achievements in this field, but also for establishing a branch of industry then new to Hamburg.

Andres Krüss could now draw attention to his "specialisation in the production of lenses for photographers": "The quality appraisal given by the first photographers to use these instruments corresponds fully with that of the board of the German Association of Photographers, namely that in terms of image sharpness, depth and their great luminous intensity, the highest levels of performance are ensured".

In advertisements placed not only in the Hamburg newspapers, but also further afield in Germany, Europe and overseas, Krüss could draw attention to the impressive selection of medals that the company's products – "distinguished" in every sense of the word - had been awarded. This series of distinctions had begun at the Exposition Universelle held in Paris in 1855, where Edmund Krüss won a 1st prize with a large barometer manufactured at his workshop. This instrument offered a transferring scale incorporating the very latest technology of that era. By means of an attached clock, it was possible to take barometer readings at specific times.

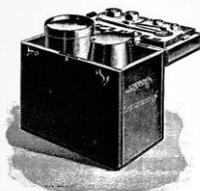
In such advertisements, the company A. Krüss was soon referred to as an optical-mechanical institute. Its premises also incorporated a photographic academy (nowadays referred to as a training centre), which offered "instruction with guaranteed success in all branches of photography given by a skilled photographer". Buyers, too, were given the opportunity on site of testing the photographic instruments developed at the A. Krüss workshop.



23: Calibratable Dutch grain scales manufactured by Krüss

OPTISCHES INSTITUT
 von
A. Krüss.
 Inhaber Dr. Hugo Krüss.

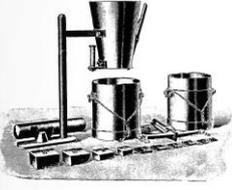
Getreide-Waagen
 nach holländischen Pfunden
 genau den hamburgischen Vorschriften entsprechend
 (Reglement der hamburgischen Commers-Deputation von 1844)
 mit Stempel »Hamburg«.



Getreide-Waagen
 mit Trichter, Gewichten und Streichholz,
 in polirten Kästen.

Kornwaage (Viertel-Kog-Schaale) M. **31.-**
 10 Stück M. **240.-**

Haferwaage (Kog-Schaale) M. **46.-**
 10 Stück M. **370.-**



Getreide-Waagen
 mit Trichter auf Sattiv, Gewichten, Streichholz,
 ohne Kästen.

Kornwaage (Viertel-Kog-Schaale) M. **24.-**
 10 Stück M. **190.-**

Haferwaage (Kog-Schaale) M. **38.-**
 10 Stück M. **290.-**

Getreide-Schrank, polirt, mit Kornschaale,
 Trichter und feiner Waage (Modell der
 Hamburger Handelskammer) M. **140.-**

Getreide-Tisch mit Haferschaale u. Trichter,
 Kornschaale und Trichter, feiner Waage » **250.-**

Preise von Getreidewaagen nach Litermass
 auf Anforderung.

Optisches Institut
 von
A. Krüss
 Inhaber: Dr. Hugo Krüss
 Hamburg
 Adolphsbrücke 7.

24: Advertisement for grain scales in around 1898

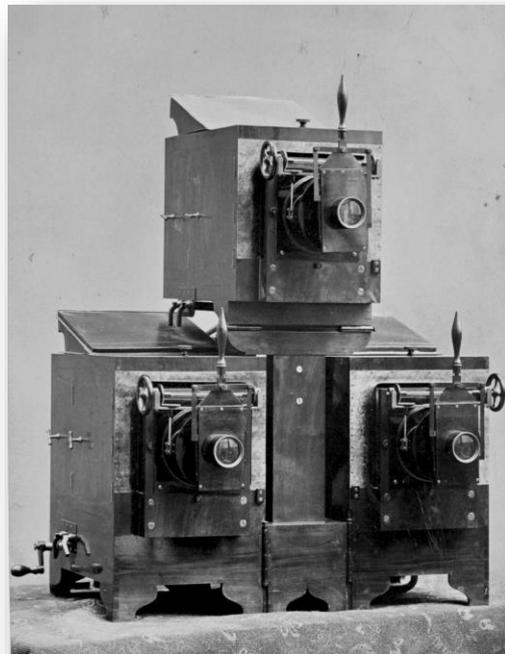


*25: Edmund Johann Krüss, born 30 July 1824, died 30 November 1906
Agathe Auguste Krüss, née Bauer, born 25 February 1829, died 28 May 1912
(Parents of Dr Hugo Krüss, married in 1852)*

The Krüss enterprise earned worldwide acclaim as a manufacturer of large projectors. Better known as “dissolving-view apparatus”, these attracted widespread interest when demonstrated publicly and soon became immensely popular. The optical components of such devices were enhanced so as to obtain the highest luminous intensity. The oxyhydrogen burner generally used as a light source was designed in a manner which not only ensured an exceptional level of luminosity, but absolute safety, too; for the oxygen and hydrogen to be combusted were only mixed after they had already passed through the burner. In those days, the glass pictures required for the projection process had to be imported almost exclusively from France or England. By training staff endowed with the necessary skill, however, it became possible to produce such pictures locally and inexpensively, thereby opening up sales opportunities in all parts of the globe. Together with stereoscopic pictures on glass, images generated photographically were also produced at the studio rented on the corner of the streets Spitalerstrasse and Breitenstrasse.



26: Krüss nebula cameras won awards in London in 1862



27: The sciopticon was a projection device that, in addition to lantern images, could also project objects more brightly due to an oxyhydrogen burner

Achromatische Doppel-Objecte

für
Photographen
von
A. KRÜSS
in
HAMBURG,




prämirt mit der silbernen Ehren-Medaille der Hamburgischen Gesellschaft zur
Beförderung der Künste und nützlichen Gewerbe,
welche ebenfalls zu untenstehenden Original-Preisen bezogen werden können durch
F. Beyrich in Berlin.

**Doppel-Objective für Portraits und Landschaften mit
Conus und grösserer Hinterlinse, ohne
Focus-Differenz.**

Vordere Linse 19'''	hintere Linse 24'''	Bildgrösse 8 Zoll	Pr. ₰ 26
» » 24'''	» » 36'''	» 12 »	» 46
» » 36'''	» » 48'''	» 18 »	» 100

Diese Objective eignen sich namentlich zur Aufnahme von Gruppen, weil
sie besonders tief arbeiten.

Doppel-Objective für Portraits, ohne Focus-Differenz,

für 1/4 Platte, vordere Linse 19'''	hintere Linse 19'''	Pr. ₰ 11
» 1/2 » » 24'''	» » 24'''	» 30
» 1/1 » » 37'''	» » 37'''	» 56
» 15zöll. Bilder, » » 51'''	» » 51'''	» 145
» 20 » » » 60'''	» » 60'''	» 210

**Orthoscopische Doppel-Objective für Landschaften,
Landkarten, Gemälde etc.,**

vordere Linse 18'''	hintere Linse 12'''	Bildgrösse 7''—10''	Pr. ₰ 11
» » 24'''	» » 16'''	» 10''—14''	» 20
» » 36'''	» » 24'''	» 15''—20''	» 40

28: Price list from around 1862



29: Edmund Krüss presents a Petzval lens in 1860

The Patented Krüss Wonder-Camera (Magic Lantern)

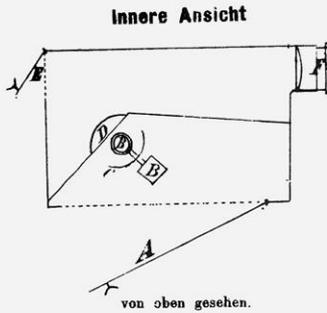
These instruments for the presentation of dissolving views, the agioscopes and their glass pictures of rural, architectonic, humorous and photographed settings, the play with contrasting colours, the collections, the tableaux recording lectures on popular astronomical and geological topics given by pathfinding scientists, all are proof of the unwavering course followed by the two brothers, one which their grandfather Edmund Gabory had already heralded with his lectures. All this was undertaken with the purpose of arousing scientific interest. Discussions were thus conducted in Hamburg on the possibility of founding an institution at which technical and scientific exhibitions of popular interest could be held – similar to the Polytechnic Institution in London that Edmund Krüss had so often visited. Keen interest in the creation of such an institution in Hamburg was shown by one of the city's merchants, Freiherr Ernst von Merck, a strong proponent of causes of general local benefit. Appointed as the Austrian Consul General in Hamburg, he had been elevated to the nobility by Emperor Franz Joseph. At the end of each day, when business closed at the Exchange near Adolfsbrücke, this plan was vigorously debated. In the course of such discussions, however, the question arose as to whether the establishment of a zoological garden would not be of greater importance to the Hamburg population. Unfortunately, therefore, the plans for a polytechnic institute were laid to rest. Expressing no disappointment whatsoever, Edmund Krüss instead contributed as a shareholder towards realisation of Freiherr von Merck's project. After all, this idea had seen the light of day in the house at the Adolfsbrücke. Under its first Director, the renowned Alfred Brehm, the Zoological Garden at Dammtor acquired an outstanding reputation, particularly in the scientific sector. With the opening of Hagenbecks Tierpark, the successor zoo in the district of Stellingen and later model for all worldwide zoological gardens, the vacated site at Dammtor was to become home to Planten un Blomen, the famous Hamburg park landscape.

The field of electric illumination, too, provides evidence of the pioneering spirit with which the Krüss brothers were instilled. In 1857, guests at the Convent Garden, a Hamburg concert and events hall, gazed in awe as a certain Herr Schröder sensationally demonstrated the workings of an electric lamp. By then, however the Krüss brothers themselves had already begun exploring ways in which electric light could be generated with bunsen-cell batteries. They conducted their first experiment in the use of electricity for public lighting: an electric lamp with a reflector was mounted on the roof of a house on the corner of the two streets Bergstraße and Hermannstraße, the light from which was so intense that it was possible to read the "Hamburger Nachrichten" newspaper on the corner of Neuer Jungfernstieg on the other side of the Alster lake. Hamburg's residents turned out in droves to marvel at the proceedings. Street lighting with electricity commenced officially in 1879 when the first arc lamp was installed in the harbour. One year later, eighteen arc lamps were already illuminating the Moorweide park. The "Hamburger Fremdenblatt" newspaper reported as follows:

"Yesterday the gas lighting at Moorweide seemed to shine no brighter than a lowly stable lamp in the dazzling glow of the electric lamps." Similar words had been written in 1845, when gas lighting replaced oil and blubber fuelled lamps.

Constantly at work on new innovations, the Krüss brothers attracted worldwide attention with their magic lantern, the "Wonder Camera". Initially given the unspectacular name "Patent Camera", this instrument was indeed wondrous, as it also enabled the projection of opaque images.

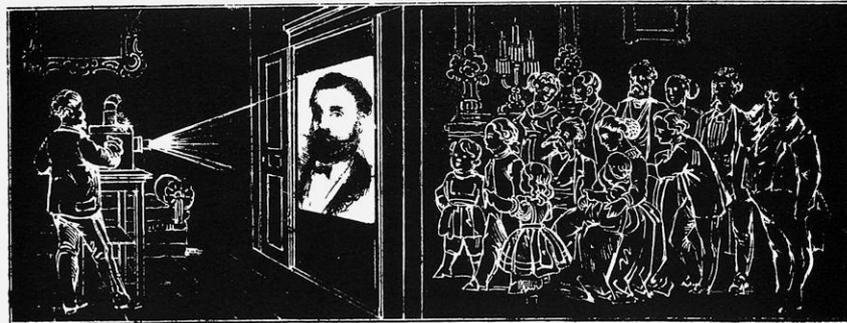
A. Krüss' Patent-Wunder-Camera.



- A. Thür zur Einführung der Lampe
- B. Lampe.
- C. Reflector.
- D. Concentrirungslinse.
- E. Thür zur Aufnahme der zu vergrössernden Gegenstände.
- F. Objectiv.

Gebrauchs-Anweisung.

Die von dem Optiker **A. Krüss** in **Hamburg** erfundene **Wunder-Camera** dient dazu, das Bild undurchsichtiger Gegenstände von der Grösse des im Apparat erzeugten Lichtkreises an eine im Zimmer befindliche weisse Wand zu werfen. Diese wird am Besten in einer Höhe von 5—6 Fuss und Breite von 3—4 Fuss durch weisses Cartonpapier hergestellt, dessen einzelne Bögen man an den Rändern zusammenklebt und mit einigen Stiften auf einen Holzrahmen befestigt. — Von ungleich schönerem Effecte ist es, wenn man auf einen derartigen Holzrahmen mit gewöhnlichem Lampenöl transparent gemachtes weisses Papier spannt und hierauf das Bild reflectirt. Im letzten Falle ist es selbstverständlich, dass der Beschauer nur das transparente Bild erblicken darf, indem die Seite des Papiers, welche dem Apparate zugekehrt ist, das Bild nur sehr matt erscheinen lässt. Es erfordert deshalb einige Uebung, um von dieser Seite durch Hinaus- oder Hereinbewegen des Objectivs das Bild recht scharf einzustellen. Beim Anzünden der Lampe richte man sein Augenmerk darauf, dass sie vorzüglich brenne; dem Beschneiden des Docthes widme man die grösste Sorgfalt und schraube die Flamme so hoch als möglich, nur darf sie nicht russen. (Eine Mischung von $\frac{1}{2}$ Petroleum und $\frac{1}{2}$ Oel giebt ein vorzügliches Licht.) Nachdem dieses geschehen, stellt man den Apparat ca. 6 Fuss entfernt von der weissen Fläche auf und ist es nun erforderlich, das Zimmer vollkommen dunkel zu machen; die Lampe wird jetzt an den im Apparate bezeichneten Platz gebracht und das Bild an der Wand scharf eingestellt, indem man den Auszug des vorn am Apparat befindlichen Objectivs hinaus- oder hereinbewegt. — An der hinteren Fläche der Camera befindet sich eine Thür, welche zur Aufnahme von Visitenkarten oder anderer Bilder dient, jedoch wird auch jeder beliebige Körper, welcher in die Oeffnung der Thür gehalten wird, in starker Vergrösserung an die weisse Fläche geworfen und zwar in seinen natürlichen Farben. Als mit diesem Apparate zu zeigende Gegenstände empfehlen sich vorzugsweise kleine Gemmen, Münzen, Theile des menschlichen Körpers wie Hand, Ohr und namentlich der Mund, Muscheln, Käfer, das Innere einer Taschenuhr, Puppenköpfe, kleine Büsten, Stickereien, Blumen, Mineralien etc. Von Visitenkartenbildern erscheinen Brust- oder Kopfbilder als ganz besonders geeignet; weniger schön solche in ganzer Figur. Photographien jeglicher Art, doch von nicht allzu detaillirter Zeichnung, Holzschnitte, Kupfer- und Stahlstiche auf Carton geklebt, namentlich Portraits für Kinder auch Münchener Bilderbogen und dergl. sind von grossem Effecte.



A. Krüss' Wunder-Camera.

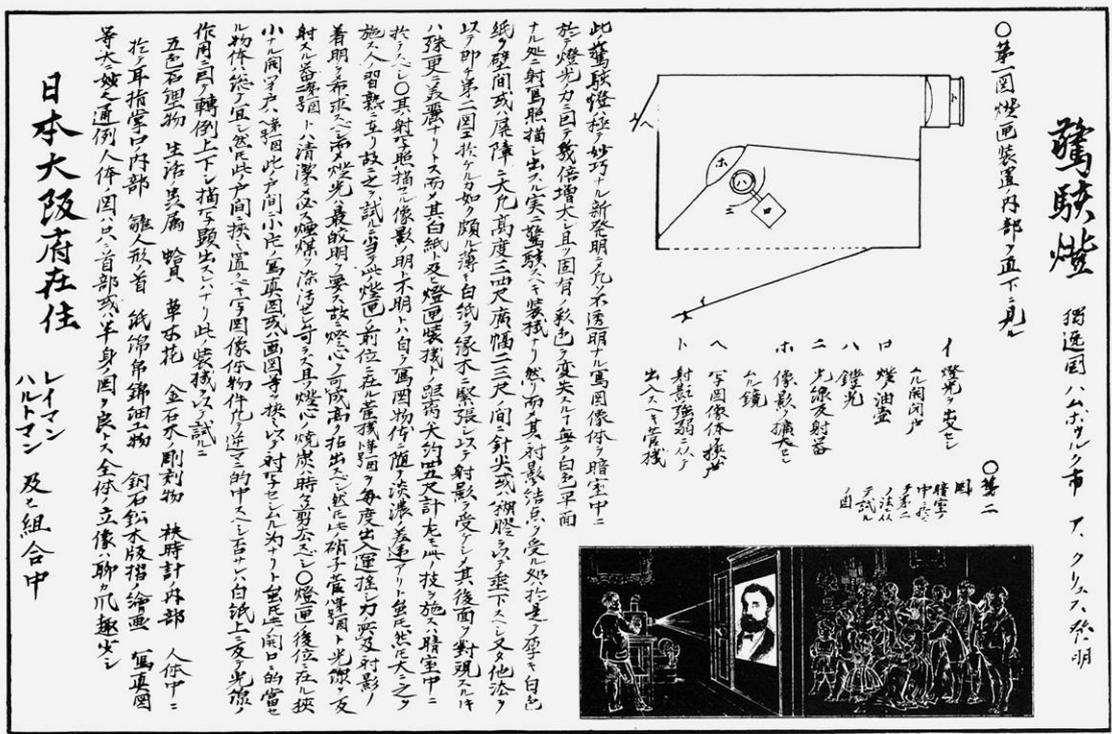


Dieser patentirte, mit der silbernen Medaille prämiirte, von **A. Krüss** erfundene, neue optische Apparat gewährt die Möglichkeit, das vergrösserte Bild von undurchsichtigen Körpern, als Visitenkartenportraits, Büsten, Münzen, Muscheln zc. zc. an eine weisse Wand zu werfen, wodurch die überraschendsten Effecte hervorgebracht werden.

In 3 Qualitäten à 45, 33 u. 24 Mark.
Kiste und Packung für eine Camera
1 Mark 50 Pf.

A. Krüss, Optiker
in **Hamburg**.

30: The patented Krüss Wonder Camera (magic lantern), a predecessor of the episcopo, enjoyed widespread global popularity



31: Operating instructions for the magic lantern translated into Japanese

Developed at the A.Krüss Optical Institute in 1865, the camera was praised by Edmund as follows:

“This new and patented optical instrument which I have designed affords the opportunity of projecting magnified images of opaque materials onto a white wall (screen or backdrop), thus creating the most astounding effects. Objects such as cartes de visite, for example, that is to say photographs as small as a visiting card of heads and torsos that are made to appear larger than life. Portrait busts, coins, shells, the wheel train of a pocket watch and numerous other objects of similar ilk can also be made to appear on the screen in enormous size, seemingly physically and in their natural colours, thus providing an inexhaustible source of pleasure and entertainment for young and old alike.”

To all intents and purposes a predecessor of the episcoper, this so-called “wonder camera” was a simple apparatus, relatively low in price, and initially equipped with an oil lamp. For this reason it soon won widespread popularity. The smaller version cost six thaler coins, the larger one fifteen. Protected by patent in England, France and North America, the “wonder camera” was soon in operation around the globe. Even a Japanese version of the instructions for use was provided. For several years already, the Krüss enterprise had been producing microscopes distinguished by their particularly intense sharpness and luminosity. Experts such as Hofrat Professor Dr A. Wagner, a privy councillor in Göttingen, confirmed their high precision craftsmanship. The mid- 1860s saw the design of a special model trichinella microscope. Edmund Krüss himself undertook frequent examination of trichinella-infected meat. The rules subsequently created were published in Hamburg’s daily newspapers. Also of importance in the neighbouring agricultural states or nations, they complied fully with the requirements of the then effective regulation on the control of trichinosis.



32: Magic lantern produced by A. Krüss from around 1865 (collector's value today approx. DM 6000,-)



33: Trademark of the company A. Krüss/Hamburg



A n w e n d u n g der **Krüss'schen**

Wunder-Camera zum Zeichnen.

Unter den vielfachen unterhaltenden und nützlichen Anwendungen der **Wunder-Camera** möge an dieser Stelle die Möglichkeit, die sie Jedem, auch dem im Zeichnen Unbewanderten, gewährt, das Bild z. B. eines Visitenkartenportraits etc., selbst lebensgross, in frappanter Aehnlichkeit herzustellen, Erwähnung finden.

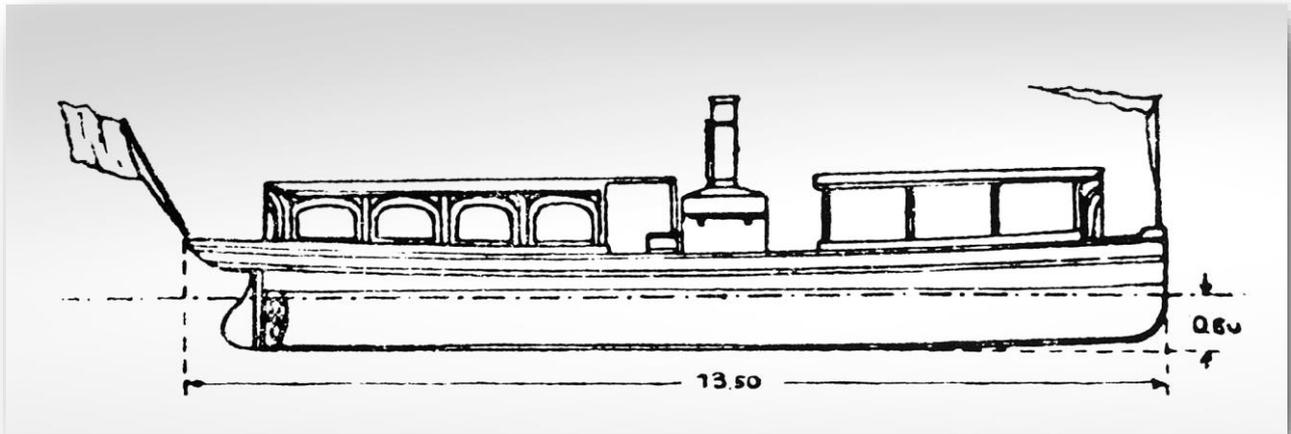
Für Portraitmaler ist es oft von unendlichem Vortheil, die richtig vergrösserten Conturen einer photographischen Visitkarte auf die Leinwand übertragen zu können, wie auch unter Anderem diese Methode sehr zu empfehlen ist, wenn eine grössere Kreidezeichnung oder ein Oelbild von einer **verstorbenen** Persönlichkeit nach einem kleinen Bilde angefertigt werden soll. Dass überhaupt diese Art und Weise zu zeichnen ferner eine ausserordentlich gute Uebung ist, dafür liegen die übereinstimmenden Urtheile kompetenter Zeichenlehrer vor.

Das Verfahren ist folgendes:

Man hefte einen Bogen weissen Papiers mittelst Heftzwecken an die Wand eines dunklen Zimmers, setze die Camera in Stand und lasse jetzt das Bild auf diesen Papierbogen reflectiren; die Entfernung der Camera von dem Papiere bestimmt die Vergrösserung, und zwar in sofern als: je näher, desto kleiner, je weiter ab, desto grösser das Bild erscheint. Nachdem dieses geschehen, fahre man mit weicher schwarzer Kreide die Umrisse des reflectirenden Bildes auf dem weissen Papiere nach und gebe so viel als möglich die Schattirungen an. Von Zeit zu Zeit revidire man die Zeichnung, indem man das Licht einer Kerze darauf fallen lässt, um zu sehen, wie weit man gekommen und ob man auch keine Linien überschlagen habe. Ist man mit dieser Procedur fertig, so nehme man die Zeichnung, welche als Spiegelbild erscheint, von der Wand, lege sie auf einen Bogen Carton oder starken Papiers, doch so, dass sie diesen berührt, und reibe die Rückseite der Zeichnung mit einem Falzbein, wodurch man auf dem darunter liegenden Papiere oder dem Carton einen Abdruck erhält, welcher das Bild richtig zeigt; hierauf kann man diesen Abdruck mit Bleistift, Kreide oder in Farben je nach Fähigkeit und Wunsch des Zeichners weiter ausführen.

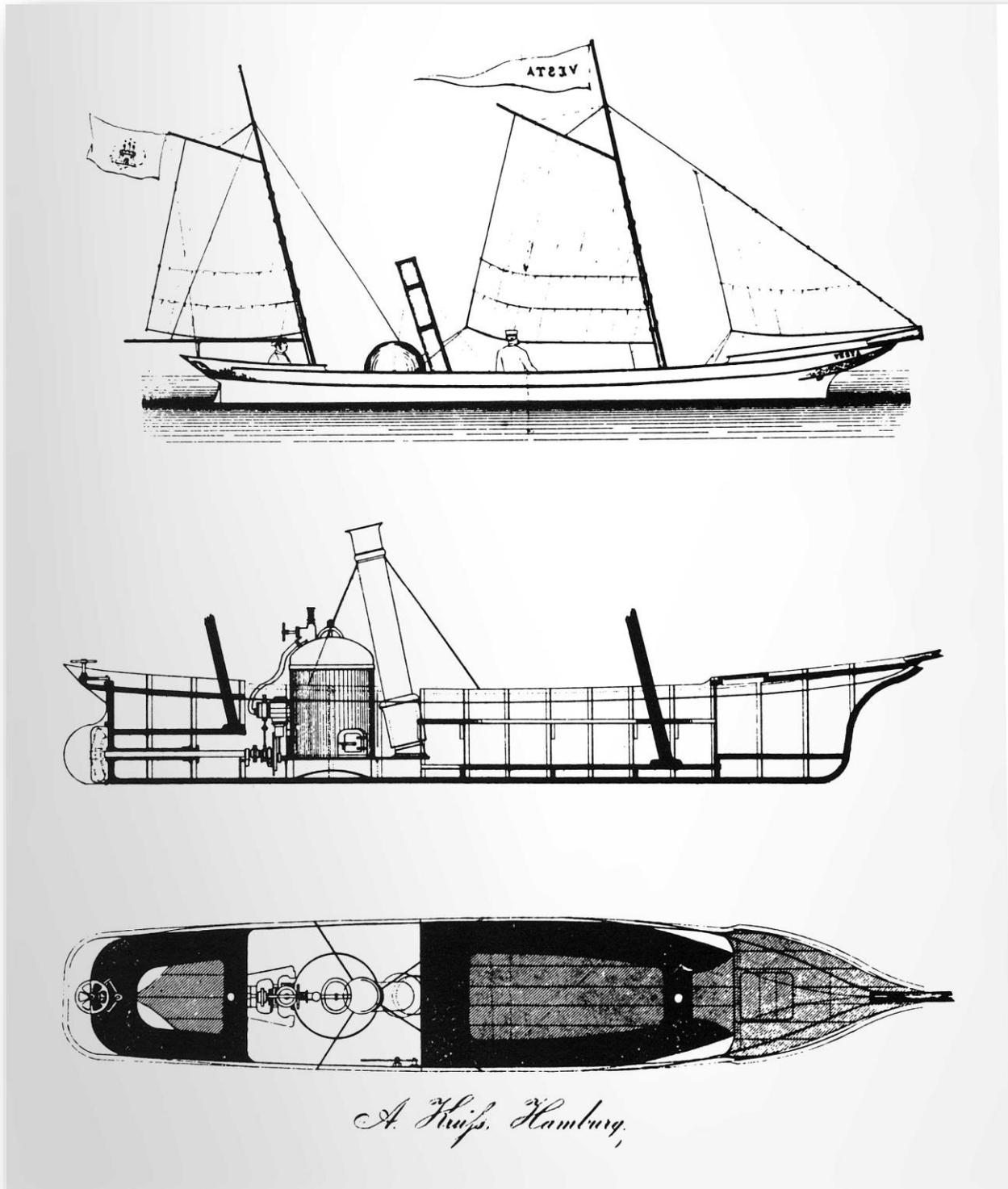
A. Krüss.

34: The patented Krüss Wonder Camera (magic lantern), a predecessor of the episcopo, enjoyed widespread global popularity

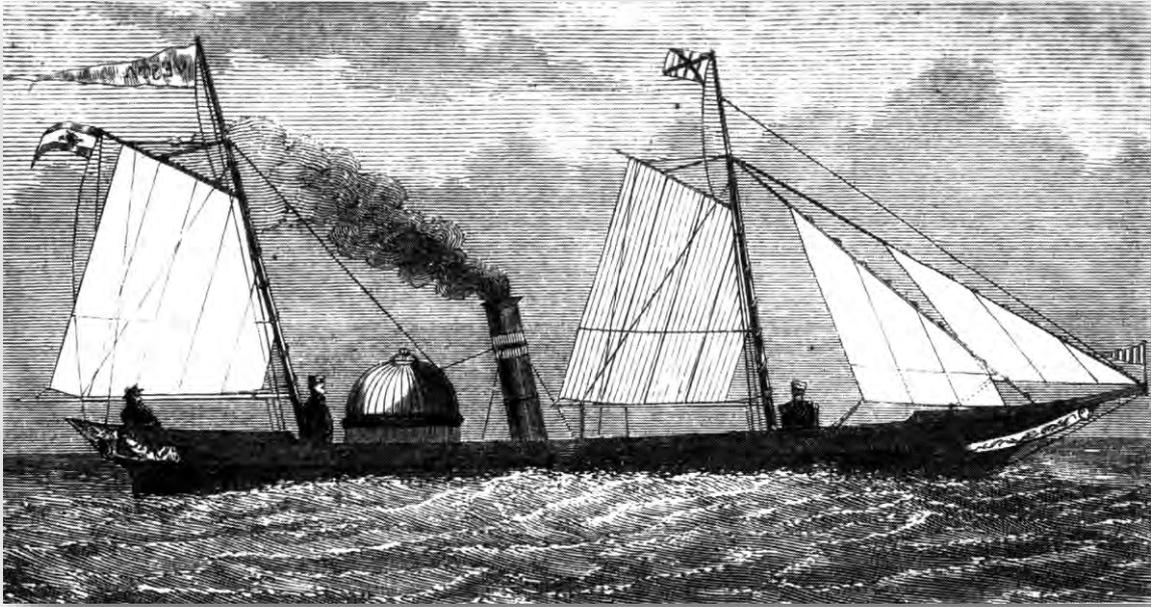


35: General plan of the Alster screw steamer *Alina* drawn by the builder A. Ferber, Technical Director at the Reiherstieg shipyard, showing the vertically installed Krüss steam boiler

An extraordinary order marked the beginning of a new construction programme that could have led to lasting re-alignment of the company's traditional scope of activity. A relatively large model steamboat was to be built for the Prince of Siam. On completion of this task, the Krüss brothers were inspired to commence the construction of small steamboats fitted with vertically installed steam boilers and suitable for the conveyance of passengers. The necessary expertise had long since been acquired through the construction of model rail locomotives. The boats were built at the Janssen & Schmilinsky shipyard on the isle Steinwerder. Not only did these small vessels find a ready market in Hamburg and the nearby coastal regions, for sales also flourished abroad, especially in Sweden and Norway. Some were even exported to Siberia. Measuring 30 and 40 feet in length, these boats could accommodate 30 and 50 persons respectively. Fitted with a 2 hp engine, the smaller version could travel at a speed of seven English miles per hour and cost 1,250 talers. Great interest was again shown by Freiherr von Merck, who believed that such vessels would be ideally suited for passenger transport on the River Alster and its lakes. He also offered his assistance in the process of obtaining a licence. For whatever reasons, however, this plan came to nothing. The first passenger vessels across or along the Alster nonetheless included two steamboats that were quite clearly identical to those built by the Krüss company in collaboration with the shipyard on Steinwerder. After an initial attempt at providing such a service with paddlewheel steamers had floundered in every sense of the word – brought from the River Rhine, the first such vessel already sank during its trip along the Elbe, the second almost causing the Lombard Bridge to collapse – the first Alster steamboat was constructed at the Reiherstieg shipyard, soon to be followed by a sister vessel. But boats 3 and 4 were launched at the Janssen & Schmilinsky facility and had upright boilers. In 1860, they entered into successful competition with the first two Alster vessels, were painted green and operated by the "Vereinigte Alsterschiffer", an association of licensed ferrymen and boat rental enterprises. Passengers travelling on these boats who wished to pass from the Aussenalster, the larger of the two Alster lakes, into the Binnenalster, its smaller sibling, were obliged to pay duty, for the city was a customs exclave – and later Free Port – with the wooden Lombard Bridge then serving as customs boundary. The next generation of ships to provide passenger services on the River Alster and its two lakes were fitted with a horizontal boiler, which could be operated and cleaned more easily and conveniently – all at greatly reduced noise levels.



36: In around 1859, the Krüss brothers designed small steamboats which were then built at the Janssen & Schmilinsky shipyard



37: Screw steamship built by A. Krüss in 1859

Back in those days one or other of the company-built steamboats was often berthed on the canal alongside the Krüss business premises and used for excursions along the Elbe, particularly by the adventurous brother William. The record of an especially eventful trip has survived the passage of time. William provided full details in a letter sent to Edmund, then taking a health cure in the spa town Bad Ems. The following excerpts from the letter which describe the excursion taken on Whit Monday 1862 accurately reflect that period in the lives of the Krüss brothers and the circle of friends with whom they associated. Following the trip to the isle Steinwerder already undertaken on Whit Sunday, a longer excursion was planned for the second feast day, this time along the River Este to the town of Buxtehude. The group of relatives and friends were joined on board by a crew of two engineers and the river pilot. A first mishap soon occurred – the fire went out persistently as the wood was too wet – followed by a second, when the vessel was unable to proceed much further than the factory perimeter: hardly budging another inch, the steamboat simply refused to co-operate. Wearing a captain's hat with gold braiding – actually the cavalry cap that he had adapted to suit the occasion – William inspected the engine, couplings and roller bearings, but nothing was amiss. Only the propellor could therefore be the cause of the problem.

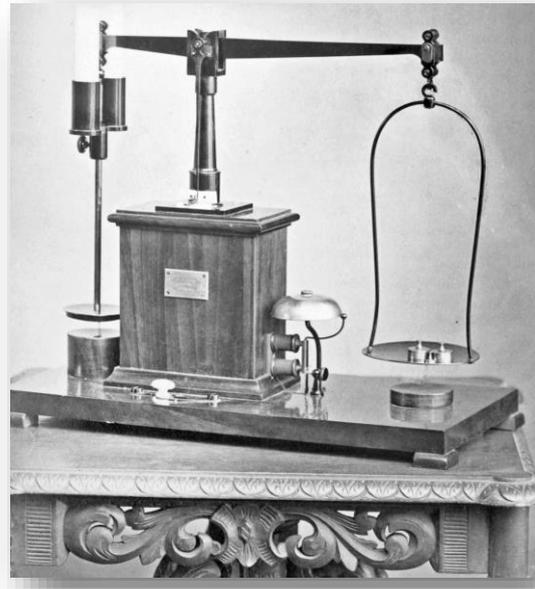
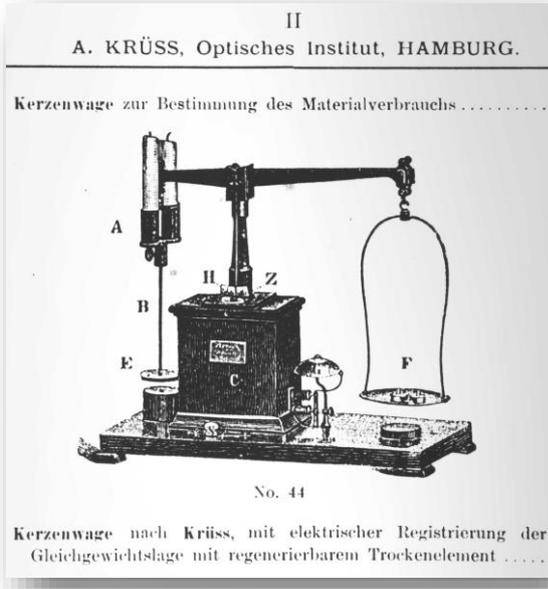
Let us leave further explanation to William: *“As the boat was scarcely moving, I allowed it to come to a standstill and dropped anchor. The assistance of a man with a skiff could soon be obtained; in this I seated myself and requested that all passengers move to the bow of the steamboat. I was thus able to inspect the condition of my propellor, only to discover that such a mass of wood shavings had wrapped themselves around the scallywag that it was no longer able to turn. When these shavings had been removed, however, the trip swiftly proceeded as foreseen”*.

If the stir caused when the tiny boat steamed into the port at great speed, its distinctive whistle drawing curious sailors from their “hiding places” out onto the now bustling ship decks, had already constituted an event, the arrival of the steamer in the Altes Land region was to be remembered as a sensation by the local population.

As the boat sailed up the River Este, normally the exclusive domain of freight barges, inquisitive eyes peered from all along the embankment. The cheerful group enjoyed their trip along the Elste with its “delightful riverbanks”, spent pleasant hours in Buxtehude, where lunch was taken at the Schützenhaus, the clubhouse of the local marksmen’s association. The sights of the town were then admired, everyone on the lookout for those mysterious dogs which, as the well-known legend has it, are able to “bark with their tails”. Following further merriment and dancing, the jolly throng once again boarded their vessel – observed by half of Buxtehude:

“The imbecilic vintner held an even more imbecilic speech before the assembled locals, at the end of which three raucous cheers were given in praise of Buxtehude, we shouted hurrah, the locals yelled, accompanied by intermittent hooting from our steam whistle. The engine was set in motion and in next to no time we had left Buxtehude and the eyes of its inhabitants far behind us. The hurrahing was repeated in all the other villages that we passed. When we were half way down the Elste, however, the heavens opened their floodgates and a fierce wind arose. My pressure gauge now indicating 30 pounds (per square inch), and exposed as we were to wind and water, I went below deck to heat the boiler up to a level of 64 pounds. We had attained this pressure by the time we left the Elste, from whence, continuing our journey at great speed, we ploughed the waves of the Elbe, over a mile wide at this point. Now of all times, a crack occurred on my water gauge, a potentially fatal co-incidence given that the heavy downpour of rain seriously impeded our vision, making it impossible to replace the damaged instrument. Against the odds, however, the gauge held until we reached St. Pauli, where it shattered completely. I immediately applied the water pump so as to ensure that my boiler water remained at the required level, and we were thus able to return to Steinwerder safe and sound”.

The rest can be summed up briefly: The merry company had noticed next to nothing of the troubles confronting William, who throughout had remained completely sober and in control. They enjoyed the hours on board enormously, and William, as their “captain”, had to exert his full authority in ensuring that no-one fell overboard. The noticeable discomfort of the ladies was due less to the excellent wine they had imbibed than to the inclement weather conditions. No horse-drawn cab being available on their arrival, and despite their sorry appearance, they were subjected to the jeering of the mischievous young rascals now on their heels. A Whitsun back in 1862! And one to remember! For the Krüss brothers, professional and private life went hand in hand. A self-constructed miniature railway locomotive chuffed and puffed around the large property in Bergedorf which they had purchased in 1857 and resold four years later in order to acquire a new and equally large plot of land on Hoheluft-Chaussee close to Kätnerkamp – a street now named Gärtnerstraße. Here Edmund built himself a summer villa; William - who later moved to Schöne Aussicht - a house with stables that was also suitable for winter residency. This in itself confirms that, in financial matters, things were running well for the Krüss brothers. And yet, although they lived in relative prosperity, the prevailing circumstances at that time must also be taken into consideration. Thrift and moderation determined the life of the everyday citizen. The accuracy with which expenses incurred at the home of Edmund Krüss were recorded is confirmed in the ledger of expenses meticulously kept by the head of the family. Between 1853 and 1884, each and every expense was recorded, whether for housekeeping in general, or simply for cigars. Only from 1857 onwards was Agathe Krüss granted a certain sum of money for “sundry expenses”, in other words for personal use. A tally was kept of each major item that she purchased. Hugo, the firstborn son, refers to the thrift and moderation of his parents in a series of reports on the lives of family members past and present, including those of his grandparents and great grandparents. Which brings us to the children. Three sons were born to this more than happily married couple: Hugo in 1853, Edmund in 1855 and Gerhard Alexander, the youngest, in 1859.



38: Candle scales from around 1847
Excerpt from the Krüss general catalogue

39: Krüss candle scales with electrical registration and drying element

Monat	Januar	Febr.	März	April	Mai	Juni	Juli	Aug.	Sept.	Oktober	Nov.	Dez.	Jahressumme	1875	1876	1877	1878	1879	1880	1881	1882	1883	1884																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
1653	1633	118.8	266.8	295	600	44.6	353.8	155.6	326.4	180	14.8	52	43.8	37	38	18.12	70.6	4026.5	1854	1693.8	117.8	188.6	369	575	101	55.6	67.4	219.4	128.13	195	13.13	28	17.4	38	39.7	26.8	2.8	39.12	3916.5	1855	1558.3	111.8	183	395	550	170	42.15	44.7	225.12	166	15.14	49.10	28.8	49.10	10	7.8	31.2	36.2.8	3621.8	1856	2034.14	134.19	247.8	385	550	212.7	32.10	154.11	180.2	62.14	225	18.12	66.8	37	11.8	7	2.8	38.14	4421.8	1857	2182	73	314.5	247.14	69.82	143.98	575	33.10	279.7	151	202.13	246	7.6	57.13	27.13	30	7	7.8	60.4	53.13	4935.14	1858	1875	8.12	357.6	353.5	163.10	85	600	33.9	117.1	162.1	441.4	246	11.9	70.8	28	38	6.14	2.8	61.7	669.14	1859	3300	81.14	153.14	427.1	600	536.14	89.8	419.7	126	240	15.9	14.8	76.2	64	8	12.8	25	15	15	15	5814.14	1860	3425	102.13	319.2	273.13	263.2	326.15	600	34.3	152.3	188.4	271.10	810	270	15.14	25	12	10	24.6	10	66.3	6324.8	1861	2720	18.8	238.2	444.6	374.6	141.4	600	556.7	140.11	88.9	210.3	564.9	240	42.4	18.6	43.12	4.4	43.4	41.8	6613.8	1862	2470	12.8	294.102	209.3	453.8	157.7	600	574.13	122.8	39.8	171.4	340.7	180	44.8	47.8	53.12	8	35	66.10	53	15	15	15	7169	1863	2860.9	3.4	320.8	850.3	602.7	164.7	600	994.12	174.8	99	815.9	160.1	270	59.12	94.11	43.12	8	45	75.15	29	15	15	7075	1864	2435	19	344.15	348.10	812.7	161.7	600	994.12	174.8	99	815.9	160.1	270	59.12	94.11	43.12	8	45	75.15	29	15	15	7075	1865	2756.15	20	394.8	352.52	951.12	130.14	600	1065.6	174.3	324.3	180.13	638.6	330	83.9	73.10	63.8	8	8	12.8	101.13	3229.14	1866	2754.16	12	322.9	441.6	65.9	600	1042.2	1403.9	153.4	402.3	335	12.12	73.14	65.2	33.8	8	8	8	12.8	87.12	3433.14	1867	2922.1	16	326.2	421.11	1251.4	114.1	600	1090.2	444.14	814	385.12	329.10	245	115	64.14	71.4	8	17.8	26.6	3305.10	1868	2922.7	26.8	322.5	644.7	1174.4	96.13	600	1066.2	422.13	317.4	220.6	562.15	330	124.9	107.10	61.12	20.8	32	63.6	63.15	3522	1869	3044.7	16.8	222.6	337.52	1624.4	42.2	600	1323.4	575.7	155.3	361.12	31.4	215	152.12	46	37.8	42.12	8	25.6	53.3	9745.14	1870	3229.14	34.13	155.5	222.6	1721	65.12	600	1624.5	626.4	316.2	144.1	330	177.3	330	177.3	67.13	60	56	8	233.11	79.15	10092.8	1871	3708.2	219	329.4	676.1	2434.7	59.6	850	1213.3	624.9	143.10	435.9	1162.4	315	174.5	77	70	12	8	90.4	112.12	12770.2	1872	2971.2	32	322.14	501.7	2126.10	189.3	1000	1160.9	609.11	157	364.2	916	320	169.5	50	60	47.12	32	127	17.9	53	1202.4	1873	3225.2	32	322.14	501.7	2126.10	189.3	1000	1160.9	609.11	157	364.2	916	320	169.5	50	60	47.12	32	127	17.9	53	1202.4	1874	3228.2	9	274.10	578.10	2483.14	149.7	1000	1416.15	691.2	443.1	322.1	1122.4	320	189.9	77	70	12	8	61	72	15	15	43024.12	1875	5075.5	150.85	353.61	522.12	1777.81	37.23	1200	2220.30	712.50	1431.10	566.63	220.22	720	208.83	81.52	51	105.30	30	383.30	113.64	4623.14	1876	2472.8	129	340.10	521.44	3226.06	163.57	1200	2098.20	693.75	326.09	662.38	654.20	540	276.75	123.65	73.50	976.15	40	207.50	67.25	1712.20	1877	2467.10	121.15	322.09	706.16	2955.6	106.05	1200	2560.99	721.50	181.60	1622.01	150.40	450	224.60	168.50	63	1194.60	20	271	154.15	153.30	1573.99	1878	3245.10	75.55	341.30	516.58	2649.14	115.97	1200	3317.24	801.20	605	724.59	2020.26	260	182.35	106.05	62	140.20	149.61	241.53	271.70	4666.66	1879	3423.14	71.75	364.65	445.34	2664.20	17.24	1200	2275.76	851.53	393.35	955.42	1920.35	270	115.50	148.25	60	30.40	15	258	95.50	4063.70	1880	3275.2	32	323.30	537.10	6728.22	119.29	2032.23	1733	837.75	915.10	161024.95	1829.85	510	143.57	129.50	59	32	125.70	41.70	33149.22	1881	4611.10	49.75	323.35	372.65	2567.80	38.75	3050.95	1840.57	1115.50	1167.05	693.40	1645.60	450	143.57	129.50	59	32	125.70	41.70	33149.22	1882	3242.15	122.50	399.40	597.11	176.0	73.21	3093.85	2055.65	1101	1762.63	854.98	1445.60	450	143.57	129.50	59	32	125.70	41.70	33149.22	1883	3358.15	134.50	365.40	735.50	492.40	65.60	3320.65	1954.90	1076.68	564.10	1177.70	2104.05	270	128.35	40	161.40	63	130.05	10	241.30	113.10	2379	21823.88	1884	4222.21	—	371.55	776.35	221.21	150.87	3095.70	1562.31	774.25	222.35	1443.38	2202.85	270	128.35	40	161.40	63	130.05	10	241.30	113.10	2379	19916.15

40: Entries in the private account of Edmund Johann Krüss, 1853-1884 (back then, as now, rising prices were also far from uncommon)

The entrepreneurial couple Agathe and Edmund Krüss

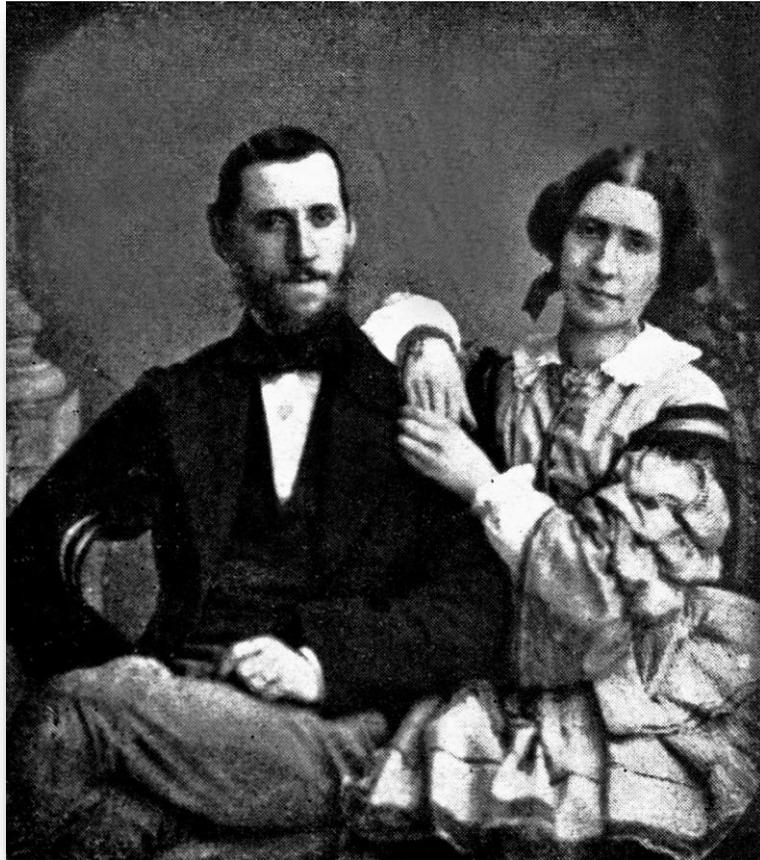
Hugo – the future Professor Dr Hugo Krüss – portrays his father as an ambitious man who, weighing the pros and cons of the issue at hand, constantly strove to fulfil his duties with integrity, a man of the world and upholder of his Hanseatic heritage.

“Virtues truly befitting of a Hamburg citizen, those pioneering envoys of the German spirit that can be found on all the trading routes traversing our globe”.

Wherever in the world he travelled, Edmund Krüss quickly felt at home. He possessed a talent for foreign languages - those of Scandinavia, even the Romanic tongues – and, following family tradition, spoke fluent English as a matter of course. Indeed, with his lean figure and exceptional knowledge of English, he was often mistaken for an Englishman. The language skills he had acquired also served him well during the journeys he made both professionally or privately. Financed exclusively from an own budget, these journeys greatly benefitted both enterprise and family. How difficult it is to convey an understanding of all this to our present generation, accustomed to obtaining information on any current event or issue in a particular field via the modern media. In those bygone days, most information was conveyed direct from person to person, technical progress best accomplished through physical scrutiny of the objects in question. Whether in the workshop or at the family table, fresh findings and results were discussed in detail. From an early age, therefore, the sons also gained sound and useful knowledge. Agathe Krüss often accompanied her husband on his journeys. Together they travelled to France, Italy, Austria and Switzerland, very often to England, and even undertook a sea voyage to the North Cape of Norway. Due to the fluctuating state of his health, Edmund often visited spa resorts for treatment, initially in Bad Ems, and later, on an annual basis, in Wildbad together with his wife. She was the perfect companion and partner in the life of her husband. Their son Sohn Hugo described the marriage of his parents as “happiness blessed with the brightest sunshine”. Camaraderie, mirth and a love of dancing were essential components of their life together, particularly in younger years, and they shared many a happy hour with other youthful members of the “Club der Wahnsinnigen Häringe” - literally “crazy herrings” - a Hamburg association devoted to jollity and merriment. These friendships were to last a lifetime.

One delightful little story tells us much about the humorous temperament of Agathe Krüss: Disguised as a maidservant, she managed to sneak into the exclusively male club from which women had hitherto been barred, thus breaking a longstanding taboo. Ladies now also being admitted, the club became a place of cheerful companionship, especially, it appears, when hosting the festivities occasioned by the baptism of the third Krüss son.

As a respectable citizen Edmund Krüss took his duties extremely seriously. For over half a century he was a member of the “Patriotic Society”, Germany’s oldest civic organisation, in which he held a wide variety of offices. Founded in 1765, this organisation saw it as their main responsibility to promote the arts, sciences, trades and social institutions, and thus to serve the welfare of the community. As early as 1767, the institution which saw itself as “the social conscience of the city” had already set up training classes for young tradesmen, a foundation on which the later vocational trade-school system was built. Edmund Krüss was also First Chairman of the technical commission established as a section of the Patriotic Society. Thanks to his efforts, this commission was transformed into an independent trade association which, from 1888 onwards, enjoyed a flourishing development. In 1868 the Patriotic Society set up a committee with the purpose of initiating preparatory steps for the creation of an industrial museum. As a senior committee member, Edmund Krüss contributed enormously to the achievement of this objective.



41: Edmund and Agathe Auguste Krüss, née Bauer, in approx. 1860, married on 16 May 1852 at the Church of St Jacobi

1856		1857	
Januar	2034 11.	Januar	2180 -
Februar	1314 12.	Februar	73 -
C. Krüss Klavier	247 8.	C. D. Krüss Klavier	314 5.
Agathe Krüss Kasse (Kasse)	385 -	Agathe Krüss Kasse (Kasse)	400 -
Maria Krüss Kasse (Kasse)	458 -	Maria Krüss Kasse (Kasse)	575 -
Wanann, W. Krüss Kasse	762 7.	Wanann, W. Krüss Kasse	138 10.
Wanann, W. Krüss Kasse	32 10.	Wanann, W. Krüss Kasse	338 10.
Wanann, W. Krüss Kasse	174 11.	Wanann, W. Krüss Kasse	279 7.
Wanann, W. Krüss Kasse	180 2.	Wanann, W. Krüss Kasse	151 -
Wanann, W. Krüss Kasse	62 14.	Wanann, W. Krüss Kasse	404 13.
Wanann, W. Krüss Kasse	225 -	Wanann, W. Krüss Kasse	216 -
Wanann, W. Krüss Kasse	133 7.	Wanann, W. Krüss Kasse	134 11.
Wanann, W. Krüss Kasse	48 6.	Wanann, W. Krüss Kasse	128 9.
Summe	14431 8.	Summe	14985 10.

42: Excerpt from the budget book kept by Agathe Krüss (1856 and 1857)



43: *In Hamburg, the PATRIOTIC SOCIETY represents the best developed example of a civic organisation of private individuals committed to working for the common good. It has always seen itself as the social conscience of the city. A member of the society for over 50 years, Edmund Krüss intermittently served as its First Chairman*

He devoted himself wholeheartedly to this task - in the course of which he discovered a true friend in the young Justus Brinckmann - until the collections assembled by the Patriotic Society could finally be presented to the state prior to inauguration of the Hamburg Museum of Arts and Crafts, today's MKG, in 1877. Edmund Krüss was also a founding member of the local arts and crafts association. It would burst the framework of this chronicle to list all of the honorary offices and duties with which he was entrusted. The Patriotic Society, in which he served as senior chairman for two years, awarded him the highest distinction it could possibly grant: he was appointed as the senior elder of the institution. Time after time Edmund Krüss was called upon to serve in commissions which organised industry and trades exhibitions. For twenty years he held an appointment as authorised expert consultant for the Hamburg Chamber of Precision and Optical Engineering. He was thus actively involved in a series of offices and administrations that, benefitting from his wide expertise, could simultaneously provide him with fresh knowledge and inspiration to spur on his own professional undertakings.

As a conscientious Hamburg citizen for whom a democratic state of government took absolute priority, Edmund Krüss was held in such high esteem by his peers that he was entrusted with the prestigious office of a civic tax appraiser, which ultimately won him a seat in the Bürgerschaft, Hamburg's local parliament. Through this activity he was appointed to serve in the central election committee, which monitored the local and general elections that determined the composition not only of Hamburg's city parliament, but also of the Reichstag, Germany's central seat of government. In recognition of the services he had performed for his native city, Edmund Krüss was presented with two golden Portugalese medals by the Hamburg Senate.

Taking account of the innumerable honorary duties undertaken by Edmund Krüss, also for the Church and in the social sector, it is amazing, in hindsight, that any time at all was left for him to conduct his professional activities. Considering, too, that he was never one to make a decision easily, preferring instead to weigh the options meticulously, these numerous auxiliary duties must have taken a heavy toll on his working energy.

And yet the enterprise at Adolfsbrücke continued to flourish. In 1874, when William Krüss resigned from the business, his brother Edmund, now its sole owner, was joined by his eldest son Hugo. A further milestone occurred in 1886 when A. Krüss took over the optical business of Edmund Gabory, who had decided to close his company for personal reasons. This step was taken amicably in unwavering friendship and familial solidarity. The merger was announced in a jointly drafted statement.

Edmund Krüss promised "to uphold the excellent reputation of the Gabory enterprise and furthermore to meet the highest standards of quality, no matter how demanding, that may justifiably be expected from a first class optical institute . . ."

The two companies that had been separated in 1844 were thus reunited under one and the same roof.



45: An award granted to the Krüss enterprise at an exhibition held in Rome in 1904

Tradition and Progress

In 1888, the “Year of the three Emperors”, Edmund Krüss handed over the reins of the flourishing company to his son Hugo. Constantly aware of the dramatic technological developments and advances in the scientific field during his fruitful working life, the father had successfully incorporated them within his own business and thus gained repute and acknowledgement not only in Hamburg and Germany, but also in places farther afield, particularly overseas. Endowed with exceptionally versatile talents and tireless assiduity, his son, the later Professor Dr Hugo Krüss, now stood at the helm, a man who, whilst continuing to successfully manage and expand the family enterprise, also placed his outstanding knowledge and experience at the service of the public sector. Clear evidence of the boundless devotion Hugo showed towards his family and business is already provided by the memoirs in which, down to the tiniest detail, he recorded all that impressed him even as a child. Without the aid of this printed documentation, it would now be impossible to chronicle the history of the Krüss family and business in such accurate detail.

Instilled with such a strong sense of family ties, the Krüss men and women have always been keen to put pen to paper. As Fate has remained gracious, most of the memoirs, documents and photographs amassed over the passage of time have been preserved for posterity. Not only does professional achievement thus obtain the recognition it justly deserves, for a seamless and vividly transparent portrayal of the lives and characters of each generation of the Krüss family can also be presented. The three sons of Edmund and Agathe Krüss enjoyed a carefree childhood, nonetheless fully observant of the world around them, the company business in particular. As Hugo, the eldest son born on the 23rd of February 1853, appears to have been a somewhat frail child, he was already taken by his parents to Haffkrug at the Baltic Sea in the summer of his very first year. The memoirs he published under the title “About my Ancestors” contain a chapter which portrays his young parents:

“When I was but a few weeks old, Father’s brother became infected with scarlet fever, so that, without further ado, I was bundled off to my Grandmother Bauer. Years later, she continued to pride herself on the great favour she had afforded me whilst in her care of tweaking out the tiny nose with which I had been born.”

Indeed, later photos taken of Professor Dr Hugo Krüss, Dr h.c., reveal a noticeably prominent, by no means underdeveloped nose. Grandmother Bauer seems to have tweaked quite vigorously. This account may possibly provide a first hint of a characteristic that Hugo also displayed in later life, especially evident in those situations when he was obliged to project his personality fully to the fore: his humour and brilliantly witty comments, whatever the situation.

Happy years were spent in the house at the Adolfsbrücke, but, above all, at the family properties on the outskirts of the city. These included the house in Bergedorf, home to the previously described self-built steam locomotive and a large telescope through which the father could reveal the starlit sky to his sons. The blissful time in Bergedorf was not to last for long, however, in no small measure a result of the long, rather arduous trip to and back from Hamburg, especially for the children who, after all, were obliged to attend school regularly. This was strictly ensured by the parents.

Following the sale of the country house in Bergedorf, the family acquired the already mentioned property in the Hoheluft district, close to what is now the street Gärtnerstraße.



46: *Agathe Auguste Krüss, née. Bauer, with her son Hugo Krüss in around 1865*



47: The house of Edmund Krüss and family, Hoheluftchaussee, Neue Gärtner Straße, in approx. 1862, surrounded by fields and meadows.

From here he set off on foot to the city and later, in unfavourable weather, on the horse-drawn omnibus

Located amidst fields, meadows and hedgerows, even incorporating a large hall, the new and spacious family home of 1862 provided the boys with a delightful paradise of fun and play. A setting, too, in which the father installed a largish telescope through which he allowed the youngsters to observe the night-time sky, using a celestial chart to explain the myriad of details to them. The three boys could not have wished for a better teacher than their father.

The road into the city was almost always covered on foot. Only in extremely inclement weather was the omnibus taken, a service which departed from Lokstedt. On their way home from school, the boys would often run alongside the omnibus and attempt to overtake it. Back in those days, of course, such vehicles were still drawn by horses, for whom, to say the least, the trot along cobblestoned and sandy paths was a laborious and cumbersome task.

Without fail, the whole family would undertake a regular Sunday walk. As noted in Hugo's memoirs:

"In winter, these walks were far from lengthy; we simply cajoled our mother long enough until, finally, my father would lead us all into Giavanoli's Alstereck patisserie at the corner of Neuer Jungfernstieg and Gänsemarkt. What immense pleasure it always was to enjoy a delicious cup of hot chocolate, seated at the window through which we could observe the hustle and bustle taking place along Jungfernstieg. With the onset of spring, early excursions were made at breakfast time. To Teufelsbrück, to the bakery in Niendorf and the restaurant 'Zum Jäger' in Groß Borstel".

The Krüss household lived well, if somewhat frugally. *"In accordance with the then common custom, we children ate our bread without butter. The necessary fat was replaced with helpings of cod liver oil, a far from popular alternative for us. My father would arrive home quite exhausted at mealtimes. Thus we children had to remain as quiet as mice at table"*.

As documented by Hugo Krüss in his memoirs. And yet, in her own childhood recollections, Hugo's daughter reveals the following: *"When my father was a child, only Grandfather was served dessert, whilst his sons were left to sit back and watch. In later years, however, Father caught up on that which had been denied him in his younger years."*

And, all things considered, he did not come off badly. As a father, Edmund seems to have been rather strict, not one to express praise lightly, unlike the boys' mother, who, warm-hearted and serene in temperament, would make up for everything. *"Beloved mother is the source of my cheerful spirit..."* Here too, as so often the case in families during those far off times, these words by Goethe impart their full meaning. What a wonderful memorial to their mothers was thus created by children back then! And yet – let us not forget the cod-liver oil! – the father attached absolute priority to the health and physical fitness of his sons. With his own hands he therefore fabricated a rope ladder and suspended it between the double doors. In later years, Hugo's five children and grandchildren still made eager use of this magnet of attention.

As the eldest child, Hugo probably experienced his childhood years far more consciously than his younger siblings. From the very outset, it seems clear that he would one day become the successor to his father. On this background, his education and professional training were planned and conducted accordingly. On completing his education at a Realgymnasium, a secondary high school strongly focused on science and mathematics, Hugo began a mechanical apprenticeship with Dennert & Pape, in those days a world renowned mechanical workshop located in Altona in the street Kleine Bäckerstrasse. A tradition that, over the generations, would remain unchanged for the Krüss family: Before university studies in the scientific field were undertaken, a practical apprenticeship had first to be completed.

And for Hugo, this was no bed of roses. Referring to his apprenticeship, he would later state:

"Although working life was initially a hard and arduous road for me to follow, I soon came to grips with the effort required."

To such an extent, in fact, that the early days of his professional training already saw him enthusiastically involved in the construction of a small levelling instrument, a task which he was to complete one year later. Three events of major significance to him are next reported in his diary. Despite the tightly restricted framework in which his words are expressed, they nonetheless provide us with a hint of the tremendous importance attached to these occasions by the public at large. First in line was the International Horticultural Exhibition held in Hamburg from the 2nd until the 14th of September 1869. The greatest of its kind in the opinion of Hugo Krüss, this event attracted crowds of visitors to the city. The exhibition site encompassed the Stintfang, a small hill on the right bank of the River Elbe, the Alte Elbpark with its refreshment pavilion and the surrounding Wallanlagen embankments, and, on the other side of the Stadtgraben, the former city moat, the area stretching across to the Seemannshaus, the stately seamen's mission, and the premises of Circus Renz. The magnificent view of the port and the hilly ridges of the so-called Hamburg Geestrücken made it an ideal location for a horticultural exhibition. As Krüss puts it: *"It is quite tempting to believe that one has arrived in a paradise of sorts!"* Located on the other side of the street Millerntordamm, the "Kleines Heiligengeistfeld, an open area still used for funfairs and other large-scale events, was selected as a site where machines and equipment of use in the field of landscape gardening could be displayed.

The exhibitors of such ancillary equipment included Dennert & Pape, the company at which Hugo was serving his apprenticeship, represented with its levelling instruments, theodolites and other horticulturally related exhibits.

The levelling instruments on display at the exhibition included one manufactured by Hugo Krüss, the apprentice. And this instrument won a first prize!

By way of comparison: If a current exhibition in Hamburg attracts 50,000 visitors on one day, this is already considered ample proof of its success. Back then, when Hamburg was not yet home to over a million inhabitants, transport links could only be provided by rail, or along routes still served exclusively by horses and carts. At the exhibition of 1868, however, over 70,000 visitors were registered on one single day.

In those times Hamburg and Altona were both still separate towns, the former Hanseatic, the latter Prussian! Almost concurrently, an industrial exhibition was staged in Altona. Initially conceived on a national level, it was subsequently transformed into an international event, with the disenchanting result that neither option achieved full success. The venue chosen for the exhibition was the concourse of the local railway station – Altona’s town hall nowadays – located on the line from Altona to Hamburg. And yet, here too, Dennert & Pape were awarded a gold medal. As regards the third exhibition, at which commercial products from Hamburg were presented, no further details are provided by the young apprentice. Was no success enjoyed by his company there, or did Hugo not rate the products exhibited all too highly? Be that as it may: The tight scheduling of these three exhibitions within a period of only two months clearly reveals the importance attached to industrial products that were being manufactured by companies based in Hamburg and Altona.

At the beginning of his professional training, the 15-year-old youth wrote the following entry in his diary:

“The apprenticeship is to last for two years, unless this period is shortened due to exceptional circumstances. Each half year Papa will be obliged to pay a fee of 100 marks for my training.”

And such exceptional circumstances did indeed arise: Hugo gave notice to Dennert & Pape and left the company on the 2nd of October 1869 after a 1½-year period of training. Not because anything controversial had occurred; instead, the extraordinarily talented young man was now to widen his practical knowledge and reinforce this by acquiring a university education.

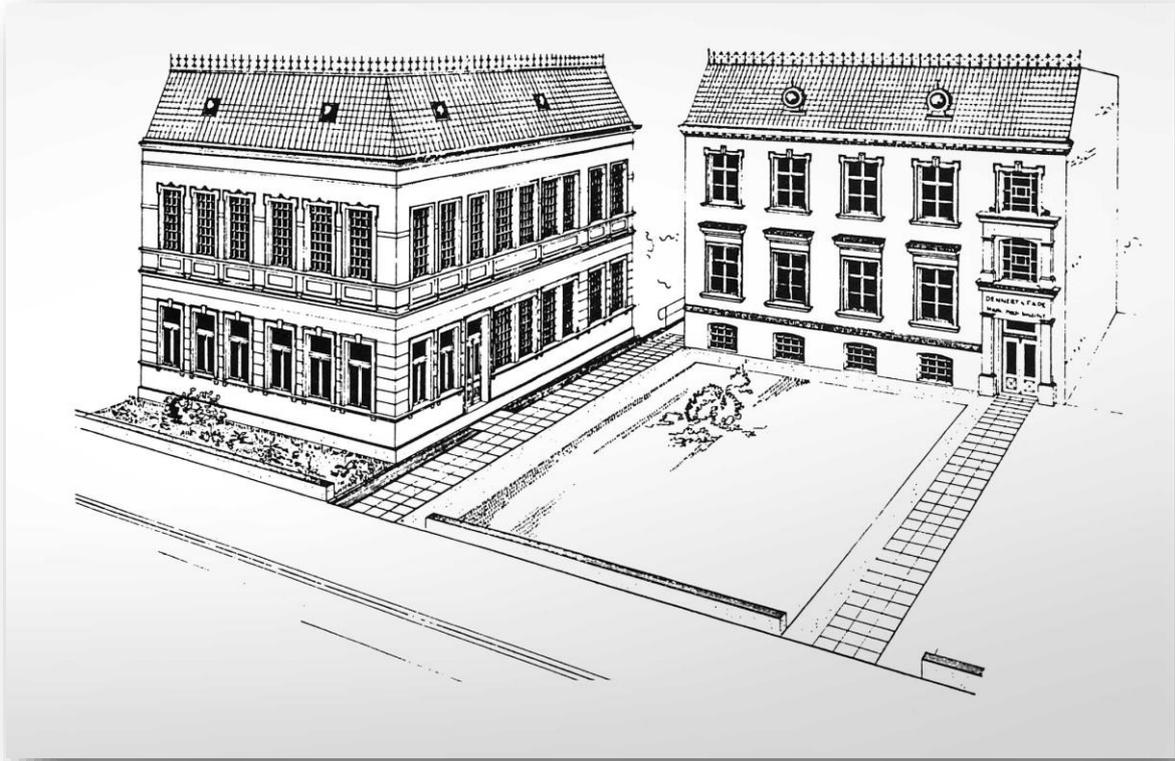
Taking leave proved to be far from easy:

“During the final weeks, I actually felt quite saddened by the realisation that I would soon have to leave the business. The company principal also expressed his regret at my imminent departure. Today he released me from my obligation in the hope that the harmonious spirit of understanding that existed between us throughout my apprenticeship ~~us~~ would also endure in the years to come.”

Hugo Krüss upheld this vow unfailingly, even when he had attained the highest level of honour and dignity.



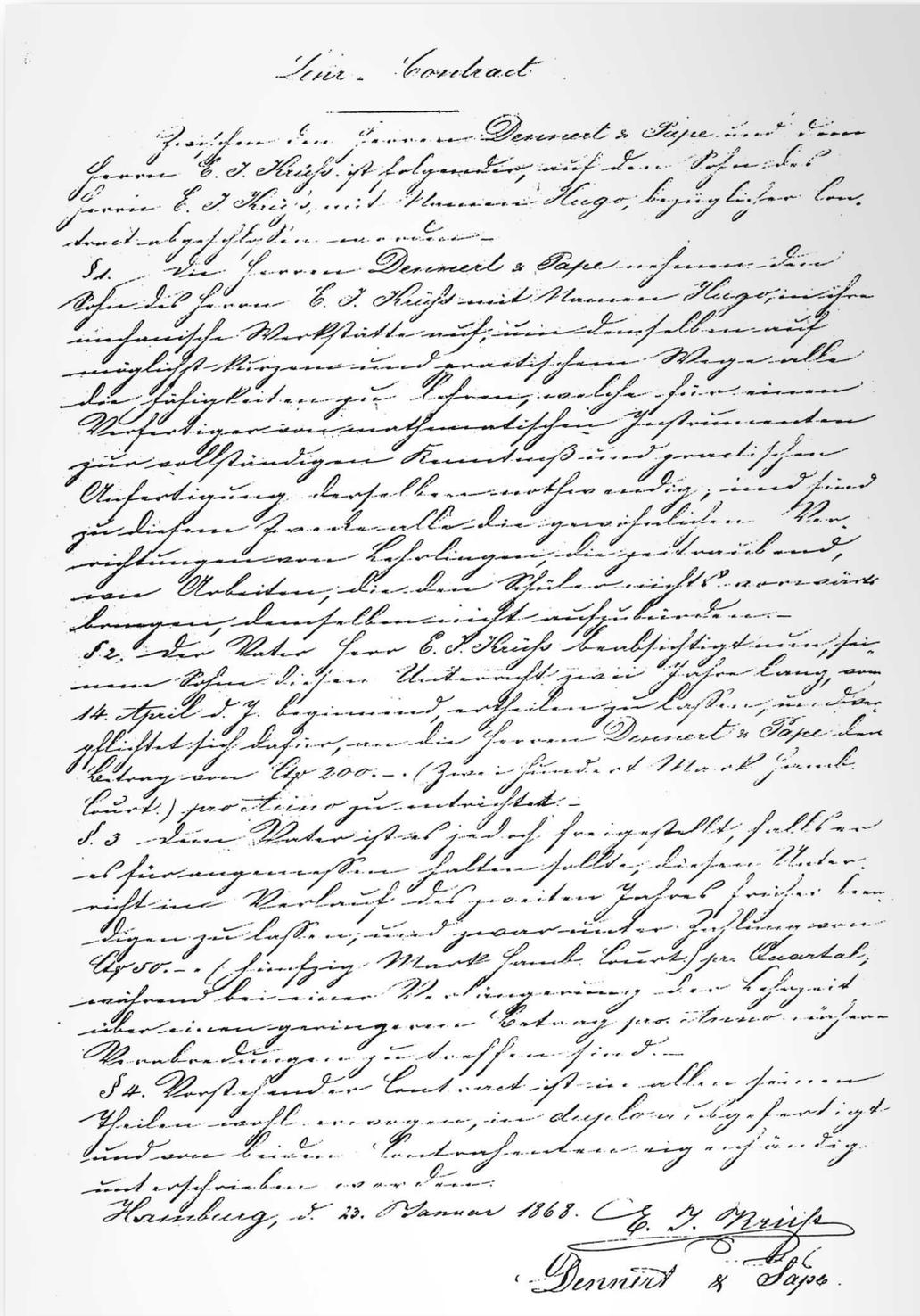
48: Award granted in 1897 on the occasion of the Horticultural Exhibition in Hamburg



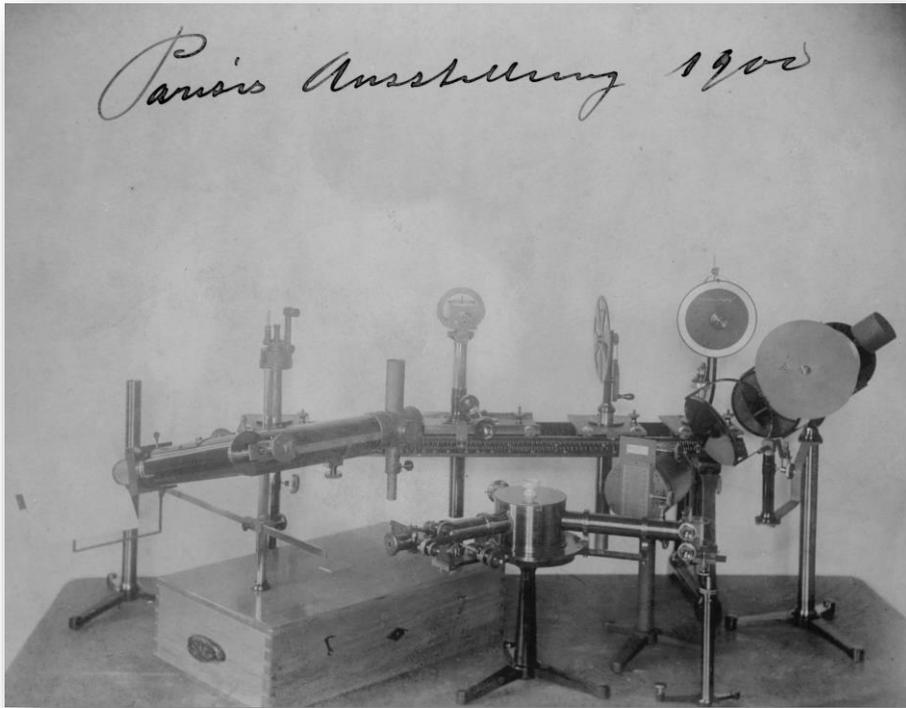
49: DENNERT & PAPE, a company with factory premises at Friedenstraße 53.
As apprentices here, both Professor Hugo Krüss and his son Dr Paul Krüss acquired their skills in craftsmanship

In line with the common custom, the conclusion of his professional training was celebrated in a fitting manner: At breakfast time, each of the journeymen and assistant mechanics received two bottles of beer, whilst the apprentices spent an evening of merriment at Kihn's beer hall. And that really meant something! Then followed the departure from his home city: Hugo moved to Munich for the purpose of receiving further professional training at the workshop for optics and astronomy founded by the renowned physicist Carl August von Steinheil. He then went on to study at the University of Munich. As he knew full well that his destiny lay in the continuation and eventual takeover of the family business, it is hardly surprising that his studies were primarily focused on the field of optics. At the tender age of twenty, he already obtained his doctoral degree with a thesis on the design and construction of a lens. Despite eventually turning his main attention to the photometric sector, he nonetheless also continued his involvement in purely optical research work.

When Edmund Krüss appointed his eldest son as a company partner, Hugo had only just turned 23 years of age. But what practical expertise he brought with him, what scientific knowledge, what ethical maturity!



50: Apprenticeship contract for Hugo Krüss – When commencing his period of training, the 15-year-old noted in his diary: "The apprenticeship will last for two years. Each half year, Papa will be obliged to pay 100 Marks"



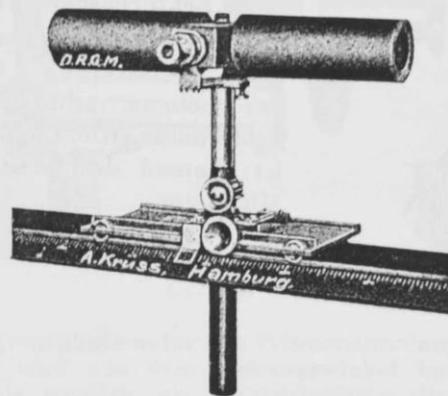
51: Krüss equipment displayed at the Paris Exhibition in 1900.



52: Photometer bench (approx. 1889) as designed by Otto Lummer for the measurement of photometric values

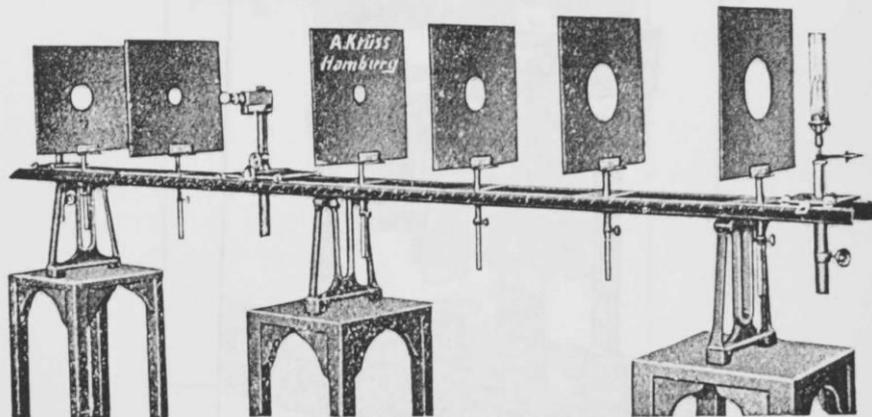
A. KRÜSS, HAMBURG.

Vorrichtungen zur Ablendung falschen Lichtes.



Nr. 202

202. Ablendungsvorrichtung zur Anbringung an den Photometerkopf. In einem Rohr sind eine Anzahl Blenden angebracht zwecks Ablendung des beim Photometrieren schädlichen falschen Lichtes. M 50. —



Nr. 203

203. Blendenscheiben zur Ablendung des falschen Lichtes. Die Scheiben sind mit schwarzem Samtpapier überzogen, sie sind auf einem in der Höhe verstellbaren Tragrohre befestigt, welches mit einem einfachen Reiter auf die Photometerbank gestellt wird; bei Bestellung ist das Profil der Photometerbank und die Höhe der optischen Achse über der Bank anzugeben.

53: Anti-glare panels as accessories for the photometer bench. They were affixed to the 3m-long bench and had various aperture sizes (100/ 70/40 mm)

The links between the Krüss and Vett families

One year later, he married Marie Lisette Vett, of the same age as himself – and, as had previously been the case in the family’s history, this marriage was also blessed with happiness. For Hugo Krüss, too, the family formed the bountiful source from which flowed the strength which he needed to master the many tasks that life set before him. And these would increase with the passing of the years.

Marie Lisette came from a wealthy merchant family. Her grandfather had already adopted a cosmopolitan lifestyle: he was a teacher and ran a private boarding school in the then Prussian village of Bahrenfeld. The prospectus in which this establishment was described as “Mr. C. Vett’s Academy for Young Gentlemen” also refers to the fact that “each pupil has a separate bed.” As his wife had most probably brought a considerable fortune with her into the marriage, Marie Lisette’s father bought the Waldenau manor house and estate located between the towns of Blankenese and Pinneberg. If Marie’s descriptions are to be believed, this must have been a veritable Eden. And authentic they are. This was a charmingly respectable Biedermeier idyll with its own garden, traversed by a “Path of Sighs”, with nooks named “Innocence” and “Paradise”. These descriptions in themselves, captured for her descendants by Marie Krüss, still vividly alert in the ninetieth year of her life, are worthy of publication; not only do they unveil fond, lovingly evoked memories, they also illuminate the world and environment in which she lived. Although her mother, afflicted by tuberculosis, was to pass away shortly after giving birth to twins, the years spent at Waldenau were, as she recalls, a dream come true for little Marie Lisette.

“Most surely, these childhood years also witnessed times of adversity, and yet an enormous gift of God has accompanied me throughout my life, namely a constantly cheerful and love-filled heart that has discovered so many paths to reach out to other hearts.”

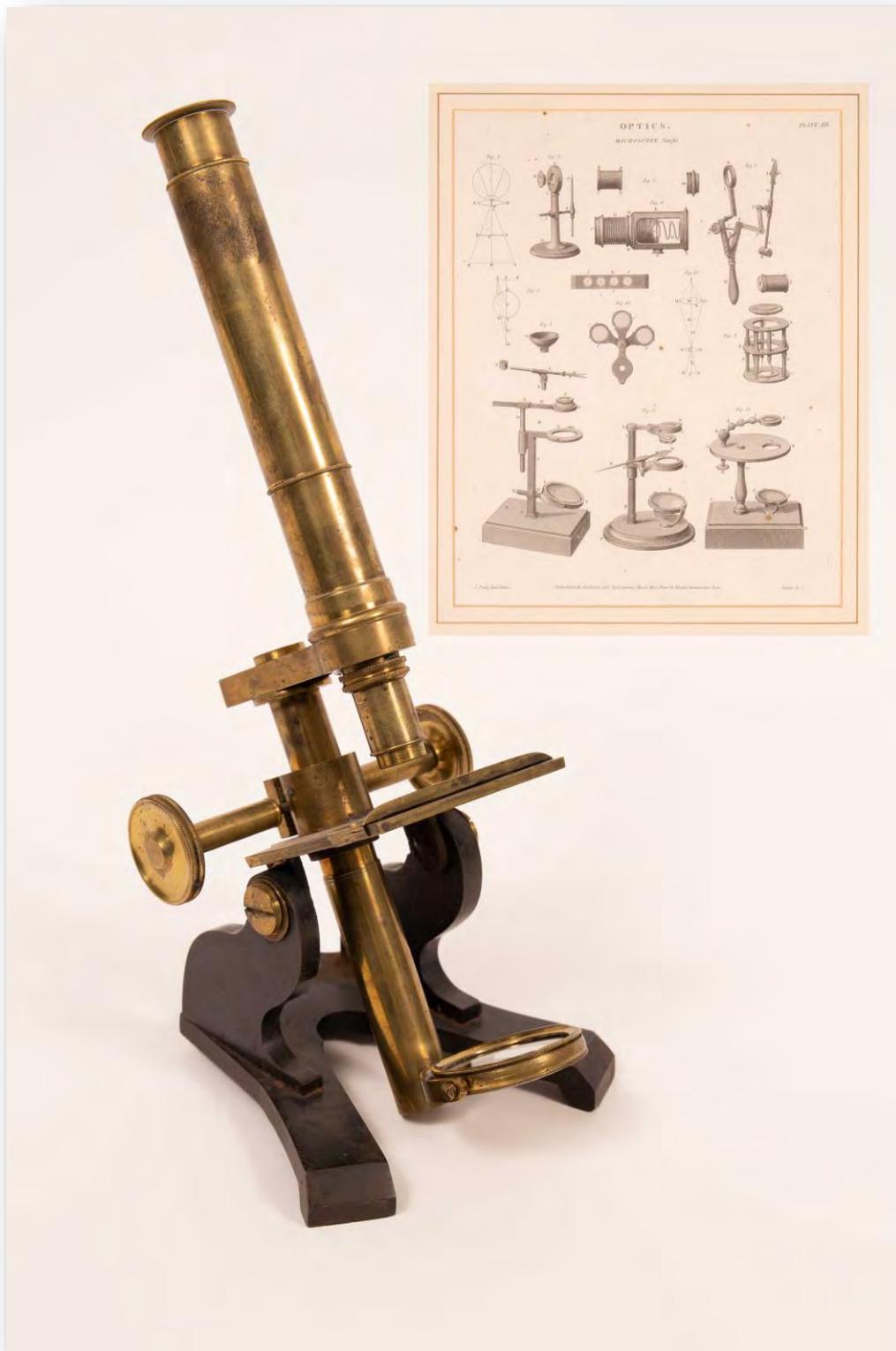
A child of charm and grace, Marie Lisette must have melted the hearts of all who met her. Her first love, childishly innocent in nature, was reserved for a young lieutenant quartered at Waldenau during the German-Danish war, who was to lose his life in the later war with France at the Battle of Gravelotte. He composed a waltz for her, dedicating it to “*ma petite amie Marie Vett*”. Self-composed verses of poetry set down in family chronicles give testimony to affection and admiration. And, during a hike undertaken by Altona pupils in their final school year, the whole class thronged into the Waldenau home, where they were shown warm hospitality.

Together with their cousin Edmund Gabory, the brothers Hugo, Edmund and Gerhard Krüss often travelled out to Waldenau, for numerous connections bound the Krüss and Vett families in a spirit of friendship. As Marie Lisette admits: *“Whenever Hugo arrived, the day took on a different dimension. Even then, the first threads of the happiness that was to fill my life were being woven. I must confess that we were both still babies on the occasion of our very first encounter, and yet the strictly confidential desire then expressed by our mothers was to reach eventual fulfilment”*.

This took its course when Hugo graduated from the University of Munich and returned home with a doctoral degree. *“I then became his happy bride”*. The transition from one Krüss generation to the next, the one now expected to take over at the company helm, proceeded seamlessly. Assured of his father’s unbending support during the transition phase, the junior worked side by side with him until, eventually, the senior was able to hand over the reins of responsibility to his successor. Having taken this step, however, Edmund Krüss was to remain an unfailingly dependable advisor to his son. Long after he had handed over full authority to Hugo, the large desk at which the elder Krüss still sat retained its pride of place in the private office at Adolfsbrücke 7, the company headquarters.



54: *Edmund Krüss, born 1824, died 1906*



55: Microscopes have been manufactured by Krüss since 1862

Anleitung

zur
mikroskopischen Untersuchung des Fleisches auf Trichinen.

Bei gelbem Fleischverfärbung, gelbem Augen, und ein bösen Geruchhaftigkeit begrifft sich der künftliche Mann binnen wenigen Stunden seinen Nippen und die Methode der Fleischuntersuchung, es sollten demnach alle Derselben, welchen ihr Wohlwollen, wie das der Nippen, am Herzen liegt, vornehmlich über Fleisch, Gussfleisch, Schmalz etc., sich mit der Fleischuntersuchung auf Trichinen angängiglich beschäftigen und sich zu diesem Behufe ein brauchbares Mikroskop anschaffen, dessen Anwendung so außerordentlich einfach ist. Man stellt selbiges nämlich bereit auf das bei Fleischuntersuchung dem Auge zugekehrt ist, und kreuzt ihn, während man in das Mikroskop hineinsieht, so langsam hin und her, bis man den Punkt gefunden, an welchem die Beleuchtung am besten ist, legt allmählich das zwischen zwei Glasplatten befindliche Präparat auf den Objektive und bewegt den oberen Körper des Mikroskops in einer mehr oder weniger Neigung langsam hinunter und hinauf, bis man die Stellung gefunden, in der das vergrößerte Objekt am deutlichsten erscheint; bei dieser Stellung wird die genaue Einstellung durch Zahn und Trieb, oder vermittelst einer feinen Schraube bewerkstelligt. — Ist sich der Untersuchende mit dem Gebrauch des Mikroskops vertraut gemacht, so schneidet er mit einer feinen scharfen Schere oder einem scharfen Messer ein äußerst dünnes Zwick Fleisch in der Richtung der Fasern aus irgend einem Theile des Schweines heraus, legt es zwischen zwei Glasplättchen, nachdem er es mit Wasser

oder Ethern befeuchtet hatte und bringt es nun unter das Mikroskop. In diesem Falle wird er nun entweder Muskelfasern oder Fettzellen sehen. Die ersten sind lausförmige Fleischfäden, welche mehr oder minder dicht an einander liegen und vereinigt den Muskel oder das Fleisch bilden. Die Fettzellen erscheinen als blasenförmig erweiterte Ovale, welche vereinigt eine Art Muschelschale zusammensetzen; dies ist aber auch Alles, was ihm unter die Augen kommen wird, sofern er es mit gelbem Schweinefleisch zu thun hat. Nur in Ausnahmefällen wird er die sogenannten „Rautenförmigen Körperchen“ finden. Derselben stellen wurmartige Gebilde vor, welche in einer Muskelzelle sitzen und dadurch kenntlich sind, daß sie einen fönigen Inhalt besitzen, wodurch sie sich von den Muskelzellen selbst auffallend unterscheiden. In der Regel lassen sie sich durch Harten Etnak der Glasplatten aus dem Fleis herauspräpariren und erscheinen allmählich oberhalb in wurmförmig-schraublicher Gestalt. Manort kömmt es.

Soll man nun sicher in der Untersuchung gehen, so muß man von jedem Schweine 6 Zwickchen Fleisch analysiren: 1) vom Schmalz, 2) aus dem Fleische zwischen den Rippen, 3) vom Hals, 4) vom Kopfe, besonders von den Rautenförmigen und der Länge, 5) vom Zwerge, dabei ist das Fleisch der Stellen besonders zu wählen, wo daselbst an die Zeichen sich anzeigt, 6) beide Augen. —



dem Untersucher bei einiger Aufmerksamkeit nicht entgehen, wenn sie wirklich vorhanden sind. Er wird sich im Gegenfalle bald davon überzeugen, daß die größte Schwierigkeit nur in der Geschicklichkeit der Arbeit besteht, die oft erlöblich müht und leicht eine lebensliche Leidenschaft nach sich zieht, mer demnach oft zu unterlassen, muß es sich zum strengsten Geleg machen, nicht ohne feine Untersuchung zu handeln, als bis er seine 12 Präparate hinter sich hat.

Als für diese Untersuchungen sich besonders eignende Mikroskope dürfen die im unterstehenden Kataloge aus meinem Preis-Courante beschriebenen Instrumente zu empfehlen sein.

A. Krüss.

Auszug aus dem Preis-Courante über Mikroskope

von



A. Krüss in Hamburg,

Herstellere von Instrumenten für die physikalischen, mathematischen, physikalischen und technischen Wissenschaften.

Nr. 1. Mikroskop Stedel mit halbfester Vergrößerung, Vergrößerungsfähigkeit und einem veränderlichen Zaustragm. 7 Zoll, Preis, Courant.

Nr. 2. Mikroskop mit Zahn und Trieb zum Einstellen u. 11 Zoll, Preis, Courant.

Nr. 3. Inkomplexes achromatisches Mikroskop mit Einrichtung zur feineren Fokussierung der Objekte, einem Cylindrischen Objektiv von 10 bis 300, oder nach der köstlichen Zwickelform, Entfernung von 40 bis 100 Zoll, Vergrößerung, 100 bis 1000, oder nach der köstlichen Zwickelform, Entfernung von 40 bis 100 Zoll, Vergrößerung, 100 bis 1000, oder nach der köstlichen Zwickelform, Entfernung von 40 bis 100 Zoll, Vergrößerung, 100 bis 1000.

Trichinen-Objektive von 12 @gr. bis 24 @gr. von Zeiss.

Vollständige Mikroskop-Preis-Courante gratis gegen portofreie Anfrage.

Print von S. S. Meyer in Berlin.

57: Instructions from approx. 1870 on how to examine meat for the presence of trichina



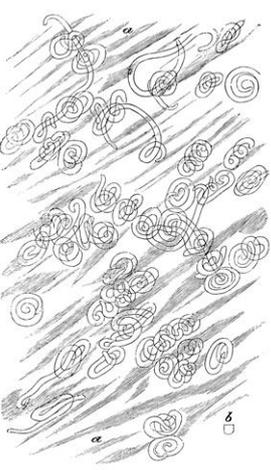
Zu Vergleichung vergrößerte Muskelzellen aus einwärtsgezogenen Trichinen aus demselben nach zwei getrennte Fasern. (Nach Braunert.)



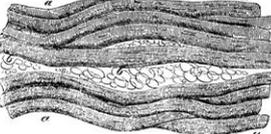
Einwärtsgezogene Trichinen in einem muskulösen Gewebe, als weiße Fäden mit weitem Hohlraum. (Nach Braunert.)



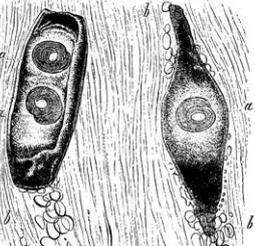
Zwei eines Querschnitts vom Menschen. Die weißen trichinigen Fasern aus demselben die Fasern, die trichinen, bilden gebildet den unvollständigen Muskel. (Nach Braunert.)



Einwärtsgezogene (freie) Trichinen im Menschenfleisch (aus der Hypogastrie von Burg). b) Zwickel Fleisch aus menschlicher Oberke.



Muskelzellen aus einem gelben Schweine mit ihrem Hohlraum und Querfalten. a) Derselben eine Betheiligt und rautenförmige Fasern bilden. In Trichinen Vergrößerung nach der Natur gegeben.



Zwei Fasern aufsteigende Trichinenfasern mit ihren Hohlraum. a) Abgelagerte trichinen. (Nach Braunert.)

Mikroskopische Bilder vom gesunden und kranken Schweinefleisch.

Optisches und physikalisches Institut von A. Krüss in Hamburg.

56: Microscopic images of pork and human muscles

Although now retired from active involvement in the company's business, he still administered the endowment of scholarships and continued to assume authority for the numerous honorary offices to which he had been appointed.

In 1877, when Hugo Krüss and Marie Lisette Vett were joined in marriage, they moved into the very same flat on Hahntrapp in which the eldest Krüss son had first seen the light of day.

Their second-born child, Paul, the son who would one day take over the family business, was born at Rathausstraße No 6. On the 1st of October 1880, that is to say eight years before Dr. Hugo Krüss assumed ownership of the company as sole proprietor, Edmund sold the house, together with the optical workshop and store which it incorporated, to his son who, together with his family, moved into the apartment occupying the third and fourth floors. Edmund and his wife Agathe rented an apartment at Alsterdamm No 35, the street later renamed Ballindamm, a "belle etage" with a view across the Alster lake. In conjunction with the wide foresight of technical innovation that has defined all generations of the Krüss family, the sound professional training Dr Hugo Krüss had obtained at the Steinheil workshop in Munich and the expertise acquired so early in life, all enabled him to resolutely lead his company forward into the new era that, as in all other technical sectors, was also to witness the unstoppable march of progress in the fields of optics and precision mechanics.

Fresh heights were scaled at the Krüss company workshop thanks to the new fields of production that Hugo introduced. Activities were now primarily focused on three key areas: photometry, spectroscopy and the manufacture of various and constantly enhanced types of projection apparatus. The production of large-aperture lenses was discontinued so as to avoid any competition with the Steinheil company. In addition, a photographic laboratory was set up in which diapositives were created that presented a wide variety of images, scientific and technical, for example, geographic and ethnological, or of antique art and other fields of culture. Even in those early days, the young Dr Krüss enjoyed a superb reputation, not only with his peers, but also with the public authorities. Back in 1876, for example, the German Maritime Observatory ("Deutsche Seewarte") already entrusted him with the compilation of an expert report on the visibility of marine navigation lamps.

In the field of photometry, Dr. Hugo Krüss was one of the first to conduct investigative research in all directions, both practical and theoretical. In 1886, in other words before he assumed sole responsibility for the family enterprise, Hugo's manual on electrotechnical photometry was already being printed. Hand in hand with theoretical discourse, the emphasis was on improving conventional instruments and designing new ones.

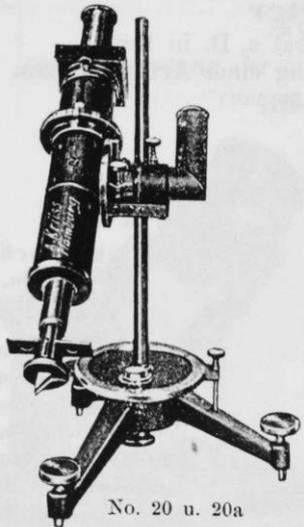
Together with the illustration of a photometer for determination of the brightness of electrical arc lamps and incandescent light bulbs, an advertisement placed in 1890 by the Optical Institute A. Krüss in Hamburg includes the following statement:

"A photometer that I manufactured was selected for application by the reviewing committee at the International Electricity Exhibition held in Munich in 1882. These instruments are also being used by Prof. Kittler in Darmstadt (Electrotechnical Institute of the Grand-Ducal University of Technology), by Messrs Spieker & Cie in Cologne (a limited commercial partnership involved in the field of electrical illumination) and by the Edison enterprise in Berlin". Speaking of Edison: With the inclusion of the very latest improvements, the famous Edison phonograph – better known as the "American speaking machine" – was also manufactured at the Krüss company's Adolphsbrücke workshop. To quote the advertising text: *"It speaks, sings and whistles in a most excellent manner!"* This machine cost 140 Marks, however, a far from inexpensive price back in 1890. Metal plates for use on the phonographs were sold for 10 Marks per hundred pieces.



57: Photometer in approx. 1886

II
A. KRÜSS, Optisches Institut, HAMBURG.

No.		M
20		
20a		
	Photometer nach L. Weber mit Polarisations-einrichtung (Ztschrft. f. Instrk. 11, 6. 1891) zur Messung des Himmelslichtes, auf Stativ mit Teilkreis. Gegen das horizontale Rohr ist ein beigegebenes Knierohr mit Rauchglas auswechselbar; im übrigen wie No. 19	700.—
	Photometer nach L. Weber mit Polarisations-einrichtung wie No. 20, aber für Gleichheit und Kontrast	725.—
	Krüß	

58: Photometers made by Krüss were used by the reviewing committee at the International Electricity Exhibition held in Munich in 1882

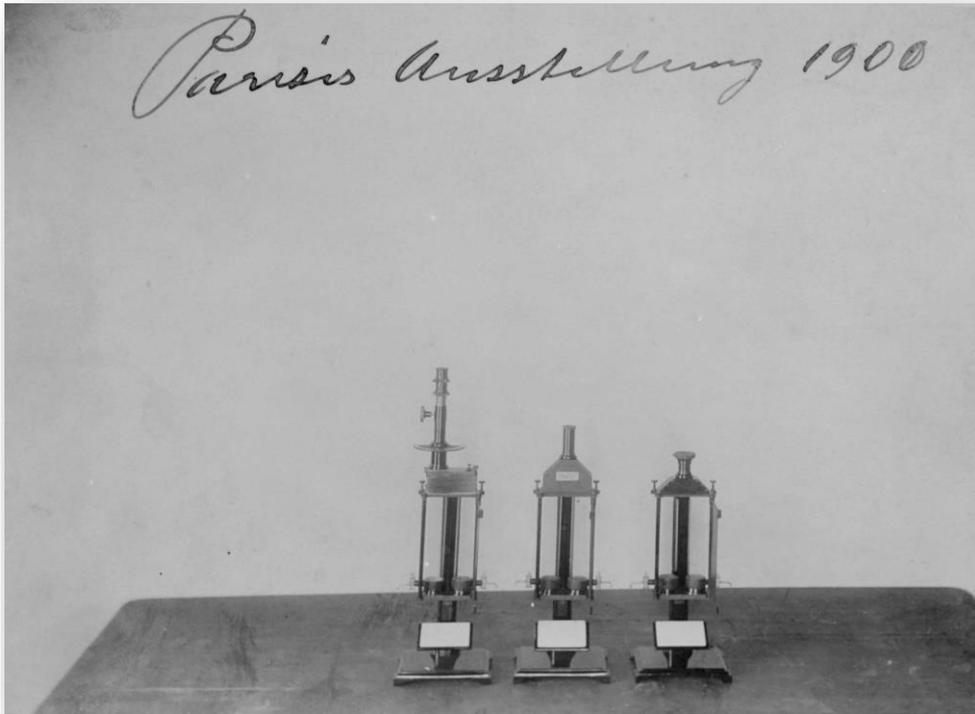


Hamburg, den 1. Januar 1862
 (Adolphsbrücke, 7.)
 J. T.
 Herr J. W. Müller
 Del.!

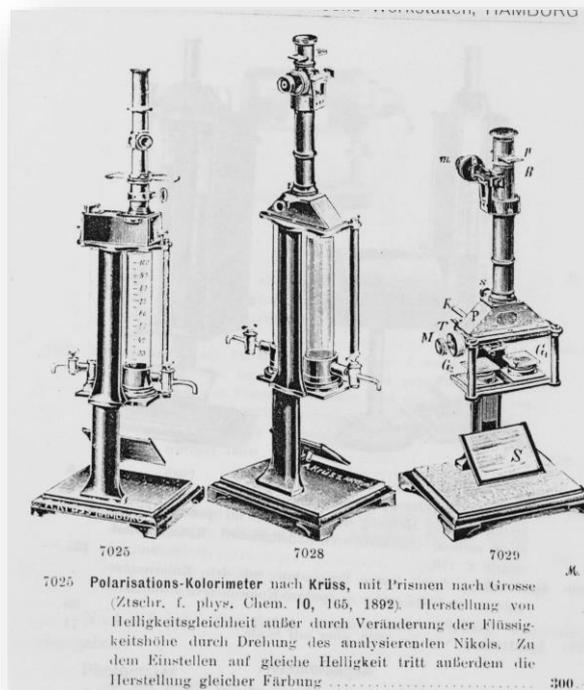
1881. März	1	1 Nachtglas I & II	M	50.-
		1 Seifenwaage	.	75.-
		1 Compass	"	8.-
			M	133.-

Herr J. W. Müller.
 - ist nach Sydney Australien gerufen
 und wird wohl nur erst nicht wieder hier
 fallen wir bitten für Adresse wissen
 werden wir Sie dafür wissen lassen
 D. Müller

59: The A. Krüss enterprise had already been active for 90 years when this invoice with its lavish letterhead was sent



60: Colorimeters at the Paris Exhibition in 1900



61: Krüss colorimeters were used, for example, to conduct the quantitative assessment of minimal quantities of copper, tin, lead, manganese, titanium, cobalt and uranium

In the meantime, Hugo's two brothers had also concluded successful apprenticeships. For a number of years, Edmund Krüss jr, the second of the Krüss brothers, was also active at the company in a commercial capacity. In his early years, the youngest son Gerhard, a highly talented chemist, became a professor at the University of Munich. Fate unfortunately decreed that the life and creativity of this brilliant man would be cut short all too soon. In 1883, he acquired his degree as a Doctor of Philosophy from the Ludwig Maximilian University in Munich.

In 1886, having submitted his postdoctoral thesis titled "Investigations on the atomic weight of gold", for which the university awarded him the so-called "venia legendi", the authorisation to teach at the highest level, Gerhard moved to Stockholm, where he acquired extensive knowledge in the field of rare earths. On returning to Munich, now married to the daughter of Privy Councillor Carl von Voit, a renowned Munich physiologist, the freelance lecturer turned down a position offered to him in Baltimore. And a short time later, having meanwhile acquired the title of associate professor, the youngest of the three brothers also declined the opportunity of becoming Director of the State Laboratory in his home city Hamburg. He instead founded a scientific journal devoted to the field of inorganic chemistry and published numerous specialised papers and textbooks. Published by Leopold Voss in Hamburg, one of the most important works by this scientist, who died at the age of only 35 years, was written in collaboration with his brother Hugo and titled "Colometry and Quantitative Spectral Analysis", a book highly regarded in specialist circles. This publication was based on the joint work of the brothers in promoting the creation of instruments for use in the fields of colometry and spectral analysis. The findings of their research were recorded in the manual. Thanks particularly to his photometric skills, Dr Hugo Krüss rapidly gained widespread renown as an authority in this field. Both the German Association of Gas and and Water Specialists, today's DVGW, and the German Society of Lighting Technology, now known as LiTG, appointed him to their light measurement commissions, whereupon he was sent to Zurich in 1903 to take his seat on the International Commission on Light Measurement. In this capacity, Dr Hugo Krüss contributed greatly to the introduction of the Hefner lamp, used to measure light luminosity and created by the Physical-Technical Institute of the German Reich, the predecessor of modern Germany's metrology institute PTB. Throughout his career, the knowledge and skills acquired by Hugo, a basis on which his worldwide reputation continued to flourish, were not restricted to his own company business. As a dedicated, conscientious citizen, he ceaselessly ensured that his activities, both at home and abroad, would also benefit the welfare of the general public. This became particularly apparent on the death, in 1892, of the chairman of the German Association for Precision Mechanics and Optics, co-founded by the eldest Krüss brother and a forerunner of today's SPECTARIS. It was far from easy to find a successor for a man as influential as Leopold Löwenherz. A unanimous decision was taken to offer Dr Hugo Krüss the chairmanship of this association. After a short period of reflection, he expressed his willingness to assume this responsibility. An article in the specialist journal "Zeitschrift für Feinmechanik und Präzision" stated as follows:

"Following the death of their founder and head, torn from their midst so unexpectedly, what good fortune for the German Association to discover that a perfect successor was not only available, but willing to assume the reins of responsibility, a man blessed with all the essential characteristics needed when leading such an eminently important association: Understanding of the scientific, technical, social and commercial issues of the age, mastery of his art, wisdom in selecting the means required and vigour in their implementation, all crowned with an amiable and refined demeanour."

At that time Dr Hugo Krüss still stood in the prime and vitality of life. The wise advice he dispensed within the executive board and the self-assured, diplomatic manner he maintained at mechanics conferences won him an outstanding reputation with his fellow specialists and peers. In insider circles, it was common knowledge that he had largely inspired the organisation of those ground-breaking annual assemblies that proved so invaluable in promoting the association and its work. And, highly adept as he was in commercial matters, it was hoped that he would lead with the same steady, unflinching hand as head of the association. And these hopes were fulfilled completely. When Hugo Krüss assumed chairmanship of the German Association, it was still in the midst of tackling the most crucial technical and social questions of the day – issues which would gain in ever-increasing importance.

One problem that needed to be solved was the creation of uniform fixing threads. Although the greater part of this task had already been accomplished by the Physical-Technical Institute of the German Reich under his predecessor Löwenherz, Hugo Krüss assumed his new responsibilities just as an international convention was due to take place during which interest in this thread was also to be aroused outside of Germany. At the following fine mechanics congress in Munich, chaired by Dr Krüss, the new thread was selected as the official standard and named Löwenherz thread.

In conjunction with this undertaking, ensuing work was focused on the standardisation of pipes with regard to their dimensions and threads. Responsibility for these activities was also assumed by Dr Hugo Krüss. This issue was successfully concluded in 1905 on adoption of a formula proposed by Krüss himself.

Not only technical difficulties needed to be resolved, however: The second task, far more extensive and possibly even more important, was of a techno-social nature. At the beginning of the 1890s, loud demands were being made in German domestic politics for more rigorous organisation, under state supervision, of the crafts and trades, which were supposedly steering towards their downfall. Back in those far off days, too, such concerns were already being voiced!

Admittedly, even the German Association for Precision Mechanics and Optics was obliged to acknowledge the evils that had also befallen their field. Unanimous agreement was nonetheless reached that this branch of German mechanics, which had always enjoyed an excellent reputation for its faultless precision, would be disastrously impacted if people without the faintest idea were also allowed to have their say.

And yet the attempt to obtain an exceptional status for the field of precision mechanics within the new regulations for trade, industry and commerce was doomed to failure. In 1897, however, when the Act took effect, Dr Hugo Krüss, experienced and adept as he was, managed to engineer the best solution: all demands that it had been impossible to assert against or without the newly established Chamber of Crafts, were therefore to be settled in collaboration with this institution. In such manner, for example, the wording of the contract of apprenticeship and training was formulated, the terms and conditions for the apprenticeship period established, these including the creation of a control commission based on equal representation of all concerned and preparation of the examinations to be taken by apprentices or assistant staff. And it indeed proved possible to convince the Chamber of Crafts to accept these provisions. Thanks to the skills of its main representative, the field of precision mechanics was therefore able to reap the benefits afforded by the new Act without having to endure any of the drawbacks.

And, in yet another area of state and public administration, Hugo Krüss was also able to protect the rights of those active in the field of precision mechanics and awaken recognition of its importance: in trade and customs policy.



62: Certificate commemorating the 50th company anniversary in 1894

Dr. Hugo Krüss – The specialist in the field of optics

At the end of the 19th century, the government of the German Reich set about initiating an amended customs tariff in preparation for new trading agreements, this in co-operation with the competent trade and industrial associations. The precision mechanics sector was represented by the German Society for Precision Mechanics and Optics. On behalf of the Society, Dr Hugo Krüss assumed representation of its interests before the Reich authorities.

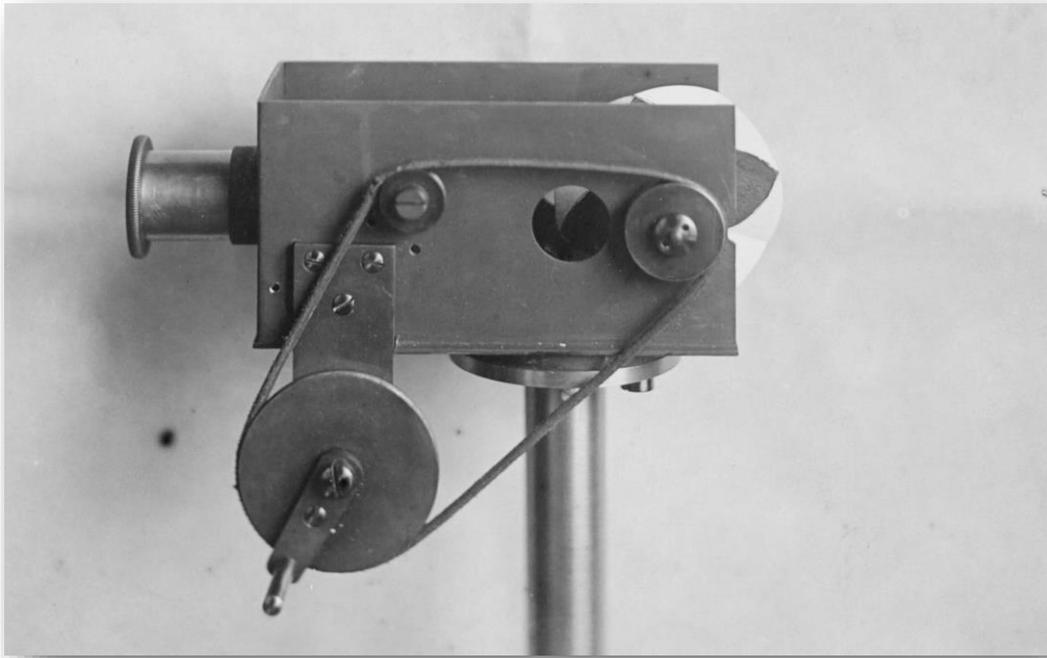
The initial target was to ensure separate categorisation, within the tariff structure, of high-precision mechanical products, then still listed as brassware, steel goods and the like. But these demands were all still too new for the government officials of the time. Although full approval could not be obtained, it was at least possible to list “scientific instruments” as a single item, if not as several, which would have made far more sense. This success was soon repeated when scientific instruments were granted exemption from customs duties.

Of further significance in the development of economic policy, specifically in the field of precision mechanics, was the appointment of Dr Hugo Krüss by the Reich Office of Statistics to its trade statistics committee, which was assigned the task of determining the quantity and value of imported and exported goods. Within the framework of this special task, Krüss finally succeeded in achieving a lasting differentiation between the various scientific instruments, thus ensuring that declarations of value were made in accordance with the price actually charged for each individual article.

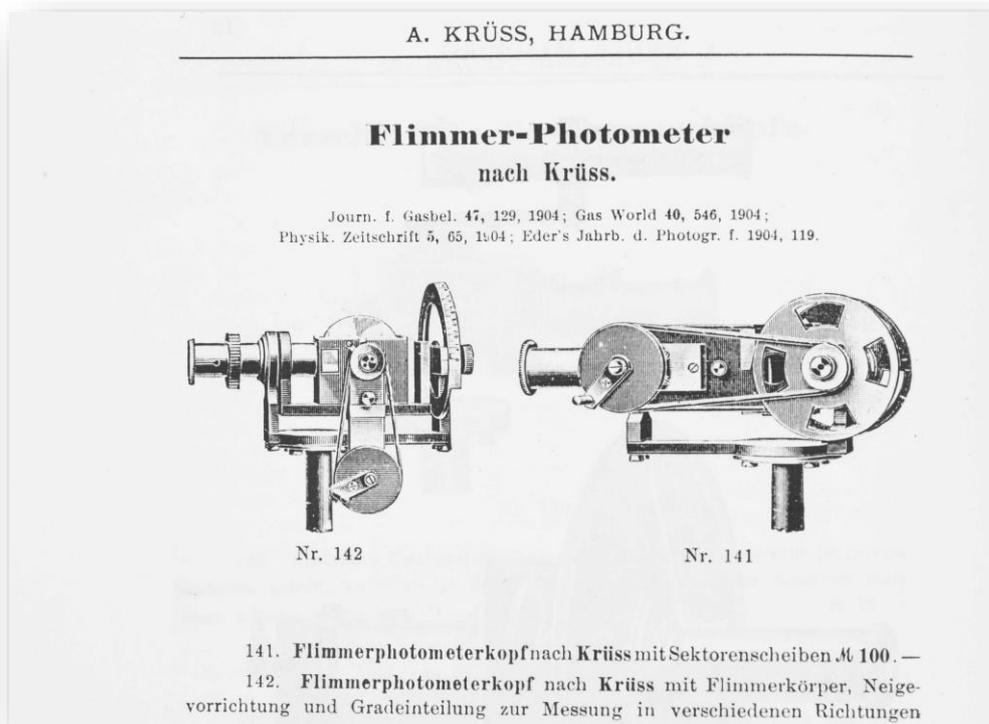
In addition to all these decisions - of crucial importance to such a major branch of German mechanics - other more modest tasks had to be performed, one of which was the organisation and management of the mechanics conferences. Krüss was blessed with an exceptional mastery of rhetoric. And this came fully to the fore on such occasions. He never lost track of the issue at hand, even in the most heated debates, thought things through and remained cool and detached. Even the most sensitive situations were defused and brought back under control. Either through an earnest admonition, or, alternatively, a brilliantly witty comment, which, as already noted, arose from the spirited disposition which he so naturally displayed.

Not only was Dr Hugo Krüss a powerful orator; above all, he was also a master of the written word. With his brilliant grasp of the material at hand, he was always able to express this in a clear, understandable style. Attention has already been drawn to some of his writings. Over the decades, well over a hundred of these were published! The most important and numerous of his publications deal with scientific topics. His central subject was, and remained, the field of optics. And his final scientific work, published posthumously, was no exception. Many of his writings contain descriptions of newly designed constructions, some of them developed in his own workshop. To name but a few, these newly designed or enhanced instruments and innovations included the Krüss optical flame meter, a flicker photometer and spectral photometer, a light meter and the integration of reflection prisms for easier control of the photometer head. In addition to his scientific publications, Dr Hugo Krüss also penned a range of works relating to economic policy and philosophy.

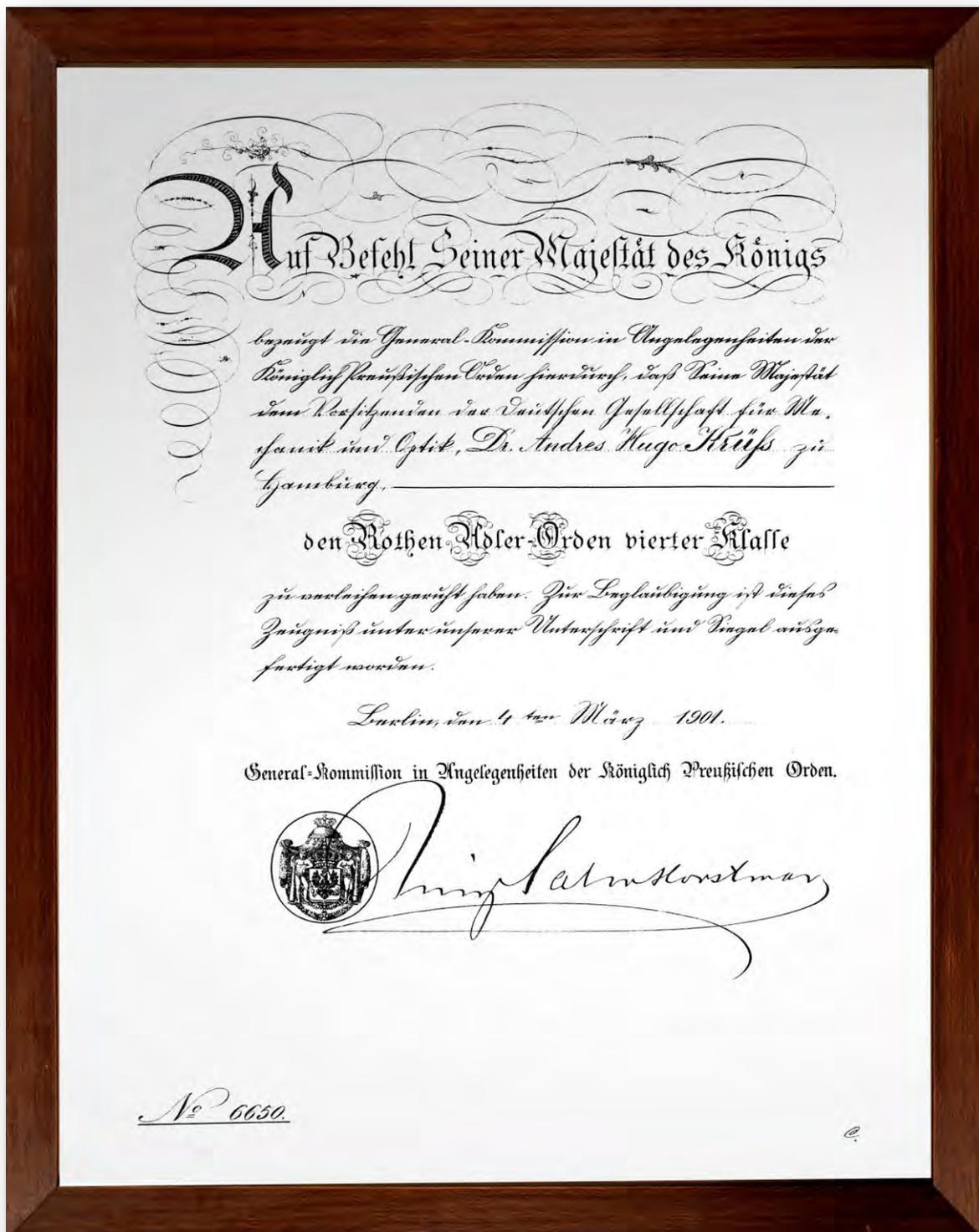
Needless to say, a man engaged in activities of such extensive national and international importance was showered with honours. Having already being decorated with the Order of the Red Eagle in 1901 by Wilhelm II, King of Prussia, he was awarded the Royal Order of the Prussian Crown, 3rd Class, three years later. On the death of Ernst Abbe in 1905, the Reich government appointed Krüss to the Board of Trustees of the Physical-Technical Institute of the German Reich. And ever since the foundation of the Deutsches Museum in Munich, he had served as a member of its supervisory council.



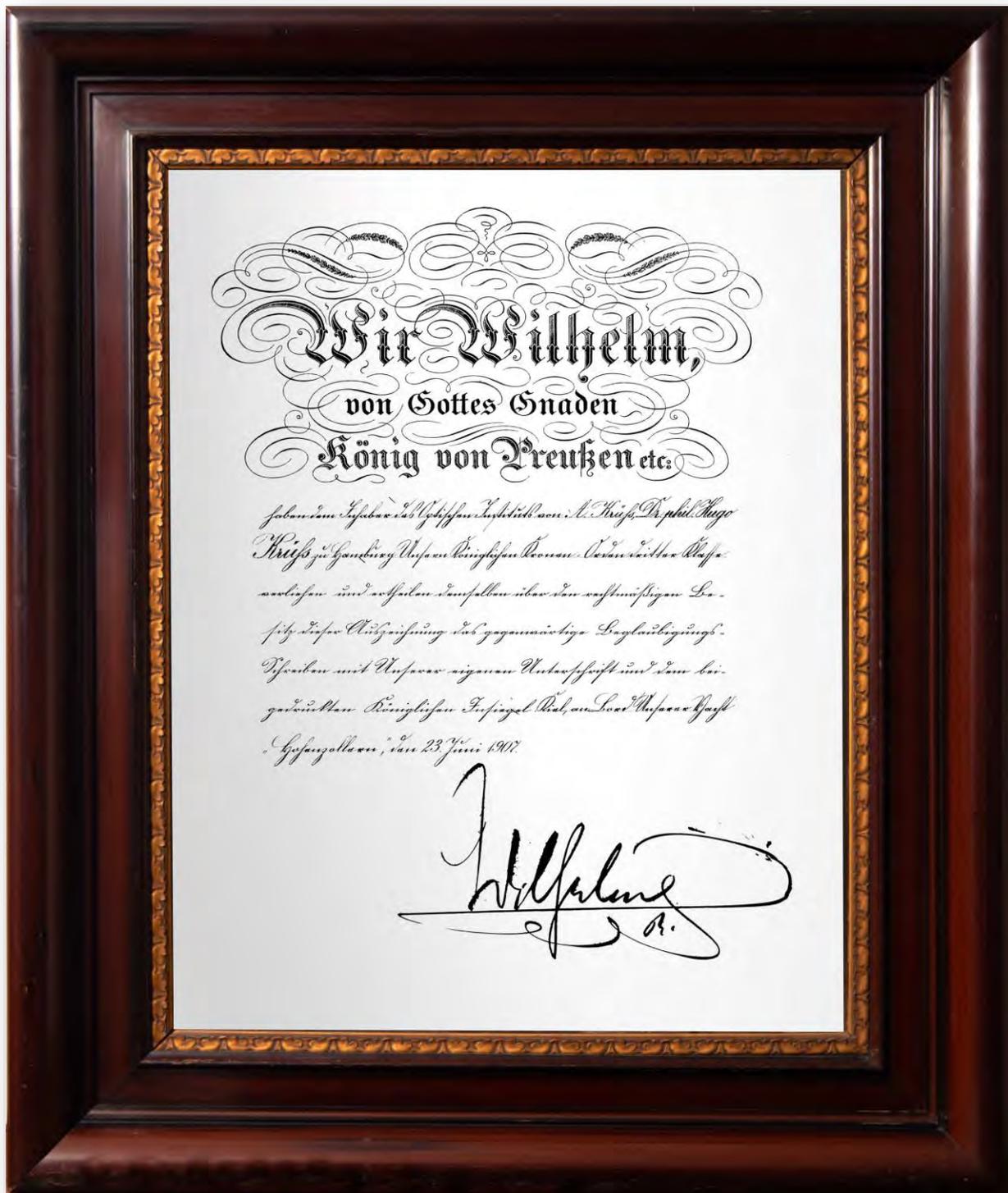
63: A flicker photometer, with which the photometric values of various colours could be measured visually (heterogeneous comparison)



64: Photometers were produced and sold by Krüss from 1876 onwards



65: The Order of the Red Eagle was conferred on Hugo Krüss in 1901



66: Hugo Krüss was awarded the Royal Order of the Prussian Crown aboard the royal yacht Hohenzollern



*67: Professor Dr Dr Hugo Krüss, born 1853, died 1925.
Company Owner from 1888 until 1920,
President of the Hamburg Council of Churches between 1920 and 1925*

In 1917, at the age of 64, on the recommendation of Albert Einstein, he was appointed as a professor by the Hamburg Senate, on the very day, in fact, that he celebrated his 25th anniversary as Chairman of the German Society. He became an honorary professor of the University of Hamburg, the creation of which he had promoted so intensively. Only to name the most important other offices he held, Professor Dr. Hugo Krüss was a member of the industrial commission created by the Chamber of Commerce, and also of Hamburg's higher education authority, the Oberschulbehörde. In this capacity, he played a key role in promoting the establishment of the astronomical observatory in Bergedorf – not far from the spot where, as a child, he had gazed in awe at the starlit sky through the telescope of his father.

He was a devout man. A natural scientist, true, but not one who took scientific knowledge as the exclusive root of wisdom. In his final years, Professor Dr Hugo Krüss was the President of the Hamburg Council of Churches. On account of his accomplishments in the service of the Church, the title "Doctor honoris causa" was bestowed on him by the Theological Faculty of the University of Göttingen. A street was named after him in the Hamburg district of Barmbe(c)k. Distinctions - successes - nominations! How could one mere mortal cope with such a wealth of activity, all essentially focused on hard work and responsibility? Where did he find the energy and time to continue his leadership of the Krüss enterprise, to strengthen and expand its business, which, after all, formed the core of all his other commitments?

For Dr Hugo Krüss, the primary source of strength was the family. His parents had already set the stage in this respect, and, together with wife and children, he unswervingly continued along this same path. The sons born to him would eventually become the assistants and successors to whom he could directly pass on his knowledge and expertise.

The marriage was blessed with the birth of several children, a source of enormous joy to Hugo and his wife Marie. At the beginning of their marriage, having moved into the ancestral family home at the Adolphsbrücke, Marie Krüss, a lively, vivacious lady, initially assisted the company photographer. But then she gave birth to five boys, two of whom, sadly, were soon to pass away. Two girls were born next, the first for generations! Like his father, the eldest boy was named Hugo, followed by Paul, who would one day take over the family business, and Edmund, the youngest. The elder daughter Marie, later to become the wife of Dr Ludwig Dörmer, set down a series of delightfully unforgettable recollections. Not only do they evoke the twilight years of the grandparents, whom the children loved to visit, they also portray the parents from a child's perspective. The warm hearted mother, whose love and affection the elder girl was obliged to share with her younger sister Hedda. The father, for whom the children, while strolling around Hamburg's great Christmas Market, the Dom, would sacrifice some of the few pfennig coins in their pockets to bring home a bag of Dutch Kientjes for him to enjoy, those pieces of candy that could be stretched into long shimmering golden strands.



68: Prof. Heinrich Kohlschutter, born 1881,
died 1969



69: Marie Dörmer, née Krüss, born 1887,
died 1959



70: Prof Dr Ludwig Dörmer, School Administrator in Hamburg until 1933, born 1877, died 1952
Marie Dörmer, née Krüss, born 1887, died 1959

In 1897, the family moved into the street Hochallee. House No 77 has survived until the present day. Hugo, often accompanied by Marie, would almost always walk the long way from Hochallee to Adolphsplatz and back. The children were not allowed to take the tram. As Marie recalls:

“In the morning, he mostly set off from home so late that I frequently had to run between Dammtor and our school, where a change of shoes and stockings awaited me. On the way to class, I devised essays with Father’s inspiration. Discussion of the topic at hand aroused many a useful idea in my mind. Between Oberstrasse and Werderstrasse, I was obliged to repeatedly breathe in for six steps of the way, and out for the following six, all as noisily as possible, reputedly conducive to good health, but also extremely embarrassing whenever people passed us on the way.”

This did not bother the famous father in the slightest. Together with his daughter, he sang a self-composed canon whenever the ice cream cart of Lahmann und de Voß was passing by, and many another diversion livened up the long walk. As was customary in the Krüss family, the sons first completed a practical apprenticeship before embarking on their studies at university.

On account of his predisposition and inclination, it was decided that the second son Paul, born on the 5th of September 1880, would one day assume leadership of the family enterprise. This already took place shortly at the turn of the century in the year 1904. Dr Hugo Krüss now had more time for the many tasks he was expected to perform outside of his own company framework.

Initially destined to become a natural scientist, the eldest son Hugo also wrote his doctoral thesis on a topic relating to the field of optical physics. In the year when his younger brother took over at the company helm, Hugo was sent by his father to the world exhibition in St. Louis with supervisory responsibility for the German optical and precision instruments on display. Two years later, the young Reich Commissioner who had been delegated to oversee this exhibition, Dr Lewald, later to become a state secretary, offered the talented Hamburg citizen a position at the Ministry of Culture in Berlin. An illustrious career awaited him there, one which would eventually take him to the highest level when he was appointed as Director General of the Prussian State Library. Privy Councillor Hugo A. Krüss was the last to be entrusted with this high office, however: Having organised the successful wartime evacuation of library resources, he died in Berlin in 1945.

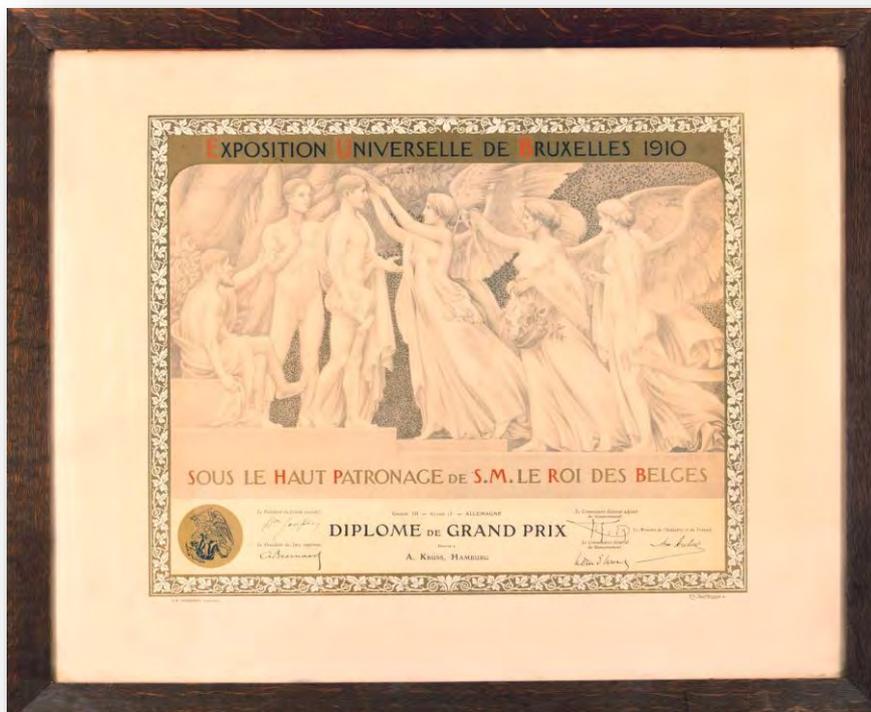


71: Hochallee 77

In 1897, the family left the Adolfsbrücke address and moved into this house



72: Award granted to the Krüss enterprise in St. Louis in 1904



73: Award granted to the Krüss enterprise in Brussels in 1910



74: Overview of the awards granted to the Krüss company between 1855 and 1897



75: Professor Dr Dr Hugo Krüss, born 1853, died 1925



76: Marie Lisette Krüss, née Vett, born 1853, died 1943

Master Craftsman with a Doctoral Cap

Whilst his father and forefathers had ensured continuing expansion of the family business, Paul Krüss, the great grandson of the company founder Andres Krüss, was compelled to endure the consequences of two world wars and ensuing hardship during the interim and following years. In 1904, when Paul Krüss joined the family enterprise, the world was still a relatively peaceful place, business was flourishing, and the meteoric developments affecting all areas of precision mechanics were also being felt by the burgeoning company at the Adolphistraße. Paul, the second son of Prof. Dr Hugo Krüss, spent the first seventeen years of his life in this house. As he recalls in his memoirs:

“The house was located at the canal by the bridge, the narrower house front looking onto the Adolphistraße, the longer of the two onto the Alsterfleet canal, which was still relatively wide at this point. Behind the front door there was a lobby, on the right side of which a door led off to the shop. On proceeding straight ahead, visitors reached the staircase via a hallway. A sign hanging on the door to the hallway announced ‘Comptoir (main and accounting office) and storeroom at the end of the hallway’. Next, one had to walk along a narrow corridor. A door on the right side of this corridor led into the shop, across from which, on the long side, another door opened into the private office of my father.”



77: Adolphistraße 7, shop in 1907



78: Adolfsbrücke 7, main office in 1907.

Dr Hugo Krüss also often stood at the high desk and personally took charge of the general accounts ledger

In the middle of this room there stood a large desk, at which Paul's grandfather also sometimes sat. Having retired from the daily business, he was nevertheless still responsible for administering various scholarship foundations.

On proceeding further along the corridor, the visitor reached a door on the left which opened into a small room occupied by the spectacles-glass grinder. With a foot-operated grindstone he set about the task of grinding spectacle lenses until they fitted into their frames.

The main office was located at the end of the corridor behind a glass partition with two hinged doors. At two high desks set against the walls in this room, the bookkeeper – known back then as as "the young man" – and an apprentice performed their tasks, either standing or seated on high stools. Dr Hugo Krüss, too, often stood at his high desk and personally recorded financial transactions in the general ledger. The safe stood against the back wall. Every Saturday, the staff wages were collected from the Norddeutsche Bank, which was located diagonally opposite to the company premises. The only paper money in circulation at the end of the 19th century consisted of the 100- or 1000 Mark banknotes. Payment was made with 10- and 20 Mark golden coins, silver coins such as the Silbertaler, and others of lesser value made of silver, nickel and copper.

Typewriters were not yet in use, nor were letter files. Letters were accurately written by hand using copier ink and then reproduced with a copy press. This task was assigned to the apprentice.

The letters were bundled and classified, the thin copied letters filed away. As Paul Krüss recalls in his memoirs:

“Behind the main office lay a storeroom and packing room. This was the domain over which Cäsar Kienert held sway, our packer and messenger. Employed by my grandfather in 1875, he faithfully served the company for sixty years”.

It was not until 1935 that he was finally encouraged, almost forcibly, to take his well-deserved retirement, for he saw no meaning in a life without his beloved working routine. When he eventually passed away, he had nonetheless reached the grand old age of 85 years.

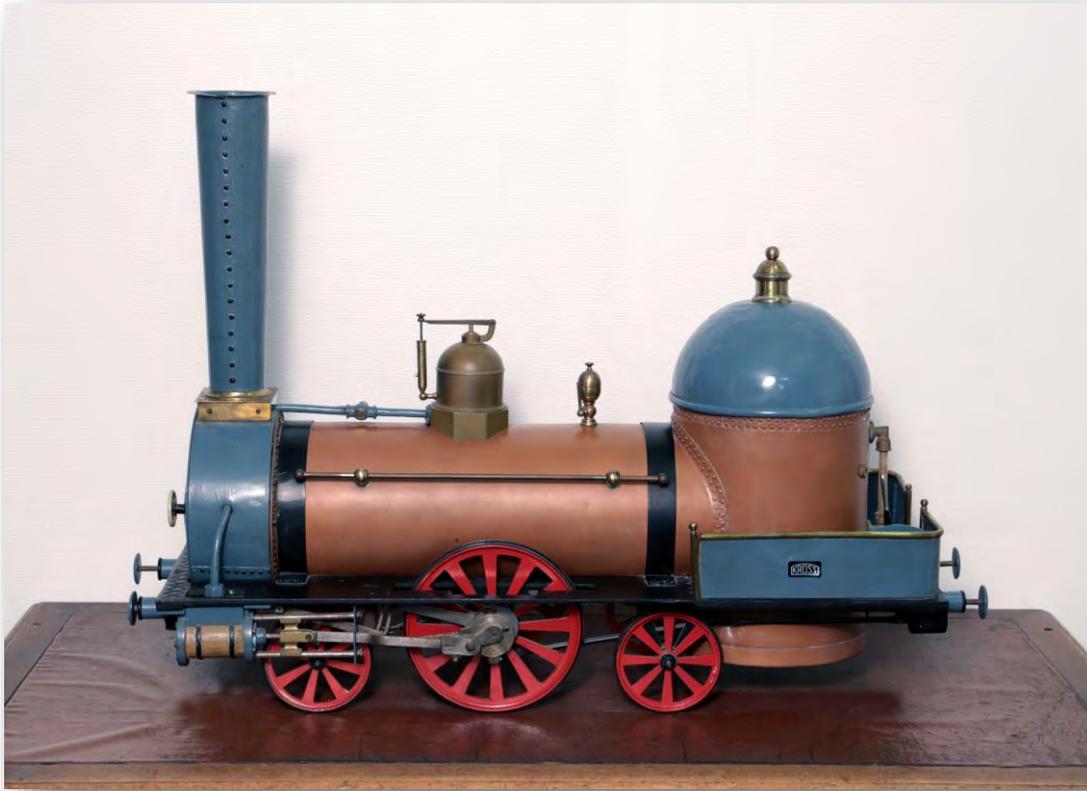


79: Colorimeter head for diaphanometers as per König in approx. 1904



80: *Packer Cäsar Kienert, born 1850, died 1939. A dedicated member of the company staff for 60 years*

Whenever he was in a good mood, Cäsar would allow the children to play with a model railway locomotive. It was a model of the very same locomotive that had been constructed for the King of Siam. From the hallway, a steep staircase led up to the precision-mechanics workshop in which optical instruments of every kind were produced; spectrosopes, for example, or photometers, colorimeters and photographic apparatus. At the window looking down onto the canal stood a long workbench fitted with vices, and behind that a row of foot-operated lathes. A side room was home to a glass-grinding machine, at which an optician ground glass prisms for the spectrosopes. But the most interesting place for little Paul was the shop at the front of the building, just behind the entrance door, in which the optical instruments were sold – a wonderland come true for him. In addition to standard and pince-nez spectacles, the products offered included loupes, reading glasses, small steam engines, magic lanterns, electrical elements and electrostatic generators. A particular source of fascination to the boy was the Edison phonograph with its tinfoil-coated cylinder. When the clockwork mechanism was set in motion, it was possible to speak into the funnel and later hear the sound of one's own voice. On the discovery of X-rays by Professor Wilhelm Conrad Röntgen, the shop also began selling X-ray tubes, which were powered by an induction coil. Almost playfully, therefore, Paul grew up in an interesting and widely varied world of work, one into which he was guided by his elders. And yet, as taken for granted in those far off days, sufficient time for real childhood play was nonetheless granted to him.



81: Model railway locomotive made by A. Krüss, 1.5 m in length, used on the first miniature garden railway in approx. 1846

The children's nannies could therefore often be seen pushing their five prams along the riverbanks of the River Alster and its lake. Back then, there was an inlet at the corner of the streets Alsterglaxis and Alsterufer, filled in 1887 to enable construction of the new bridge named Lombardsbrücke. Here the boys floated their boats, particularly the beloved Heligoland vessel. It was painted white with green and red stripes along its sides. The boys' father had bought it during a trip to the island to bring back as a souvenir and reminder of his ancestral home.

Theirs was a childhood filled with excitement. The so-called "Fleetenkieker" could be observed, for example, those city employees who, after draining the canals, would wade out into the sludge in their high waterproof boots to remove any refuse that had been thrown into the canal waters from the surrounding windows. Fish were still caught in these canals with cast nets which were fastened to the stern of rowing boats.

Seated at the windows of their house at the Adolfsbrücke, the children enjoyed a ringside view of the bustling activities on the adjoining canal.

In his twilight years, Dr Paul Krüss could still vividly recall the canal at Rödingsmarkt, which flowed from the busy street Burstah to the port. This canal had been constructed by Dutch engineers in the style of those in Amsterdam, the so-called grachten. The children's mother often took them with her when she went shopping at the nearby market, Hopfenmarkt. The flat-bottomed ewer boats filled with fruit and vegetables from the Vierlanden region were secured at the wooden bridge and strapping fellows known as the "Hoppenmarkt Leuwen" (Hopfenmarkt Lions) would haul along the baskets.

The following verse in Low German sung by the Hamburg locals immortalises the fisherwomen who set up their stands at the market:

Fischfruun düren un dicke (Fisherwomen both fat and thin)

Sitt ne ganze Klicke (sit in a large group)

Upn Hoppenmarkt. (at the Hopfenmarkt)

Füerkieken unneren Rock, wenn kold is, (a box with glowing coals under their skirts when it's cold)

Füerwehr - un Tollbeamte (Firemen and customs officers)

Stahn an all de Kanten (stand along the canal banks)

Un Konstablars hebbt wie ne ganze Schicht. (and constables fulfil their busy shift)

In the autumn of 1887, Paul was enrolled at the elementary school of the Johanneum, the Realgymnasium high school at Steintor. This huge old edifice was also home both to the Museum for Arts and Crafts, today's MKG and a trade school. Paul's walk to class led him through the streets Rathausstraße, Speersort and Steinstraße. A so-called "Ziehtag" took place once a year on the 1st of November. On that day, the residents of the cramped Gängeviertel district deposited their used bedding straw in the narrow streets where it was burnt. The smoke engulfed the entire Steinstraße and a dreadful stench pervaded the air. *"For twelve long years I trudged along this self-same path, sometimes beset with a guilty conscience, until I finally received my Reifezeugnis school-leaving diploma in September 1899."*

Whilst his classmates went on to study at universities all over Germany, Paul immediately began a traineeship at Dennert & Pape. In doing so, he followed in the footsteps of his father, who himself had also experienced the benefit of preceding a university education with a period of practical training. Paul Krüss was to recall this traineeship with lifelong fondness and gratitude, for it provided him with the craftsmanship skills for the years ahead. At that time (1890), the premises of Dennert & Pape were located in Altona at Friedensstraße No 53. Downstairs there was a carpentry workshop specialising in the production of slide rules and tripod stands for geodetic instruments, whilst the workshop for precision mechanics occupied the 1st floor. The lathes were still foot-operated. As there were no drilling and milling machines, tasks later simplified with their use were still performed at a lathe. Each staff member had to craft the required screw taps, threading dies and screwdrivers for himself. In the year he spent at Dennert & Pape – to be exact from the 1st of October 1899 until the 30th of September 1900 – the young trainee constructed two levelling instruments.

"In some small way it seems that my abilities were inclined towards precision mechanics", he modestly notes in a later recollection of this period. "Moreover, I acquired an excellent level of training. I enjoyed the tasks with which I was entrusted, and a strong spirit of comradeship prevailed – nowadays we would call it working climate. The skills I learnt in that one year were to prove invaluable during my later career".

A fact confirmed in Jena, where Paul Krüss, as one of the tasks required to obtain his PhD in Optics, was able to construct certain instrument parts by himself in the institute workshop. And when he eventually assumed leadership of the family business for precision mechanics, his staff soon discovered that he had acquired quite a mastery in the field, one which earned their highest respect. A strength of which his future father-in-law was also most surely aware. And it is at this point that the history of the Krüss family begins to intertwine with those pioneering men without whose contribution German precision mechanics and optics would not have attained the highest worldwide esteem and standing they now enjoy. Renown for which their names still stand: Zeiss, Abbe, Schott, to mention but a few.

Paul Krüss studied the Natural Sciences – Physics, Mathematics and Chemistry – in Göttingen, Munich and, finally, Jena. From 1903 until 1904, he was an assistant in the Institute of Physics at the University of Jena. It was there that he first met the woman who from now on was to accompany him on Life's journey: Elisabeth Pauly. A name that is indelibly associated with the history of the Zeiss enterprise.

In 1897, together with Professor Ernst Abbe, Dr Max Pauly set up the astronomical department at Zeiss and became its first head. Pauly was undeniably one of the most unconventional men alive at the advent of the 20th century, one whom it is impossible to categorise specifically. Born in Halle as the son of a postal secretary, he very soon revealed his exceptional intelligence and talent. Due to ill health and adversity, however, the young Pauly was first obliged to undertake a mechanical apprenticeship.

How futile it would be in these short lines to provide a full description of his professional development. A pivotal milestone that arose from fortunate circumstances was the opportunity he was given to study in Berlin und Halle. Having obtained his doctorate at the University of Göttingen, he spent almost two decades as the Director of a sugar factory.

Endowed with outstanding technical ability from early on (at the tender age of nine he had already constructed a sundial that also displayed the date of the month!), he added his name to those men who had won immortal fame with their contribution to technical developments in the final days of the 19th century.

Max Pauly's main claim to fame, the one which established his global reputation, was the invention of the "Pauly boiler" – a construction that would prove its worth not only for the sugar industry, in which it reduced coal consumption by no less than 30 %. The limited scope of our chronicle unfortunately does not allow the meticulous portrayal of this man's work that it undoubtedly deserves.

But this much on the topic that concerns us most: Pauly began to focus his attention more and more strongly towards the field of precision mechanics and optics, and the beloved workshop that he ran as a side-line pursuit produced an ever increasing quantity of sophisticated optical equipment. Through the contacts established both with the opticians in Jena and with Dr Schott, Pauly became acquainted with Ernst Abbe, who was to find a congenial counterpart in Max Pauly and the work he performed so selflessly and enthusiastically. Pauly heeded the call to join Abbe in Jena, where, as a partner, he assumed the responsibility of establishing an astronomical department.

By no means did Pauly take this step lightly. In doing so, he relinquished the independent position he had held as the Director of one of Germany's largest sugar factories and was now obliged to come to terms with the relatively dependent role allowed him at the Zeiss enterprise. For this great organiser and entrepreneur, it was certainly not the wisest decision, on the death of Ernst Abbe, to give up his co-partnership rights and instead become a senior official at Zeiss. This notwithstanding, the following one and a half decades were to see Pauly and his staff raise the field of industrial optics to unexpected heights of acclaim in Germany. This blossoming of innovation is intrinsically linked with the name Pauly.

Over and above the studies and initial scientific activities that Paul Krüss undertook in Jena, the town was also the setting in which he first met the woman who would later become his wife. What is more, she came from a family with a particular affinity towards the field of precision mechanics and optics. The young Hamburg citizen could not have wished for a better "dowry".



82: *Dr. phil. Max Pauly, born 1849, died 1917 and Clara Pauly, née Küttner
(Under Prof. Ernst Abbe, Max Pauly was co-owner of the der Zeiss factory in Jena)*



83: *Dr Paul Krüss, born 1880, died 1976
studied Physics, Mathematics and Chemistry in Jena*

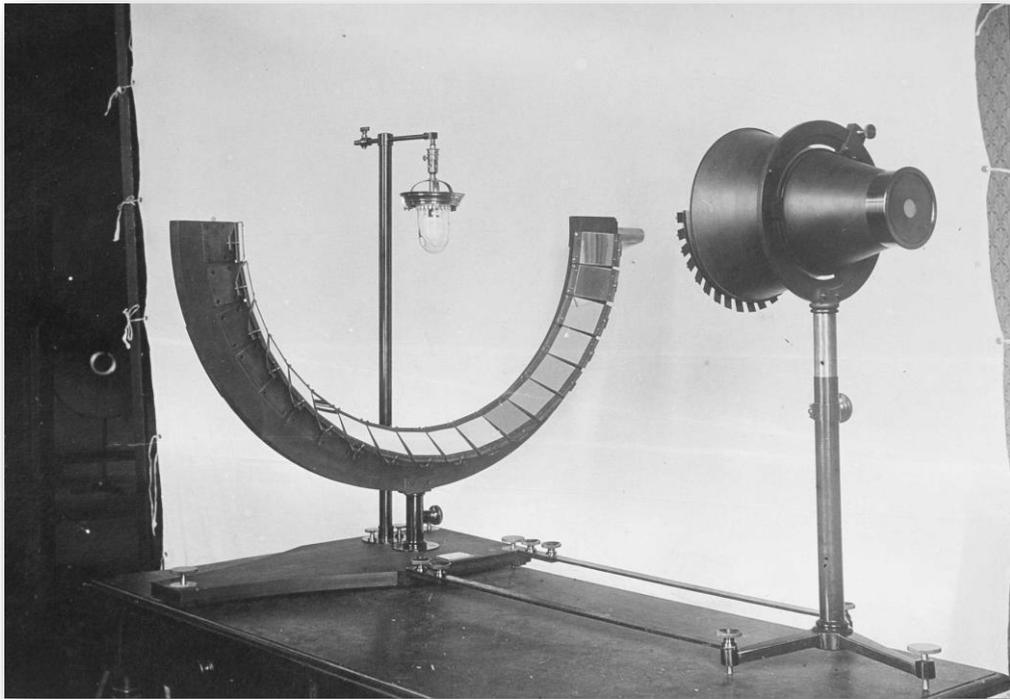


84: *Elisabeth Krüss, née Pauly, born 1887, died 1956*

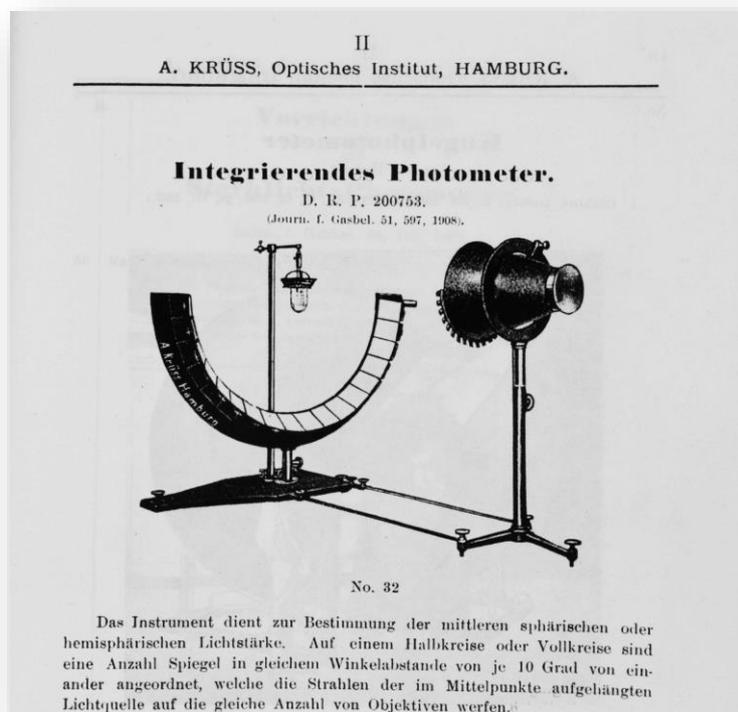
In 1904, he joined the family business and opto-mechanical workshop, now named "Optisch-mechanische Werkstätten A. Krüss". When he married two years later, Paul Krüss was already firmly in charge of the world-renowned enterprise. The sound training and education he had received were to prove invaluable for the company.

As previously mentioned, Paul's father, Professor Dr Hugo Krüss, held an extraordinarily wide range of honorary and scientific consultancy posts. And from early on, his son also assumed numerous offices. Indeed, at only 28 years of age, he was already appointed as Chairman of the Hamburg Society for Precision Mechanics and Optics, a position he held for half a century. In an era that witnessed such enormous technical progress, it was far from easy to resist the temptation of setting out - and possibly stumbling - on the rocky path of ideas arising from customer expectations and the very latest developments. The business and commercial risks involved were especially high, for it was impossible to foresee if and when a scientific innovation would prove successful, one which would benefit a company financially, not ruin it.

Dr Paul Krüss, the master craftsman with a doctoral cap, adopted a pragmatic approach. He was well aware that too great an expansion of business harboured considerable risk. He therefore adhered to the tried and tested family tradition: Creating and fostering a solid team of capable employees who would ensure the unflinching quality of the precision instruments produced by this steadily and continuously growing Hamburger enterprise. Only in adopting this approach would it be possible to maintain and strengthen the worldwide ties, above all with numerous institutes in the scientific sector.



85: With an integrating photometer, individual measurements are used to determine the polar curve of luminous intensity

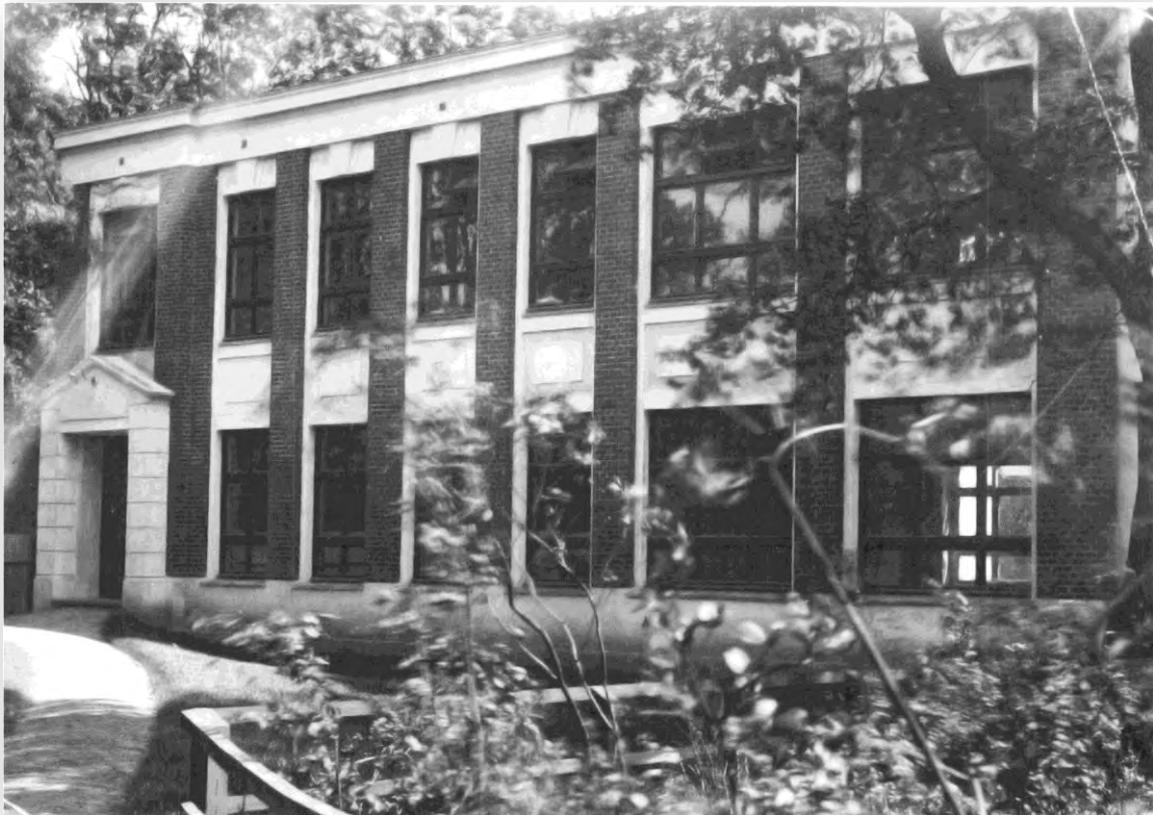


86: The semi-circle of the photometer could be set up with a horizontal or vertical diameter

The Krüss family – The First World War marked a turning point

In addition to epidiascopes, optical instruments, photometers and instruments for use in spectral analysis, the wide range of scientific equipment was extended even further. Yet another branch of business was opened with the manufacture of apparatus for teaching purposes in the field of physics. Of particular importance in this respect was the production of apparatus developed by Professor Grimsehl, Headmaster of the Oberrealschule, a more practically oriented high school located in Hamburg's Uhlenhorst district. Larger epidiascopes were manufactured for use in lecture halls and school classrooms. The extent of this collaboration with the Krüss enterprise is clearly revealed in the famous twin-volume textbook written by Professor Dr Grimsehl.

Designed by Professor Dr Goos at the State Institute of Physics and incorporating features specified by the director of this institute, Professor Dr Koch, a registered micro-photometer was further developed by the Krüss specialists and sold to institutes and laboratories both at home and abroad. The First World War marked a turning point. Although Dr Paul Krüss was initially exempt from military service due to his extreme short-sightedness, less and less consideration was shown towards such disabilities the longer the war continued. In 1916, Paul Krüss was conscripted and dispatched as a so-called Landsturmmann, a type of auxiliary soldier, to the trenches before Verdun. This news was a particularly painful shock for his wife. In addition to the deep concern she felt for her husband, Elisabeth was now left alone in Hamburg with three small children to raise.



87: *The company A. Krüss, Eppendorf branch, Haynstraße 32 a, workshop for apparatus in the field of physics, premises sold in 1919*

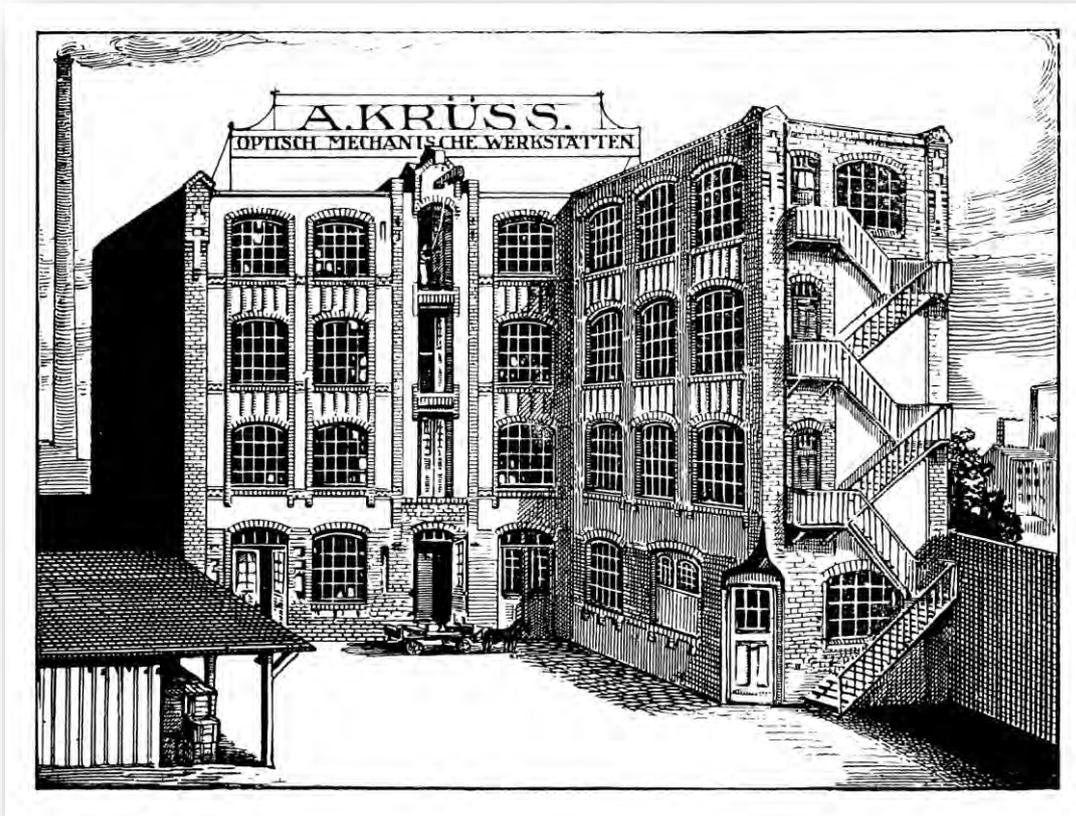


88: Andres Krüss with Lotte, 1917

Only with great difficulty was this sprightly Thuringian-born woman able to settle into her new life in the Hanseatic city; the reserve shown by its residents was difficult to penetrate, and the climate most certainly did not help matters. Her father had sent her a few sapling trees from Jena together with some goats and a shed in which to keep them. The garden behind the house in Groß Borstel into which the family had moved in 1911 provided more than sufficient space for the animals. As a mother, Elisabeth was particularly delighted with Lotte, the nanny goat which provided the milk to feed the son born to her in 1915. In accordance with the long held Krüss tradition, this boy was named Andres. His elder sisters, Elisabeth and Annemarie, born in 1909 and 1911 respectively, were able to play to their hearts' content in the then still tranquil suburb of Groß Borstel. Although Paul Krüss returned home from the battlefields safe and sound, he had nonetheless been compelled to endure a painfully tragic loss: Professor Grimsehl, his fatherly friend, had fallen in combat. The few short years of their collaboration had led to the creation of innumerable training devices, all of which bore the name Grimsehl. It was now imperative that Paul continue this work alone, for the manufacture and ongoing development of such instruments had great future potential. Already on display at the International Exhibition of Brussels in 1897, they had been awarded one of the top prizes. On the 1st of January 1920, Professor Dr Hugo Krüss finally handed over leadership of the family business to his son Paul. As the commercial premises at Adolphsplatz 7 no longer provided the space required by the workshop, the incumbent owner closed down the optical shop. In 1921, business operations were transferred to Gertigstraße, a street in the Winterhude district, at which address it was possible to manufacture optical measuring instruments and physical apparatus on a much larger scale.



89: Hamburg - Groß Borstel, Lokstedter Damm 51, in around 1914



90: Gertigstraße 31, Company Headquarters from 1920 onwards

Expansion and consolidation of the company's business was obviously hampered during the period of hyperinflation in the 1920s. The house at the Adolfsbrücke was sold for a song – or, to quote the German saying, "for a slice of bread and butter". Quite literally in this case, as the new owner was obliged to deliver a kilo of butter at regular intervals. Although this sounds like a joke to our ears today, we should not forget that the value of the Reichsmark was then falling at an ever greater rate. The company staff carried their wages home in laundry baskets. Inflation reached its climax in the autumn of 1923 when one dollar was equivalent to 4.2 billion Deutschmarks. A return to stability only began on introduction of the so-called Rentenmark, a currency backed by land used for agriculture and business, in November 1923. From that point onwards, plans could again be made. The excellent reputation of the Krüss enterprise, the commitment and knowledge of the man at the helm and the solid core of highly qualified employees formed the catalyst for new heights of success and achievement. Despite the move to the larger premises at Gertigstraße 31, the Krüss enterprise with its workshop for opto-mechanics remained firmly devoted to skilled and quality craftsmanship. Each of the precision mechanics was thoroughly familiar with the machine he operated, its inherent failings included. In the following years, operations were predominantly centred on the construction of spectral apparatus. The purpose of such instruments was to reveal the composition of substances on the basis of their respective spectrum. They were particularly suited for use at schools and physical-technical colleges. In these and the ensuing years, they accounted for around 60 % of the company's turnover. As regards the precision of these instruments, extremely accurate value measurement was ensured, a factor of crucial importance to the customer.

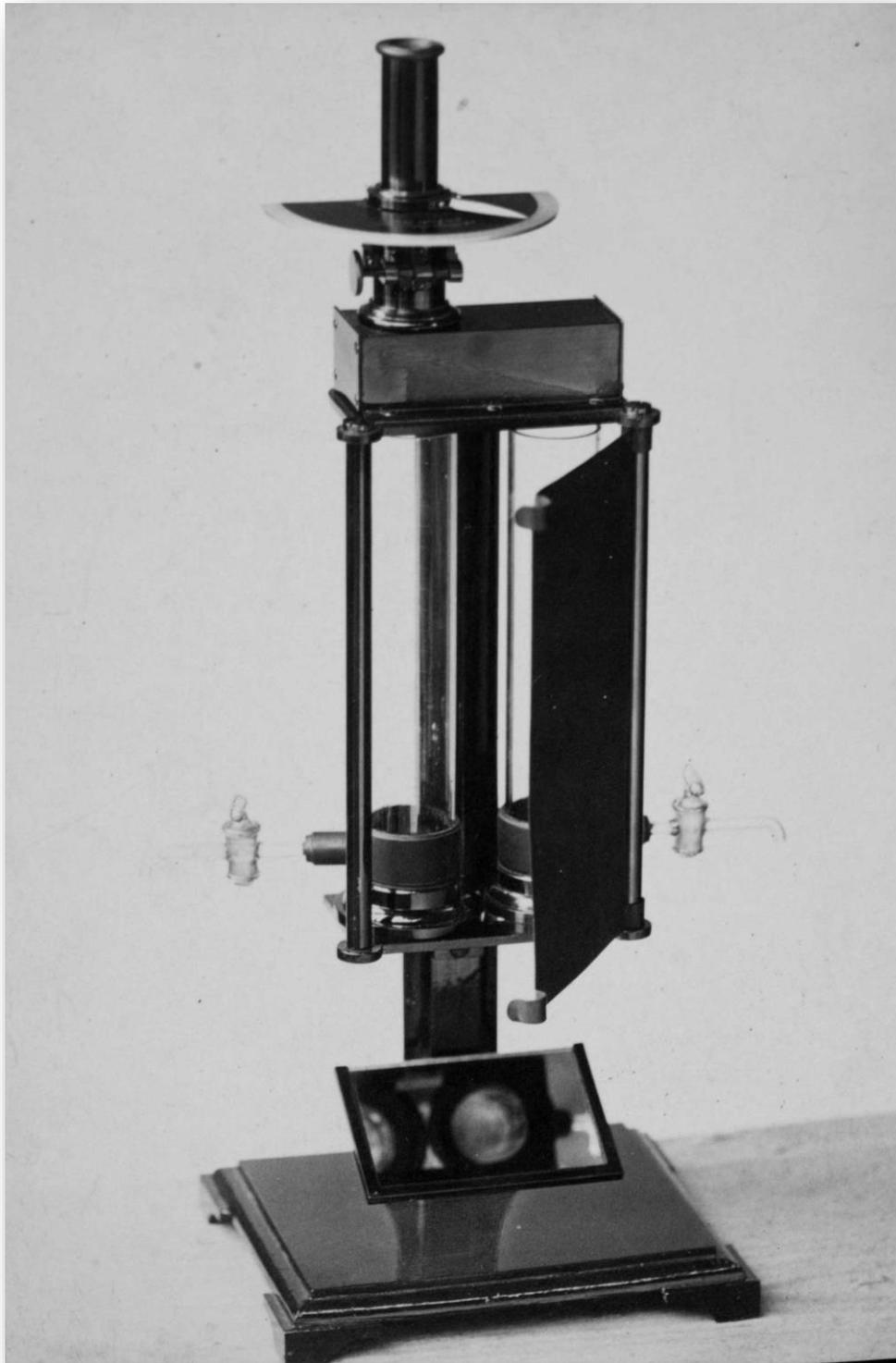


91: *Company staff in 1922*

Still dependent on foot-operated machines in the 1920s, the company's products were eventually manufactured with transmission, in which case the main shaft was mounted above the floor and driven by a main motor. The instruments were produced in their entirety in Gertigstraße, at which premises the surface treatment was also carried out. Only the optical equipment was procured externally – this since the turn of the century, when Prof. Hugo Krüss discontinued the manufacture of such products so as to avoid competition with Messrs. C. A. Steinbeil & Sons in Munich, the company at which, after all, he had worked as an unpaid trainee and acquired the skill of grinding optical glass! The range of spectroscopic instruments comprised spectrosopes, spectrometers, spectrophotometers, quartz spectrographs, prisms, diffraction gratings, light filters, cuvettes and light sources for emission and absorption spectra.

In addition to these spectrographic instruments, particular importance was attached to the range of optical colorimeters. The key strength of this small but agile enterprise was firmly grounded in its collaboration with independent scientists or departments of state-owned institutes. The numerous instruments created in this way often bore the names of the scientists concerned.

The methods underlying the field of colorimetry are applied for quantitative determination of all soluble coloured bodies and also of such colourless compounds that can be transformed into coloured compounds when a reagent is added. Above all, colorimetric methods are adopted whenever a coloured body is to be quantitatively determined as fast as possible; but also when the minimal quantity of the body to be determined or the difficulty posed in isolating the coloured substance seemingly rule out the use of a more exact alternative method of determination. In all such cases a colorimeter provides invaluable support when the chemist is performing an analysis.



92: Krüss polarisation colorimeter with prisms designed by Grosse

Colorimeters are used to determine the value of aniline dyes, the decolouring power of bone black, the value of the salicylic-acid content in absorbent-cotton dressings, for quantitative determination of minimal amounts of copper, tin, lead, manganese, titanium, cobalt, uranium, etc., as well as for determination of the ammonia and nitrous acid contained in water. Yet this is only the tip of an iceberg in view of the many other areas of application.

The Krüss enterprise had already begun manufacturing optical colorimeters at the Adolphsbrücke premises in 1915, at the height of the First World War. In the following years, this group of instruments would become a solid bedrock for the company. The range encompassed colorimeters as developed by Jules Duboscq, spectro-colorimeters, polarisation-colorimeters and colorimeters as designed by Karl Stammer for use with mineral oil and syrups, across to micro-colorimeters, nephelometers, micro-nephelometers and diaphanometers. The epithet "as designed by Krüss" embossed on some of these instruments reveals the extent to which Dr Paul Krüss had been involved in the development of such equipment. A noteworthy example is provided by the Krüss-developed polarisation-colorimeter, one of the most popular colorimeters at the time, which demonstrated exceptional measurement accuracy. Production of these instruments continued until 1980, as was also the case with the third largest product group, the photometers.



93: Dr Paul Krüss, together with Workshop Manager Heinrich Thormann, surrounded by the Krüss team, 1926

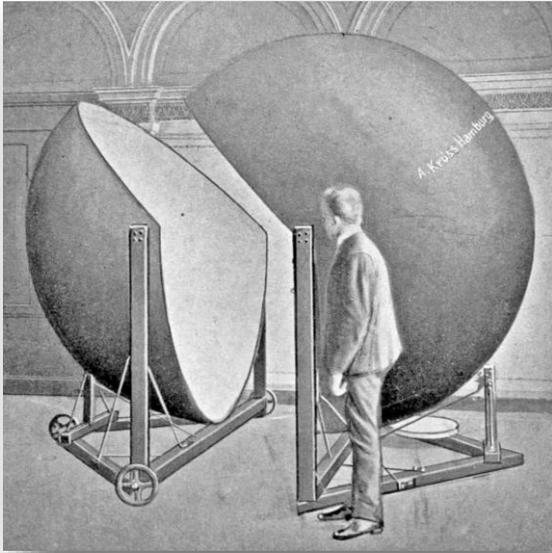
The names given to the latter instruments again reflect the close spirit of collaboration that bound the Krüss enterprise with scientists at state-owned institutes. Of major importance in this respect were the bench photometers and, above all, the globe photometers, also both manufactured in practically unaltered form over a lengthy period of time.

Photometers are used to measure the luminous intensity of light sources. Over the years, the range of products manufactured at the Gertigstraße premises comprised bench photometers, photometers as developed by Lummer & Brodhun, by Weber and by Weber-Voege, incandescent light-bulb photometers, globe photometers, the universal luxmeter as developed by Voege, the already-mentioned registering micro-photometer as developed by Koch-Goos, the coordinate-measurement apparatus as developed by Goos and photoelectric luxmeters. Globe photometers were constructed for various measurement objects of differing size with a diameter of 0.10 m for the smallest bulbs up to 3 m for fluorescent tubes. These enormous globes could only be produced in accurately calculated segments which were cut out in accordance with marked outlines and pre-rolled. The segments to be combined were then spot-welded and riveted together in $\frac{1}{4}$ parts. A precision mechanic had to position himself in the interior of this enormous globe in order to apply counter pressure during the riveting process, whereby a quite substantial level of noise was created within the hollow cavity. As the size of the globe often exceeded the dimensions of the workshop on the second floor, the manufacture of a 3m globe made it necessary to swing out an entire window wall in order to lower the globe down into the courtyard by means of a winch.

Within the group of photometers, particular importance was attached to the photoelectric registering micro-photometer. For many years it took pride of place in the Krüss product range, enjoying worldwide popularity and major recognition in international expert circles. Constructed in accordance with the specifications of Professor Koch, the Director of the State Institute of Physics in Hamburg, this device underwent constant further development.

Registering micro-photometers were used for the measurement and registration of photographic blackening. Their main areas of application: The evaluation of line spectra and Roentgen spectrograms for the purpose of material testing and the measurement of stellar spectra, as well as control of the blackening of the sound tracks on film copies. This product group also includes the registering micro- and iris-diaphragm photometer as developed by Heinrich Siedentopf. Production began in 1928 and continued until ten years after the end of the Second World War. The demands imposed on the precision of this apparatus were exceptionally high and could only be met through the supreme quality workmanship of the precision mechanics. At observatories both at home and abroad where, even today, these instruments are still in occasional use, the Krüss-manufactured micro-photometers were rated in the most glowing terms. As confirmed in the appraisal given by Yale University, New Haven, U.S.A.: *"The instrument has been put in use and appears entirely satisfactory"*.

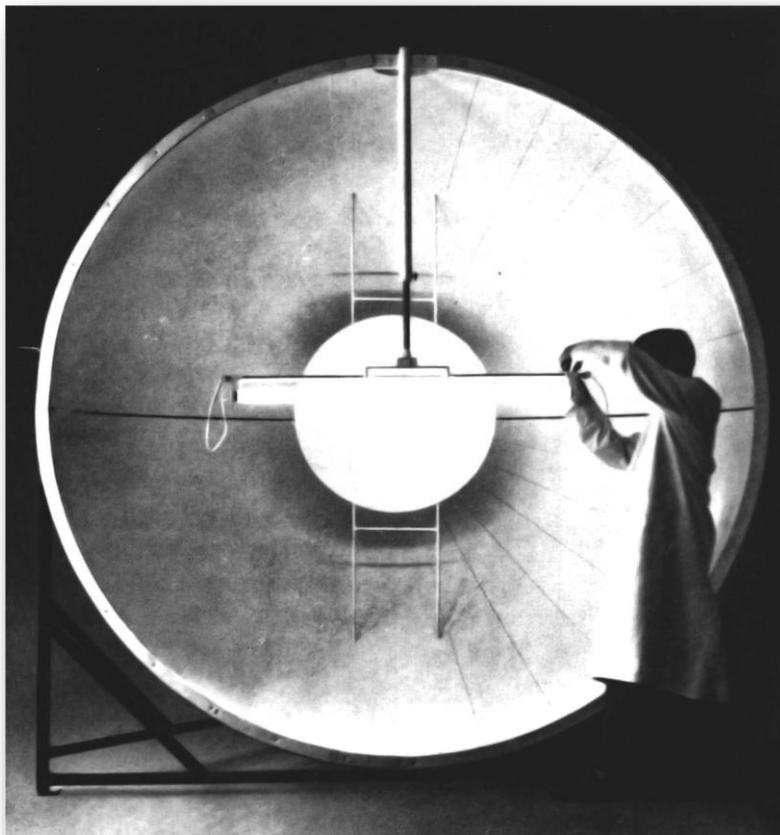
A specially designed version was produced for the Hamburger Observatory and, as a further point of note, Russia was the principal customer for these instruments until its entry into the Second World War. For many years, too, Hefner lamps, the primary standard, so to speak, from which all later and more modern light units are derived, was also manufactured at the Krüss workshop. When no longer required officially, these lamps were nonetheless still in frequent use for demonstration and comparison purposes due to their ease of operation.



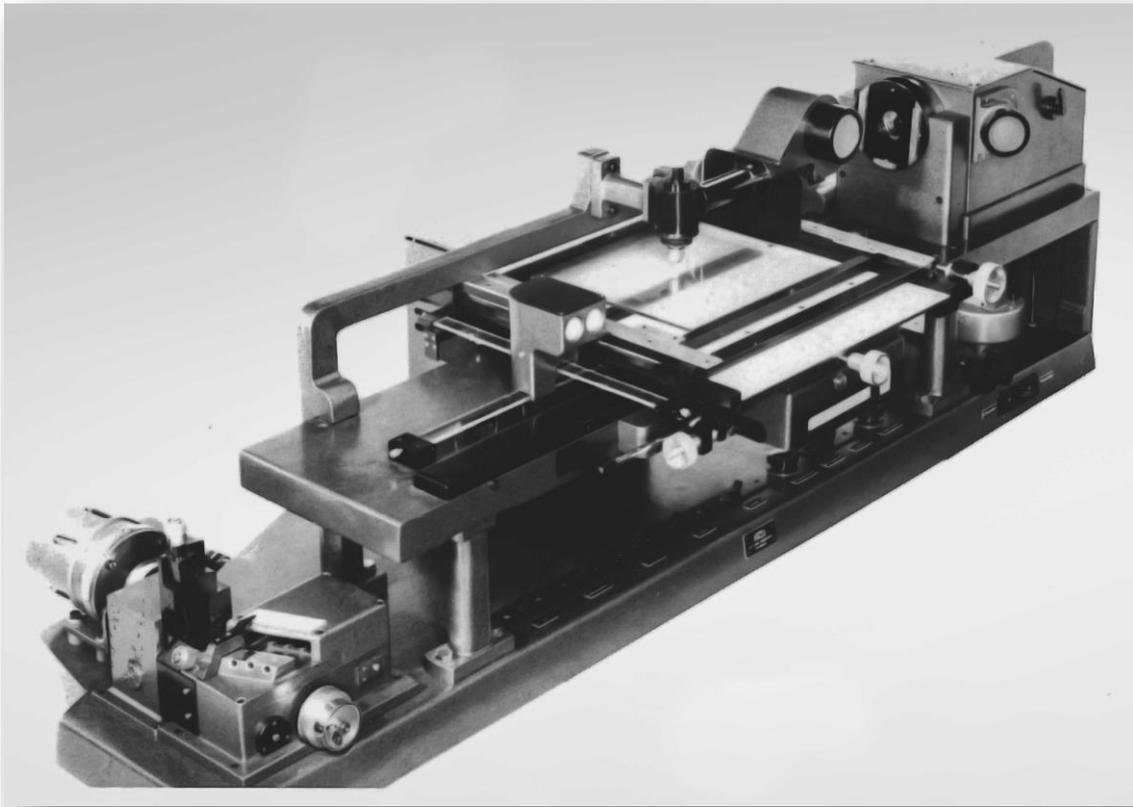
94: Photometers were produced in segments.



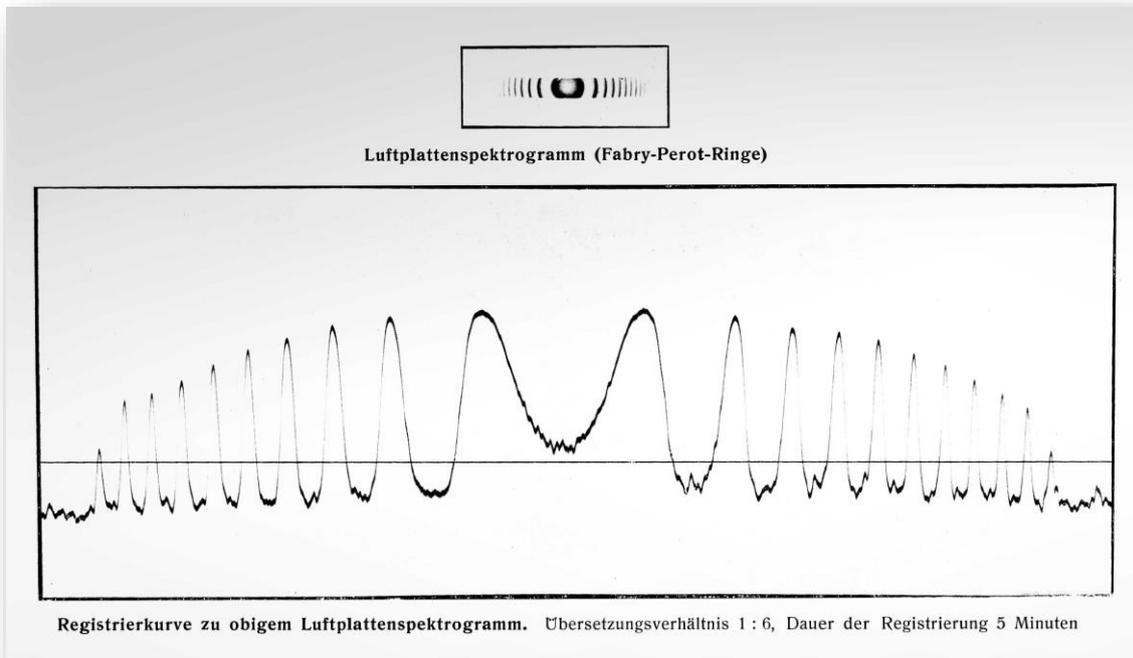
95: $\frac{1}{4}$ globe segments were spot welded and riveted together



96: Photometer globe for the measurement of spatial light distribution.
The range on offer included models with diameters of between 10 cm up to 3 m



97: Registering micro-photometer, the showpiece of the company. Production began in 1928 (Photo from 1950)



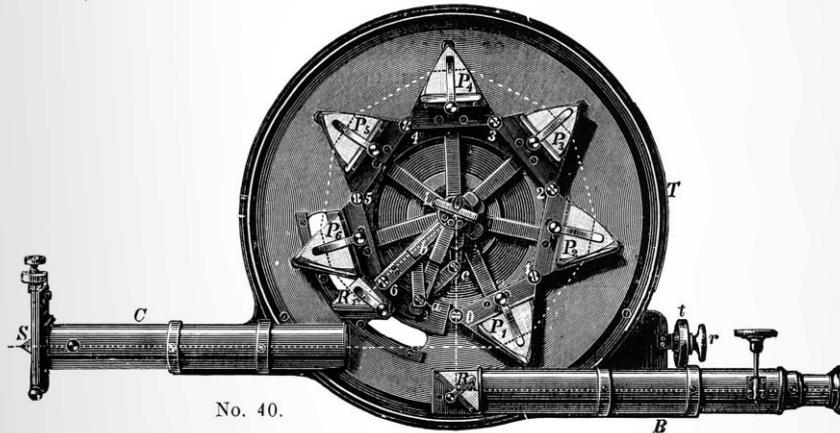
98: Registration curve, air-plate spectrogram

I

A. KRÜSS, Optisches Institut, HAMBURG.

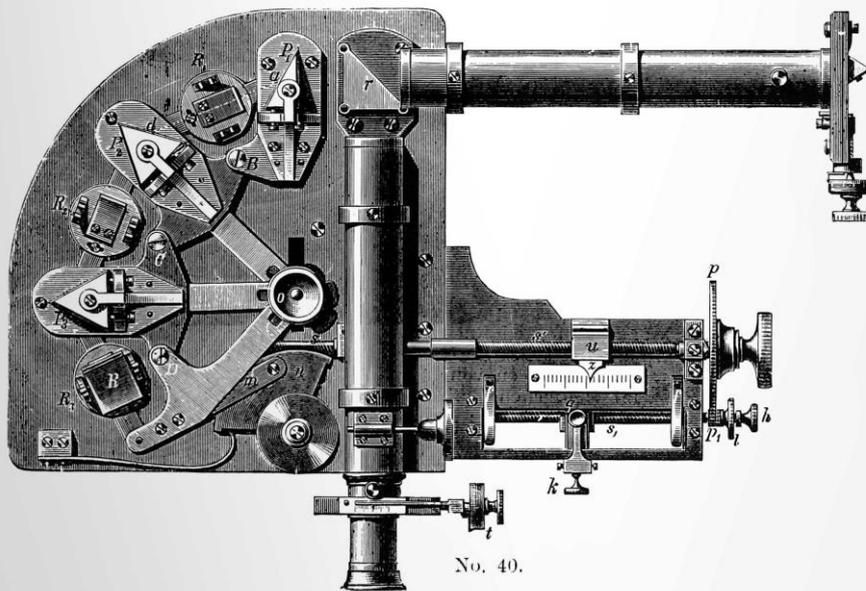
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No. 40.

- 40 **Spektral-Apparat mit automatischer Einstellung.** Mit 6 Prismen von 60° und 60 mm Öffnung mit festem Beobachtungsfernrohr 1400.—
(Ztschrft. f. Instrk. 8, 388, 1838)



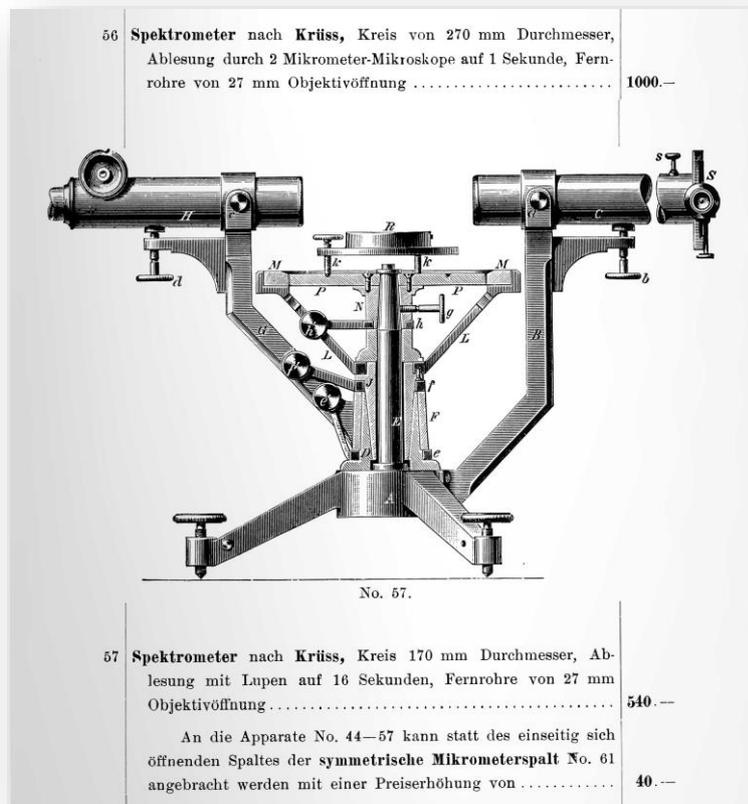
No. 40.

- 41 **Spektral-Apparat mit automatischer Einstellung der Prismen und Rückkehr** der Strahlen durch ein rechtwinkliges Reflexions-Prisma. Kollimator- und Beobachtungsrohr beide fest. Mit 3 Prismen, 30° , 60° , 60° , wirkend wie ein Spektroskop von 1, 3 oder 5 Prismen. Dimensionen des optischen Teiles wie bei Apparat No. 4, die Prismen jedoch von doppelter Höhe 1350.—
(Ztschrft f. Instrk. 5, 183, 1885.)

99: The Krüss range of spectral apparatus comprised spectroscopes, spectrometers, spectro-photometers, quartz spectrographs, prisms, diffraction gratings, light filters, cuvettes and light sources for emission and absorption spectra



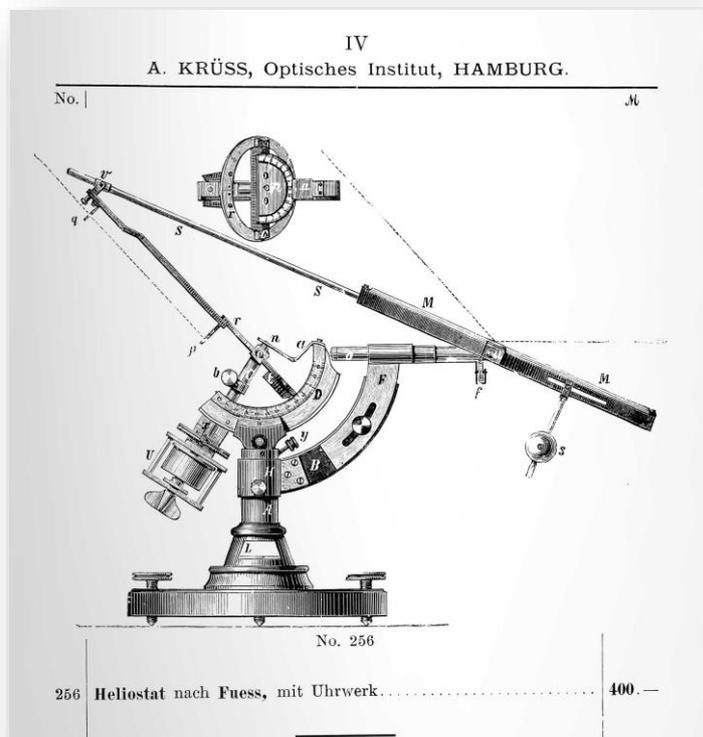
100: Krüss spectrometers included the model developed by Lang and spectrometers for educational purposes



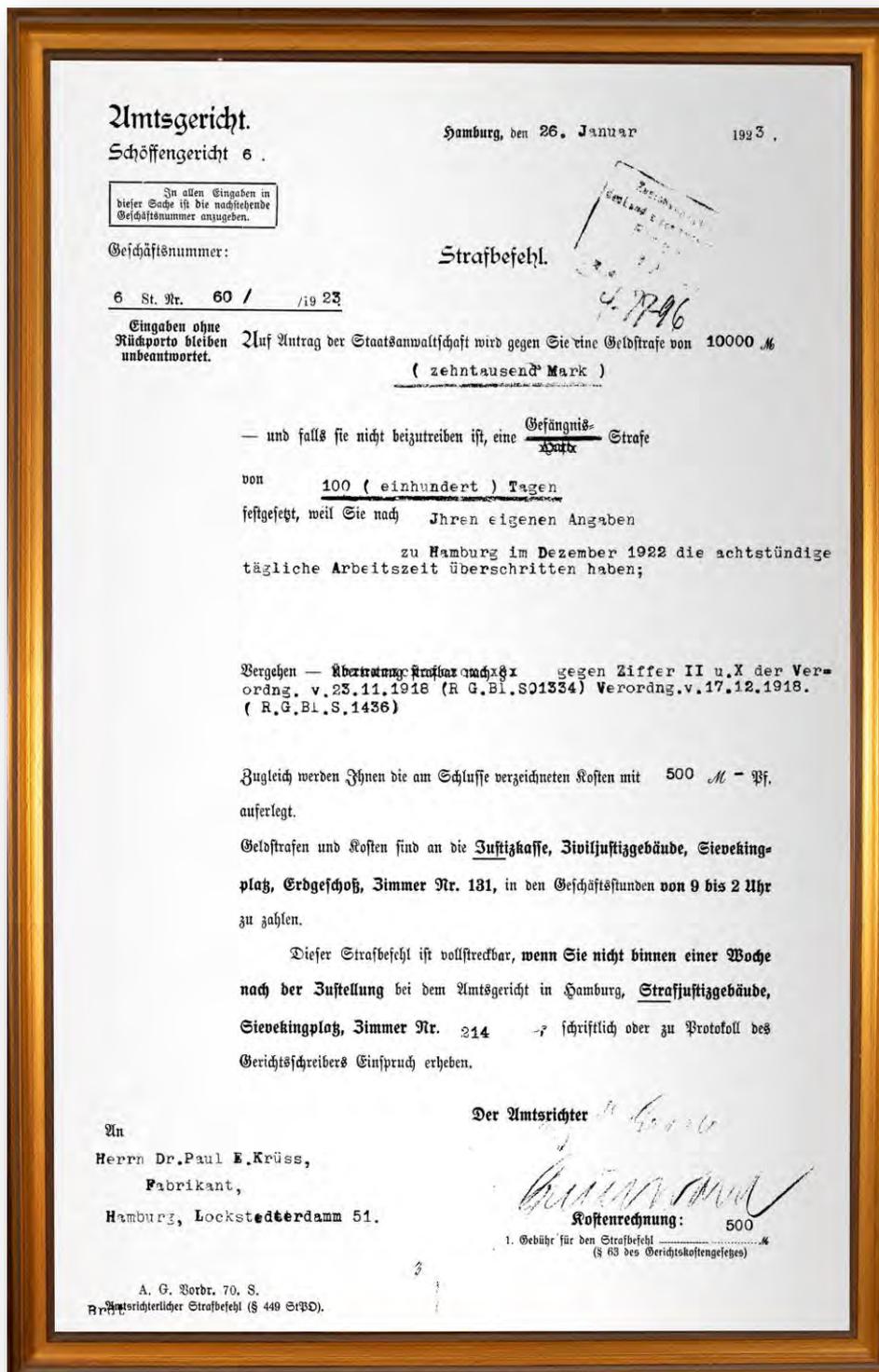
101: Spectrometer designed by A. Krüss and included in the company's general product catalogue



102: In the 19th century, the heliostat was used for optical experiments with natural sunlight. Such instruments are still used at solar power plants or to brighten dark mountain valleys in wintertime



103: Heliostat as developed by Fuess



104: Prison sentence almost imposed on the Company Owner Dr Paul Krüss for allowing unauthorised overtime working hours!



105: Private office at Gertigstraße in 1936

The range of cathetometers, which also included telescopes for reading, did not contribute significantly to overall turnover. The market was covered by larger industrial enterprises. Such instruments nevertheless remained part of the Krüss product range for decades. Ensuring the highest level of precision, Model 650 with its ocular micro-meter and binocular telescope was a specially produced version which had already been launched onto the market in the early 1920s.

In contrast, however, a major contribution to overall turnover in the years between 1920 and 1936 was achieved with teaching apparatus for use in the field of physics. As previously mentioned, this product group had been developed by Dr Paul Krüss in collaboration with Professor Grimsehl. The range manufactured comprised demonstration apparatus, instruments for training in physics, universal arc lamps, teaching apparatus in the electrical field, and resistors for experimental purposes. From 1935 onwards, particular importance was attached to those instruments within this group, originally designed by Professor Schütt, which centred on the physics of aviation. At this point we should turn our attention to the economic situation in the early thirties of the last century. As was the case at so many companies, the Krüss enterprise also suffered a downturn in sales due to the severe economic crises. This is confirmed in the following excerpt from a letter written by Paul Krüss to his brother Hugo in January 1932:

"... I can well use the best wishes you have extended with regard to the business situation we are currently facing. The last two years have unfortunately seen almost total evaporation of my working capital. Were I to go into liquidation today, I would be left with an empty purse. Since October, the business has only opened on two days each week, during which we do not earn enough even to pay the expenses we incur.



106: Dr Paul Krüss at his desk in 1950

Although I have received a relatively large number of orders, they cannot possibly be fulfilled on time as I do not have money enough to pay for the overtime hours my staff would need to perform. I still require M 10,000 as working capital, an amount that cannot be obtained at present"

Anyone other than Dr Paul Krüss would most probably have long since thrown in the towel. But not only was his own existence at stake, the staff he employed faced the same predicament. At no time was the rigorous dismissal of staff without notice ever seen or adopted as a solution, however.

With its many years of experience and ability, the company workforce provided invaluable capital of another kind. In addition, strong personal ties existed between Krüss and his team of specialists at an enterprise so fully devoted to quality craftsmanship, one which survived and nonetheless withstood the upheavals that occurred after 1933. The distinction between industrial mass production and skilled craftsmanship was arbitrarily determined by the new political rulers. Companies employing a staff of up to 200 employees were classified as craft enterprises, set apart from industrial undertakings more focused on series production. Great efforts were made by other craft enterprises of a similar nature to gain a foothold in the gradually expanding armaments industry. As a specialised craft enterprise with a staff hardly exceeding 30 employees, Krüss was not able to keep pace to this extent, the series under construction being too large. Expansion per se was neither possible nor desired, an approach that would later prove enormously beneficial. By way of ministerial decree, however, an opportunity was provided of teaching aeronautical physics as a school subject.

The last years before the Second World War

This was expressed as follows: "At school, every young German is to be familiarised with the physical principles underlying the field of aeronautics. Here too, successful teaching can only be provided on the basis of direct observation and experiments. The objective of such teaching cannot be achieved unless the required equipment has been procured!"

The Krüss enterprise readily seized the opportunity of venturing into this new area of activity, particularly as it had obtained exclusive authorisation from Professor Schütt to manufacture and distribute his instruments in compliance with the original models described in his book "Einführung in die Physik des Fliegens" ("Introduction to the Physics of Flight"). A catalogue published in those years listing the products Krüss could offer includes 47 individual devices in this category alone. The range was augmented with two-component scales as developed by Dr Keutel and the Höri projector as developed by Dr Berlage.

In 1934, yet another product innovation was added to the range: the erythrocytometer. Krüss developed this instrument for practical clinical purposes in collaboration with Dr H. E. Bock, then an assistant physician at the St Georg General Hospital in Hamburg. With its aid, the average diameter of erythrocytes could be determined fast and simply. It provided invaluable aid to medical assessors and at polyclinics, psychiatric hospitals or other medical institutions. The design of this instrument remained virtually unchanged for decades until competition was encountered from electronically operated large-scale apparatus, which no longer justified continuation of its production.

For many more years, however, the values measured with the electronic equipment were still verified using the simple erythrocytometers as developed by Dr Bock. Indisputable confirmation of the precision with which work was performed at the Gertigstraße premises. A fact that was taken into account with pride.



107: Walter Mahler, Workshop and Production Manager 1925-1976

Shortly before the outbreak of the Second World War, the design of tensiometers was commenced in collaboration with Dr F. Seelich from the Institute for Physicochemical Medicine at Kiel University. These devices are used to measure the surface tension of liquids. Walter Mahler, the Workshop and Production Manager at the Krüss enterprise, was a keen proponent and strongly encouraged their development. Even then he was aware of the immense future importance of this range of instruments.

Extremely close and regular contact was established between Hamburg and Kiel. The first device enhanced with a light-pointer readout as per Dr F. Seelich was approved by the Kiel institute. In return, assurance was given that this upgraded version would bear the inscription "New improved model as developed by Dr F. Seelich". Further confirmatory approval was obtained from the Institut Pasteur in Paris thanks to the initiative of Dr Seelich, formerly employed at this institute for many years. The objection lodged by the the American company Cenco with regard to the production of tensiometers as developed by Lecomte du Noüy was dismissed in Germany.

As had previously been the case with Professor Dr Hugo Krüss, his son, too, assumed a growing number of honorary offices and tasks. Soon after the First World War, Dr Paul Krüss was appointed as Chairman of the Department for Precision Mechanics within the Employers' Association of Industry and the Trades in Hamburg-Altona. For many years he also served as a member of the Hamburg Chamber of Industry and Trade and as Chairman of the Examination Board for Master Craftsmen in the field of Precision Mechanics.

Particular merit is due to Dr Paul Krüss on account of his initiative and achievement during the 1930s, when the National Socialists banned almost all economic groups, institutes, affiliations and other associations. This led to dissolution throughout Germany of the branch associations for precision mechanics and optics. As Hamburg also faced this threat, the corresponding society chaired by Dr Paul Krüss since way back in 1908 feared the worst. And yet he succeeded in ensuring the survival of this branch association as the only one of its kind in Germany.

The Hamburg Society for Precision Mechanics and Optics was home not only to larger industrial undertakings, but also to smaller enterprises maintaining the highest standards of individual quality craftsmanship. With skill and commitment Dr Paul Krüss, the master craftsman with a doctoral cap, continued to successfully lead the association through this stormy period in its history. He was also appointed as Grand Master of the Guild of Precision Mechanics, remaining an honorary member after 1954.

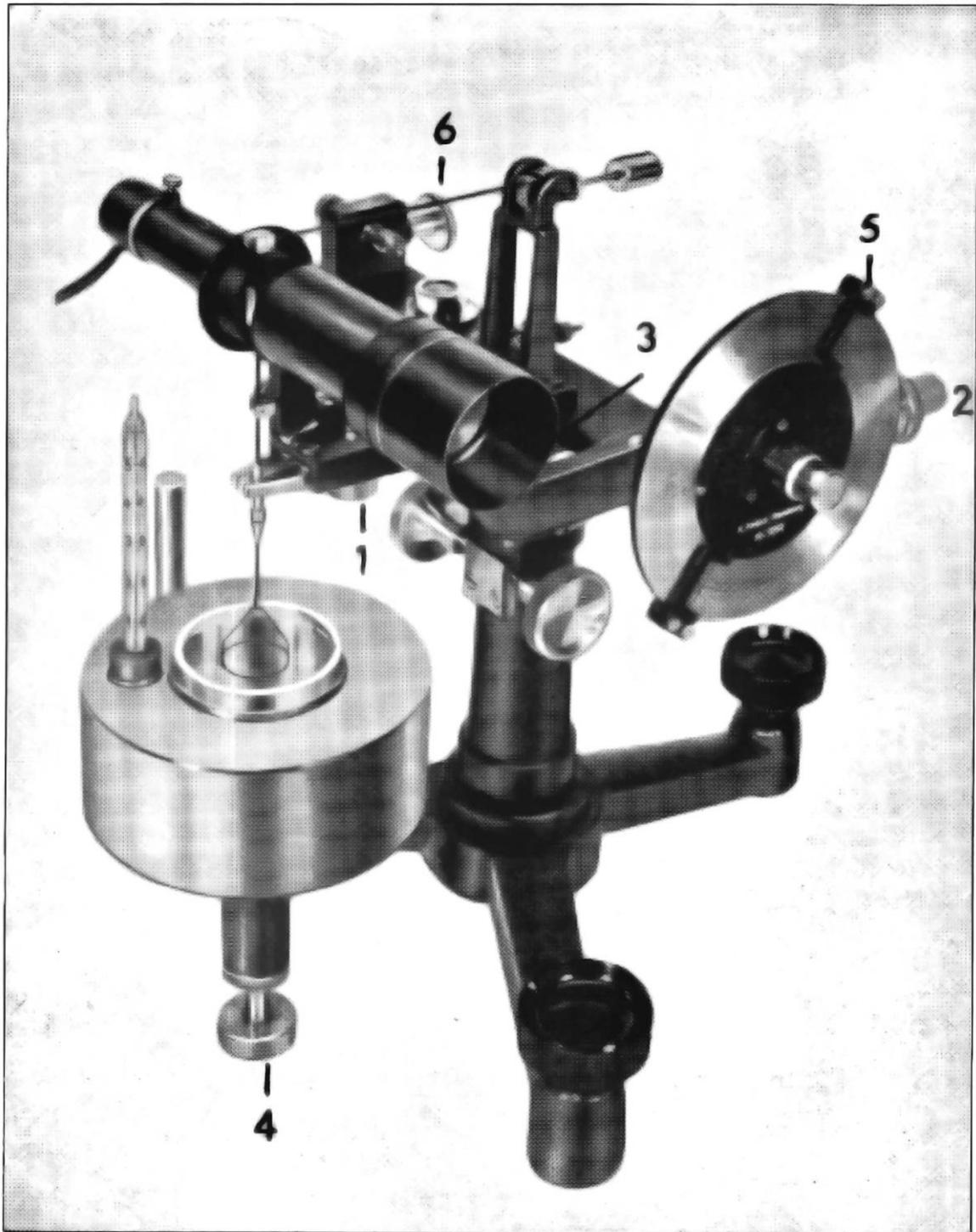
What do we know about him personally? A later laudation praises the inner wealth of character with which Life had blessed this man, not only professionally, but also in his recreational pursuits. Deeply grateful for these inner riches, he strove to pass them on to others. A keen collector of postage stamps, he found great pleasure in the field of philately. His house in Borstel was also home to an impressive library, for he had acquired a passion for studying rare books. After all, his elder brother Hugo was the Director of the Prussian State Library in Berlin.

Outwardly, Dr Paul Krüss came across to the uninitiated as aloof, almost withdrawn. Only his family, friends and staff knew that, masked by a stern expression, he was not only warm hearted and willing to help without fail, but, what is more, a lover of the fine arts; he also composed poetry. The following lines, written in his later years, reveal Paul Krüss as a soul in love with Life and Nature.

AUTUMN

*When aster and dahlia are in bloom,
When the swallow wings her way to places afar,
When blueberry and creeping vine radiate their purple splendour,
When the red heathland
reverts to its dull coat of brown,
Then autumn has returned, and the time is nearing
when the Earth shall slumber beneath her winter blanket
And, in trepidation, anxious souls begin to ponder,
When will my winter herald its arrival?
Then, with raised hands, let us voice our yearning
for the strength to weather the ominous turning point ahead,
Let us look forward to the return of many a spring,
When forest and heathland, meadows and pastures
shall once again shine in renewed glory,
When our bounteous Mother Earth
shall again proclaim her eternal exhortation "Live and prosper".
A cheerful heart will help you bear
all pain, all suffering without complaint,
And, at day's end you will gratefully recall
the simple joys that afforded you peace.*

Paul Krüss, October 1953



108: Interfacial tensiometer as developed by Lecomte du Noüy.

The process of removing a submerged measurement ring of defined size from the surface of a liquid was a groundbreaking innovation for determination of the surface tension of liquids!

This instrument served as a benchmark for continual ongoing development of Krüss measurement devices of this type



*109: Dr Paul Krüss, born 1880, died 1976
Managing Owner of the company 1920-1976
1. Chairman of the Hamburg Society for Precision Mechanics and Optics (1908-1958)*

And yet another fresh start

Although the First World War had already left deep scars, the unconditional German surrender in the spring of 1945 seemed to spell the final end for the Hanseatic City and its commercial life and industry. Hamburg lay in ruins. And although the city had emerged relatively unscathed from the horror of the First World War, the devastation that had recently been caused by the aerial bombardment was all too visible.

After Lübeck, Hamburg was the first major city within the German heartland that had been turned into a battlefield. The aerial attacks that took place between the 24th and 30th of July 1943 were but the tip of an iceberg, and an estimated 55,000 men, women and children perished in the hail of bombs and resultant firestorm. When hostilities finally ceased in 1945, no more than around 130,000 apartments remained undamaged - of a 563,000 total at the outbreak of the war.

It was nothing short of a miracle that the Krüss business premises in Gertigstraße were still intact, the rest of the district having suffered enormously in the bombing inferno. To a large degree this was due to the selfless dedication of certain members of staff who risked their lives in protecting the building, extinguishing fires and preventing more extensive damage.

Now aged 65, Dr Paul Krüss had led the enterprise through the war years with undiminished prudence and skill, by no means a simple task. Due to additional compulsory wartime recruitment, the company workforce had increased to a total of around 40 men and women. These temporary employees were now given notice and only the original core team remained.

Mitteilungen für die Zivilbevölkerung

Befehl der Militärregierung betreffend Ausgabe von Lebensmittelkarten

I. Alle Männer vom vollendeten 18. bis zum vollendeten Lebensjahre (geboren zwischen dem 20. Juli 1890 und dem 19. Juli 1927), die in Hamburg polizeilich gemeldet sind, erhalten am 19. und 20. Juli 1945 nur dann Lebensmittelkarten für die nächste Zuteilungsperiode, wenn sie oder ihr Beauftragter eine Bescheinigung auf besonderem Vordruck bei der Kartenausgabe abliefern.

II. Die Bescheinigungen werden ausgestellt: in doppelter Ausfertigung:

- für alle beschäftigten männlichen Arbeiter, Angestellten und Beamten (einschließlich Landwirtsöhne, Meistersöhne, Lehrlinge) von den Betrieben oder Verwaltungen; eine Bescheinigung darf nicht ausgestellt werden an Männer, die länger als drei Tage ohne Entgelt in Urlaub sind und nur zu dem Zweck in den Betrieb zurückkehren, um die Bescheinigung vom Betrieb zu erhalten, und nach kurzer Zeit wieder in unbezahlten Urlaub gehen.
- für alle männlichen selbständigen Berufstätigen und Angehörigen der freien Berufe von der zuständigen Berufsvertretung, und zwar:
 - für alle Gewerbetreibenden von ihrer zuständigen Fachgruppe,
 - für alle Angehörigen des Reichsnährstandes vom Ortsbauernführer,
 - für Rechtsanwälte, Ärzte und Apotheker von der zuständigen Kammer,
 - für Kulturschaffende von der Kulturverwaltung, Kunsthalle;
- für alle von der Sozialverwaltung betreuten männlichen Erwerbsunfähigen von den Ortsämtern;

in einfacher Ausfertigung:

- für alle übrigen Männer von den zuständigen Dienststellen des Arbeitsamtes.

Hierunter fallen auch die von den Betrieben länger als drei Tage ohne Entgelt beurlaubten Männer. Eine Bescheinigung darf in diesem Falle nicht vom Betrieb ausgestellt werden.

III. Für alle männlichen beschäftigten arbeitsbuchpflichtigen Arbeiter und Angestellten unter 18 und über 65 Jahre, die in Hamburg polizeilich gemeldet sind, haben die Betriebe

oder Verwaltungen die gleiche Bescheinigung in doppelter Ausfertigung auszustellen. Jedoch die erste Ausfertigung unmittelbar dem Arbeitsamt Hamburg, Hamburg 1, Ferdinandstraße 5, 3. Stock, Zimmer 314, spätestens zum 31. Juli 1945 einzureichen und die zweite Ausfertigung dem Beschäftigten auszuhändigen.

IV. Vordrucke für die nach Ziffern II und III ausstellenden Bescheinigungen sind ab Sonntag, dem 8. Juli 1945, bei den Dienststellen des Arbeitsamtes und den Ortsämtern kostenlos erhältlich.

Die Betriebe und Berufsvertretungen haben sich so rechtzeitig mit Bescheinigungsvordrucken zu versehen, daß sie die Bescheinigung noch vor dem 19. Juli 1945 ausgeben können.

V. Die erste Ausfertigung der Bescheinigung wird von den Dienststellen des Ernährungsamtes an das Arbeitsamt zwecks Nachprüfung und Auswertung weitergeleitet. Die zweite Ausfertigung ist vom Inhaber ständig als Ausweis bei sich zu tragen und bei Besichtigung des Beschäftigungsverhältnisses vom Betrieb wieder einzuzeigen.

VI. Die Betriebe, Verwaltungen usw. sind verpflichtet, bei Neueinstellungen von Männern ihnen die als Ausweis dienende zweite Ausfertigung der Bescheinigung auszuhändigen.

VII. Ab 21. Juli 1945 erhalten nach Hamburg zuziehende Männer nur dann Lebensmittelkarten, wenn sie ebenfalls eine solche Bescheinigung vorlegen.

VIII. Wer unberechtigt nicht beschäftigten Personen Bescheinigungen über eine Beschäftigung ausstellt oder sich eine solche ausstellen läßt, wird nach den Gesetzen der Militärregierung bestraft.

Vor dem Militärgericht

In einer Sitzung des Obersten Militärgerichts am 29. Juli im Strafjustizgebäude Hamburg wurden folgende Fälle verhandelt: vier Fälle wegen ungesetzlichen Besitzes von Feuerwaffen. Eine Strafe von zwölf Jahren Gefängnis, eine Strafe von fünf Jahren Gefängnis, eine Strafe von fünf Jahren Gefängnis, ein wurde freigesprochen. Ein Fall wegen unberechtigten Gebrauchs von Feuerwaffen. Eine Strafe von vier Jahren Gefängnis. Ein Verstoß gegen die gute Ordnung. Ein wurde freigesprochen.

In einer Sitzung des Militärgerichts am 30. Juni im Strafjustizgebäude Hamburg wurden folgende Fälle verhandelt: 18 Verstoße gegen das Ausgehverbot. Zwei Strafen von drei Tagen Gefängnis, drei Strafen von 14 Tagen Gefängnis, sechs Strafen von 30 Tagen Gefängnis, vier Strafen von sechs Wochen Gefängnis, zwei wurden entlassen, ein wurde in Untersuchungshaft zurückgeschickt.

Bezug von Seife

Für den Bezug von Seife werden folgende Abschnitte der 77. Zuteilungsperiode aufgerufen:

A. Lebensmittelkarten für Normalversorgungsberechtigte:

- Erwachsene über 18 Jahre: der Nummerabschnitt E 25 = ein Stück Einheitsfeinseife
- Kinder und Jugendliche von 6 bis 15 Jahren: der Nummerabschnitt Jgd 50 = ein Stück Einheitsfeinseife
- Kinder bis zu 6 Jahren: der Nummerabschnitt K 38 = ein Stück Einheitsfeinseife.

B. Lebensmittelkarten für Teil selbstversorger:

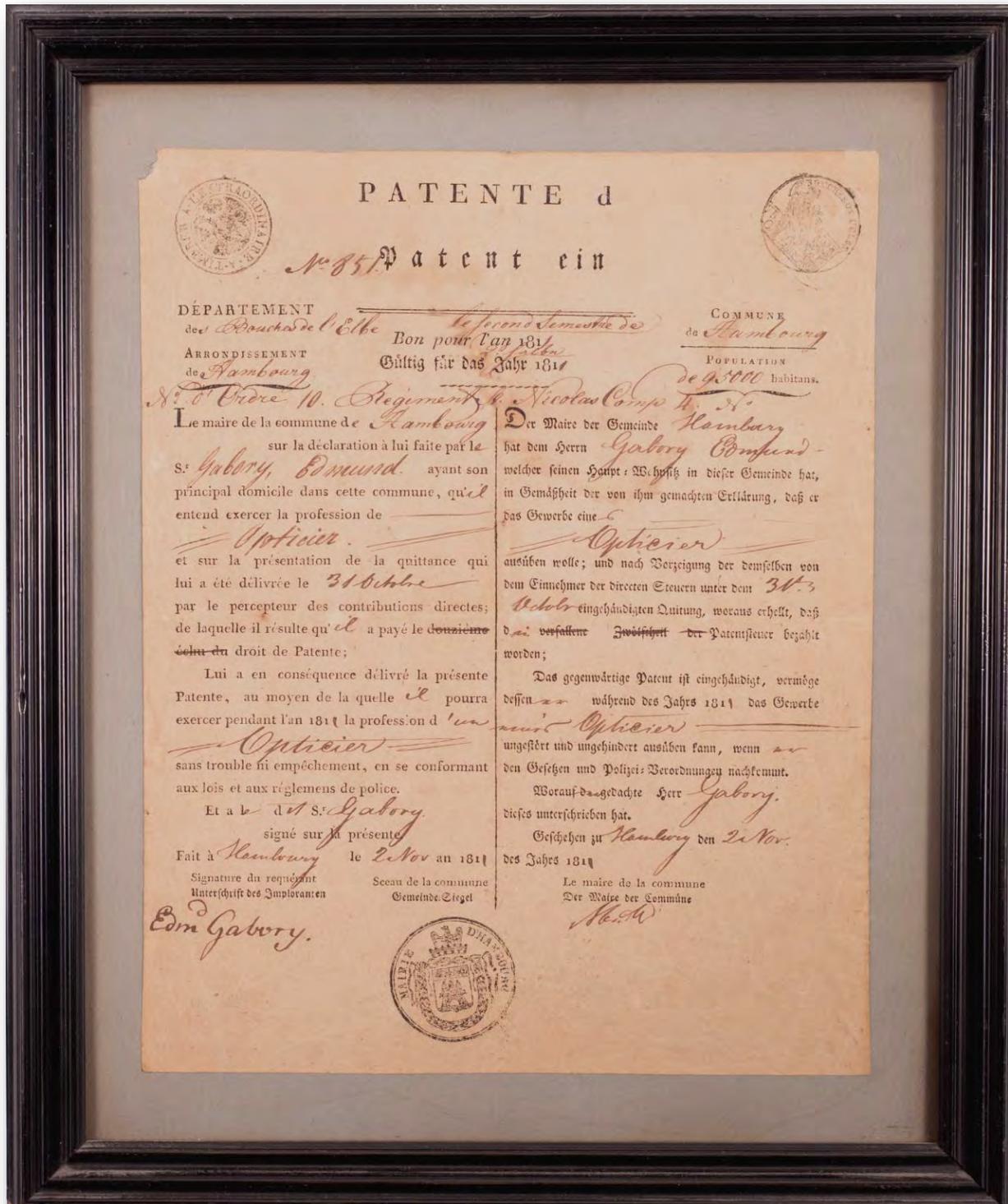
- Erwachsene über 18 Jahre: die Nummerabschnitte E 145 oder E 245 = je ein Stück Einheitsfeinseife
- Kinder und Jugendliche von 6 bis 15 Jahren: die Nummerabschnitte Jgd 150 oder 250 = je ein Stück Einheitsfeinseife
- Kinder bis zu 6 Jahren: die Nummerabschnitte K 138 oder 238 = je ein Stück Einheitsfeinseife.

C. Lebensmittelkarten für Voll selbstversorger:

- über 6 Jahre: der Nummerabschnitt SV 310 = je ein Stück Einheitsfeinseife
- Kinder bis zu 6 Jahren: der Nummerabschnitt SV-K 308 = ein Stück Einheitsfeinseife.

Für die Versorgung von Kleinstkindern (0 bis 3 Jahre) mit Feinseife wird eine besondere grüne Bezugsmarke für „1 Stück Feinseife K1“ ausgegeben. Diese Marke, die von der zuständigen Kartenausgabestelle anzufordern ist, berechtigt nur in Verbindung mit dem für ein Stück Einheitsfeinseife aufgerufenen Abschnitt (K 38, K 138, K 238 oder SV-K 308) zum Bezug von einem Stück Feinseife an Stelle des aufgerufenen Stückes Einheitsfeinseife.

110: Official announcement to the population 1945



111: The Chief Commissioner of the British Occupying Forces was more than amazed to see the original copy of the work permit issued by the French in 1811, 134 years previously, hanging on the wall of the main Krüss office

June 1945 - First steps back into an uncertain future

How were matters to proceed? Was there any future worthy of consideration? In the family chronicle that he compiled in 1966, Dr Paul Krüss makes but brief reference to this period. But the following words are significant:

"The company witnessed both good and hard times, years in which it was difficult to believe in any resurgence of business. But those at the helm never faltered in their conviction and thus derived the strength to forge ahead successfully."

Although business activities continued with a staff of 17 employees, the production of high-quality instruments was terminated. Approval for the manufacture of such equipment, for which, fortunately, the special machines required were still available, had still to be obtained from the military authorities. In June 1945, the company applied to the British Military Government in Hamburg for a production permit. The objective was to once again produce spectral apparatus, colorimeters, photometers, micro-photometers, cathetometers, erythrocytometers, tensiometers and teaching equipment for school use. The Chief Commissioner of the British Occupying Forces in Hamburg showed up in person at the Gertigstraße premises. Seeing the detachment of soldiers stride across the yard, Dr Paul Krüss feared that those machines used for wartime armaments production, common procedure at every company of this kind, would be dismantled and requisitioned.

Remaining relatively unscathed by such demands, the company could attribute its good fortune to the French permit obtained in 1811, the original of which, still in excellent condition, was hung on one of the main office walls. Even in the unsettled Napoleonic period, the company founded by Edmund Gabory had been entitled to conduct its business activities. Dr Paul Krüss deftly drew attention to this fact by quoting: "Everything, after all, has occurred once previously". Ben Akiba, the Jewish scholar and sage from whom this saying originates, was once again proven right: The Chief Commissioner was so impressed by this historical document that he expressed his desire to show it to his superior in England. It was Gabory's apprenticeship in England and marriage to a British citizen that may also have played a key role in this issue. After all, the basis of the discussion was rooted in the British Isles. Reference was made to Jesse Ramsden and England's significant contribution to the field of optics and precision mechanics in those early years. The Chief Commissioner turned out to be quite an expert. The only instrument he subsequently requisitioned was a large Abbe spectroscope.

But he also took the permit along with him. Dr Paul Krüss feared that he had seen the last of this treasured and carefully preserved document. Yet the original was later returned to him in exchange for a copy. And it has remained in family hands until the present day.

The requested permit was slow to arrive, however. Of necessity, therefore, the business was kept running through the production of lowly everyday objects. It was with such insignificant little bits and bobs that many an enterprise began or recommenced its production; cigarette holders, for example – smokes were only available on the black market! – or tiny elephants made of synthetic materials, and other such trifles. The limited number of employees who could still earn their daily bread at the Krüss company enabled their employer to once again weather a period of crisis of his own accord without the need for external support. The strong solidarity and team spirit shown in more favourable times now also came to the fore during a period marked by the struggle for sheer survival.

In his private life, Dr Paul Krüss was dealt a bitter blow on learning that his elder brother Hugo had perished in the final days before Germany's unconditional surrender.



112: *Prof. Dr Dr Hugo Krüss, General Director of the former Prussian State Library in Berlin, born 1879, died 1945 in Berlin*

As the very last of its General Directors, Privy Councillor Krüss was compelled to witness the destruction of his lifetime work at the Prussian State Library in Berlin, Germany's largest, which ceased to exist as an integrated institution. It is to his credit, however, that a vast number of the almost 3.5 million books and documents could be rescued. The evacuation of the library's collections enabled him to display his enormous organisational talent. Some of the books were transferred to Marburg, the others fell into the hands of the Soviet occupation forces and were eventually returned to the re-established State Library in East Berlin.

As he himself admitted, Privy Councillor Krüss was never a "book worm", instead revealing his skills and expertise as an administrator and exceptional organiser of the scientific work to be performed. In masterful manner he had filled the gaps caused by the First World War and the inflationary years. His work was also held in high international esteem. One of the prestigious honours bestowed on him was an honorary doctorate from the University of Oxford. And his ties to the New World were reinforced through particularly special circumstances. He married Anna Bendexta Doty, a young American from Chicago. The great love that united the couple was to last until her death in 1941. Privy Councillor Krüss never recovered from the loss of his beloved wife. And now this extremely lonely man was also obliged to endure the collapse of so much that he had achieved in his professional life.

Although shattered by the death of his eldest brother, Dr Paul Krüss was nevertheless deeply grateful that Fate had spared his family, his work and his home. In 1945, his only son Andres returned to the city of his birth after seven years of military service and captivity.

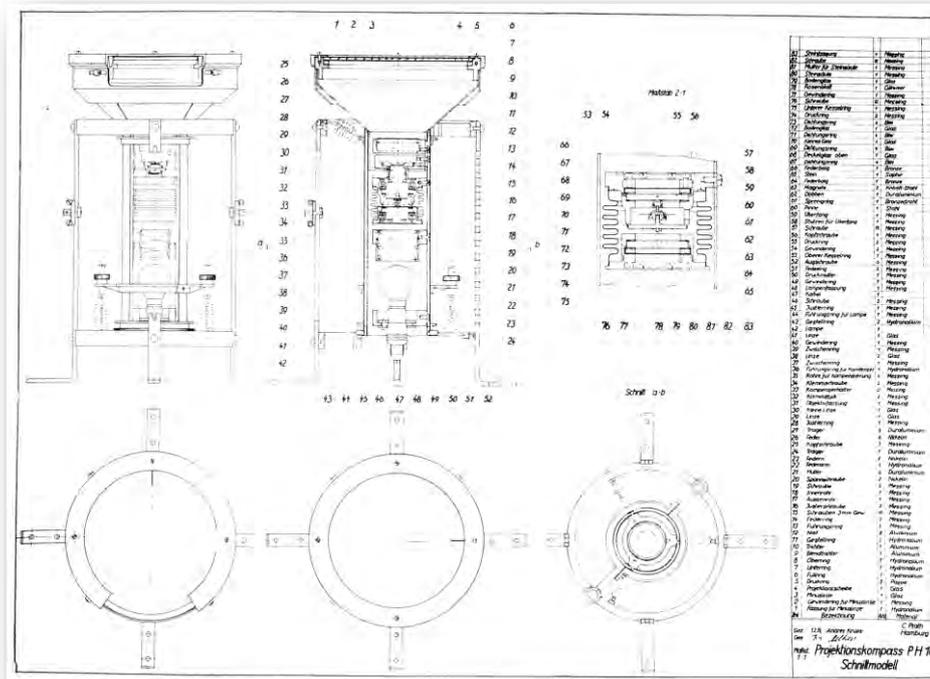
True to the tradition upheld in his family, Andres Krüss had received a sound education and training. After successfully attending the Gelehrtenschule des Johanneums, a classical grammar school in Hamburg, and a boarding school in Solling, the great-great grandson of Andres Krüss, the Heligoland-born forefather whose name he bore, had completed an apprenticeship in precision mechanics at C. Plath, an enterprise specialising in the manufacture of nautical instruments. His journeyman's piece, the section view of a projection compass, was awarded the rating "excellent". Andres Krüss then attended the Gauss School in Berlin, today's Beuth University of Applied Sciences, from which he graduated in 1938 as an Engineer in Precision Mechanics after a 2½-year period of study and training.

He was subsequently conscripted for the then compulsory two-year period of military service. The war against Poland broke out in the following year, a campaign in which he was compelled to participate. For several months he lay in a military hospital in Stettin, was wounded in Russia, again admitted to a military hospital, this time in Vienna, before his discharge from duty and return to Hamburg. During leave granted him for study purposes, he was able to sit and pass the examination required to become a Master Craftsman for Precision Mechanics.

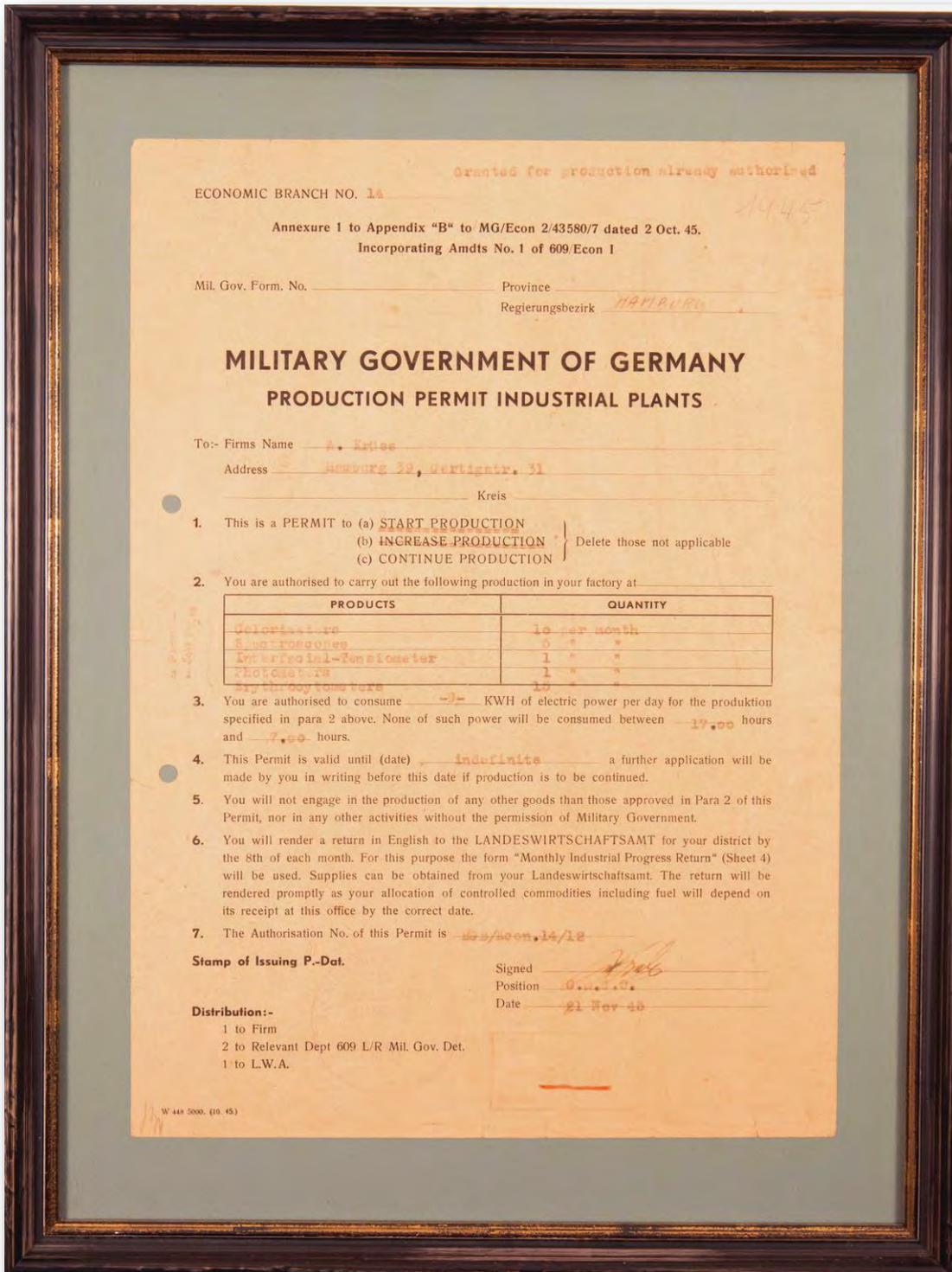
In late 1943, Andres Krüss, now a so-called "Rüstungsurlauber" exempt from military service but assigned for duty in the armaments sector, was dispatched to DVL, the German Experimental Institute for Aviation in Adlershof, a suburb on the outskirts of Berlin. During this period of compulsory duty as an engineer for high-frequency technology at the Institute for Electrical Physics, he also met his future wife. When the institute was re-located to Bad Gastein - Böckstein in the Hohe Tauern mountains of Austria, it was more than clear that the war would soon be over. On the 2nd of November 1945, he received his discharge papers from the competent British military authorities in Hamburg. Six days later, he married Inge Charlotte Martha Bonerewitz, born in 1924 in Königswusterhausen near Berlin. Soon afterwards he joined the family business in a junior capacity: On the 1st of January, Andres Krüss was appointed as a personally liable general partner of the enterprise A. Krüss, Optisch-mechanische Werkstätten. And not very long afterwards he was also appointed to the Board of the Hamburg Society for Precision Mechanics and Optics. In accordance with yet another Krüss tradition.



113: The company at which Andres Krüss undertook an apprenticeship in precision mechanics from 1932-1935



114: Projection compass: Journeyman's piece by Andres Krüss (1935)



115: In July 1945, the company A.KRÜSS finally obtained a production permit from the British Military Government

1946 – The Krüss enterprise obtains the required production permit

In the summer of 1946, the Krüss enterprise at last obtained the permit required for the production of optical and precision instruments. Written in English, the approval granted by the British Military Government encompassed the following products: Colorimeters, spectrosopes, interfacial-tensiometers, photometers, erythrocyometers and cinema equipment. The long-awaited go-ahead was thus given for the production of those instruments that had won the company its exceptional worldwide reputation. The construction of scientific instruments again grew in importance.

Indeed, the old international clients very soon re-established contact with Krüss, well recalling the outstanding precision of German craftsmanship, confirmed especially by this Hamburg-based company. Industrial enterprises and state-owned institutes constituted the two largest customer groups on the domestic and foreign markets.

Despite an initial shortage of material, the following lines taken from an article published in a 1949 issue of the newspaper "Hamburgische Wirtschafts-Correspondent" already reported:

"One micro-photometer was shipped to England, another to the University Observatory in Munich. Since introduction of the Currency Reform, a chemical plant of Farbenwerke Bayer has ordered such an instrument, another is under construction for the Siemens-Reiniger enterprise in Erlangen. Orders are also expected from two plants formerly owned by I. G. Farbenwerke, and also from Australia. In the western zones of Germany, Krüss is most probably the only company at which micro-photometers are currently being produced ..."

This therefore confirms that Krüss, a company that was and would remain anchored to skilled quality craftsmanship, could well hold its own against larger industrial undertakings, even those located abroad. The old core team of specialists more than ably proved its worth. As already the case in the pre-war years, the Workshop Manager and Head of Operations Walter Mahler strongly and convincingly urged for the development and production of interfacial-tensiometers, with the result that this range of instruments soon made a decisive contribution to the overall company turnover. At this point further praise is due to Walter Mahler, over many years a loyal and committed employee who ensured that the apprentices under his supervision, many of whom would later win top awards both on the regional and national level, set off from the workshop on their path through professional life equipped with the highest skills of craftsmanship. In April 1954, an especially meritorious distinction was bestowed on Dr Paul Krüss: He was appointed as an honorary member of the Hamburg Guild of Precision Mechanics. The many tasks, responsibilities and achievements voluntarily accomplished by Paul Krüss over the past half century were also honoured by his fellow members. Confirmation is provided in the guild's newsletter. *"The work he performed so selflessly exerted a profound influence throughout our field of activity"*.

And as expressed by the "Hamburger Anzeiger" in one of its newspaper articles: *"Master craftsmen with an academic degree are by no means rare. Especially in the building trade, many a company owner has been trained to become a qualified engineer. But very few of these specialised craftsmen have succeeded in gaining a doctoral hat in addition to their qualification in craftsmanship. One such specialist is Dr Paul Krüss, a name familiar not only in Hamburg, but also at scientific institutes and universities the whole world over. As a proficient master craftsman, he has forged ahead with further development of the products created by his father, Professor Dr Hugo Krüss"*.

An increasing number of commentaries appeared in the press. On the 1st of December 1954, when Dr Paul Krüss celebrated the 50th anniversary of his entry into the world of business, abundant words of praise were expressed in specialist journals and the Hamburg press.

Here but a few of the press comments published. In the words of "Die Welt", for example:

"After the war, the company quickly began to flourish anew under the leadership of Dr Paul Krüss. Business friends from all around the globe had not forgotten the Hamburg enterprise and once again ordered "made to measure" products that attest to the highest standards of precision craftsmanship. A.KRÜSS is the only company in Germany currently manufacturing micro-photometers. One such device is currently under construction for use at a Mexican observatory. The name A.KRÜSS is universally respected, and, filled with the joy of untiring creativeness, Dr Paul Krüss is doing all in his power to uphold this well-deserved reputation".

This was also confirmed in the "Hamburger Abendblatt", which portrayed the senior director in its oldest column "Menschlich Gesehen" ("Seen Personally"):

"Today the spotlight highlighting all that is of daily interest once again shines on a Hamburg citizen whose name has magnified the reputation of his native city throughout the world of international science. In his white laboratory coat, Dr Paul Krüss very much resembles a medical doctor ... His micro-photometers for use at observatories are instruments of the highest standards with which the luminosity of the stars can be measured and which, endowed with their quality "Made in Hamburg", continue to earn increasing respect within the scientific field. Many of the staff at his Hamburg-based family enterprise have been working there for decades, and their employer takes pride in the long years of devoted service which they have provided. 'They are worth their weight in gold', he says of his team. Despite his 74 years of age, the company head still conducts his professional activities with the same energy as a much younger man".

The official publication of the Hamburg Chamber of Crafts and Trades, the "Handwerksblatt", also extended its best wishes. *"In no small measure, the chronicle of the Krüss family unveils to us the important role which the crafts and trades have played in Hamburg's history. In addition, it teaches us how much can be achieved when skill is united with boldness. We extend our warmest greetings to him (Dr Paul Krüss) and sincerely hope that, at the helm of his company, he will be able to foster and witness its ongoing successful development for many more years to come. His son Andres is already providing him with valuable support in running the business. We also hope that many future generations, too, will continue the work begun by their forefathers."*

One year later, the same hope was expressed in another newspaper: *"It has always been a distinctive feature of Hanseatic entrepreneurship that, over many generations, internationally renowned companies remain in family ownership."*

Born as member of one of the five Krüss generations to date, one man was to live on for posterity in a TV film. "Made in Germany - Ein Leben für Zeiss", a film highlighting the life of the physicist Ernst Abbe, was produced in 1956. Werner Hinz played the part of Carl Zeiss, at the beginning of the film the owner of a small optical workshop. Carl Raddatz took on the role of Ernst Abbe, the professor virtually obsessed with the concept and creation of a precision microscope. Dr Paul Krüss could identify with the film personally. After all, those early years spent in Jena had brought him together with Max Pauly, his future father-in-law, a relationship through which he was made fully aware of the utmost importance this technical development would assume in the optical field. What is more, his father, Professor Dr Hugo Krüss, in the guise of an actor, also made an appearance as chairman of a conference held by the German Society for Precision Mechanics and Optics.

An interesting insight into developments at the company twelve years after the end of World War II is provided in an article written by Professor Dr Geffert, not published in a specialist journal, but in a popular daily newspaper. Here a few extracts from that article.

"We are now on the shop floor in Gertigstraße. Dr Krüss opens a door and before us we see a large grey hollow sphere with a diameter of 1.50 m. Made of sheets of iron which have been welded together, this is a photometer, an instrument used to measure the brightness of light sources. Other smaller photometers, these with a diameter of 40 cm, can also be seen in this area. They are due for shipment to Belgium, where they will be used for the inspection of pit lamps at a coalmine. Next we walk through the packing room. On the crates I can read the names of destinations all over the world.

A particularly large crate filled with spectrometers is to be sent to Caracas; another, this containing colorimeters, will soon depart on the long voyage to Taku in China. In the workroom we are welcomed to the sound of humming lathes, milling machines and drills. This is where the precision mechanics produce the many individual components of the various apparatus; a place, too, in which an observer is given the opportunity of admiring the high-level craftsmanship that arises from the interplay between man and machine.

The instruments are assembled in another room. I examine some of them, attempt to grasp the intricacy of their design and construction, wondering how these tools, conceived by scientific specialists, will be put into practical everyday use.

In addition to the already mentioned photometers, I am also able to view spectral instruments at first hand - spectrosopes, spectrometers, spectrographs -, which serve the purpose of revealing to us the composition of substances on the basis of their spectrum.

My attention is also captured by the colorimeters, with the aid of which it is possible to determine soluble coloured substances; of particular note is the colorimeter designed by Dr Krüss which enables a swift content determination of solutions.

Worthy of closer inspection, too, is the tensiometer, with which the surface tension of liquids can be measured, as well as a high-speed comparator for the evaluation of fine-structure X-ray diagrams ...".

So much for the article by Prof. Geffert, which provides a detailed impression of what at that point was again being manufactured at the Gertigstraße premises.



Besessener Wissenschaftler: Carl Raddatz als Ernst Abbe

„Made in Germany“

Carl Zeiss und Ernst Abbe

„**Made in Germany – Ein Leben für Zeiss**“, dieser deutsche Spielfilm aus dem Jahre 1956 ist am 6. August um 19.30 Uhr im ZDF zu sehen. Im Mittelpunkt des Films steht Carl Raddatz, der den von der Idee des Präzisions-Mikroskops nahezu besessenen Professor Ernst Abbe (1840–1905) darstellt.

Schon als junger Dozent an der Jenaer Universität verband sich Abbe mit Carl Zeiss (Werner Hinz), dem Besitzer einer kleinen optischen Werkstatt. Dieser

förderte seine wissenschaftlichen Arbeiten. Neben Zeiss wurde Dr. Otto Schott (Heinz Engelmann) für ihn ein treuer Freund. Mit beiden gründete er das Glaswerk Schott, um eine bessere Glasqualität für Linsen zu erreichen.

„**Made in Germany**“ erzählt von Abbes harter Arbeit, von Rückschlägen und finanzieller Not, aber auch von glücklichen Zufällen, die den Wissenschaftler auf den richtigen Weg zur Entwicklung „seines“ Mikroskops bringen. □

116: As regards the TV film “Made in Germany”, its Director, Wolfgang Schlerf, would have preferred to set up the Krüss workshop and private office at the former film studio in Bendestorf, a town in Lower Saxony

The year 1958 heralded yet another significant anniversary for Dr Paul Krüss: The Hamburg Society for Precision Mechanics and Optics honoured him for the 50 years of uninterrupted commitment that he had shown as its Senior Chairman. In all likelihood, this is an achievement without parallel: it seems certain that no other chairman of a comparable institution has ever held an office with such great responsibility for such a long period of time.

And here again mention was made of the special feature that characterised this long-established Hamburg enterprise: its unswerving adherence to supreme quality craftsmanship despite a structure not far removed from that at larger, more automated industrial companies. A symbiosis of specialised craftsmanship and industrial production, as emphasised on behalf of Dr Rodenstock, then Chairman of the German Association of the Precision Mechanics and Optics Industry, at the celebratory meeting held at the Hamburg Chamber of Trades on Holstenwall.

"Our industry extends its deep gratitude to you that your objective was not only to highlight and rectify the everyday concerns, but also to take full account of the world of science."

The words of thanks given by the man in whose honour this celebratory occasion had been organised clearly expressed his wish and hope.

"It is my fervent desire that the Hamburg Society for Precision Mechanics and Optics will long remain a forum for the exchange of technological and scientific ideas, a bridge linking industry and craftsmanship, where due credit may be given to human prowess and capability."

And, in words echoing the opinion of all the precision mechanics, a good friend spoke as follows:

"Like a broad arch, the professional life and activity of the man we are honouring today has spanned the vocational development and destiny of several generations of individuals too numerous to list. Dr Krüss has exerted a decisive influence on ensuring an unbroken succession of master craftsmen in the field of precision mechanics. Together with countless others, I too was granted the personal honour of receiving the Meisterbrief, my master's diploma, from his hand. Although Life, outwardly, may not have rewarded him with outstanding possessions, financial wealth or other transitory assets, he is assured of the genuine and lasting friendship of the many who are proud to count him as one of their truest friends."

Despite the sadness that struck in 1956 when his wife passed away, ten days after their golden wedding anniversary, life for this exceptional man remained as busy as ever, and no lonely solitude lay ahead. Customers and business friends continued to call at the company address in Gertigstraße, and the old friendships made over so many long years were fostered when guests arriving at the cosy house in Borstel were shown into the "Jena nook" of his combined study and living room with the colourful pictures of Jena embedded in the panelled wall.

Time and again, the media drew the reader's attention to this company, one of the oldest in Hamburg. Under the heading "Made in Germany", the weekly "Welt am Sonntag" reported as follows:

"To many an international astronomer, the rear courtyard at Gertigstrasse 31 is a more familiar location than Jungfernstieg or Reeperbahn. A company nameplate, truly unassuming in contemporary terms, announces that this is home to the "Optisch-mechanische Werkstätten A.KRÜSS, gegründet 1796", specialists in optics and precision mechanics whose business dates way back to the end of the 18th century. The company produces sophisticated measuring instruments for worldwide observatories and universities: micro-photometers, erythrocytometers, spectrometers and tensiometers. The complicated names given to these instruments mirror the intricacy of their manufacture. The two dozen or so employees are highly-skilled precision mechanics, their superiors physicists and at the same time engineers. Despite his 84 years of age, the current senior head still makes a daily appearance at the company..."

The TV media came to film activities at the company premises, highlighting old documents and apparatus both historic and modern. In its report, the NDR channel described the workshop as follows:

"... there is a conspicuous absence here of any prefabricated parts – each apprentice learns his trade from scratch. In Germany, the company is unrivalled in the manufacture of custom-made products. Each and every tensiometer or spectroscope is an instrument of the highest precision – a masterpiece in fine mechanics! And thus this Hamburg workshop continues to assert the position it has held in the global marketplace for almost two centuries .. "

As the 85-year-old freely admitted: *"I really enjoy my daily work."* For six hours each day he was still in action at his desk or in the testing laboratory. In this way he drew the energy and enthusiasm to compose the KRÜSS Chronicle, a history of the Hamburg-based family enterprise listing the key milestones achieved by the family and company since 1796. It is thanks to his efforts that so much has been recorded that might otherwise have faded into oblivion.

"It is our intention to preserve all this for posterity," he wrote in his foreword.

This chronicle also presents the production programme of the year 1966. Over the decades, particularly in the post-war period, certain product lines were discontinued, others added. The range of spectrometers included hand-held models, spectrometers for experimental purposes, spectrometers as per Kirchhoff-Bunsen, spectrometers with a constant level of dispersion, monochromators, grid spectrometers and spectrometers for jewellers.

The spectrometers on offer comprised a model as per Dr Lang and others for experimental purposes; the colorimeters included a model as per Jules Duboscq, as well as micro-colorimeters. The photometer programme encompassed globe photometers, photometers as per Lummer and Brodhun, as well as Hefner lamps.

Instruments for measuring the surface tension of liquids gained in ever increasing importance, especially the interfacial-tensiometer as per du Noüy and the capillary apparatus as per Dr Kelber. Cathetometers were produced with measuring lengths of 300 und 500 mm. The production of a further appliance, the erythrocytometer, as per Prof. Bock, used to measure the dimension of red blood cells was discontinued, however, due to the development of large-scale electrical devices.

The 7th and 8th Krüss generations take over at the helm

The final lines of the chronicle serve as a written legacy, so to speak.

“Looking back at the reasons why, over so many generations, a family has been able to preserve the old and simultaneously forge ahead into vistas new, we should never forget that the respective company owners have always and unfailingly attempted to emulate the example of their ancestors and, in turn, to set the self-same example for their children as that set by their own fathers before them. This not only as a means of furthering self-interest, but also of contributing to the common good. May their descendants keep this torch alight in all that they undertake.”

Dr Paul Krüss died at 96 years of age on the 12th of March 1976. A gifted and fruitful life was thus extinguished, one in which so many ups and downs had been experienced, one also crowned with the wisdom gained over such a long period of time. Those meeting him in his final years were afforded a glimpse of the inner richness with which Life had rewarded him.

Of the three brothers, he had lived the longest. His younger sibling, Dr Edmund Krüss, Presiding Judge at the District Court and later at the Administrative Court of Hamburg, had also enjoyed a very long life, passing away in 1974 aged 91 years. Paul’s son, Andres Krüss, could not have wished for any better tutor than his own father.

“At the company, I enjoyed the privilege of working hand in hand with my father for over 30 years, in which time I benefitted enormously from the many years of extensive knowledge and expertise that he had acquired.”

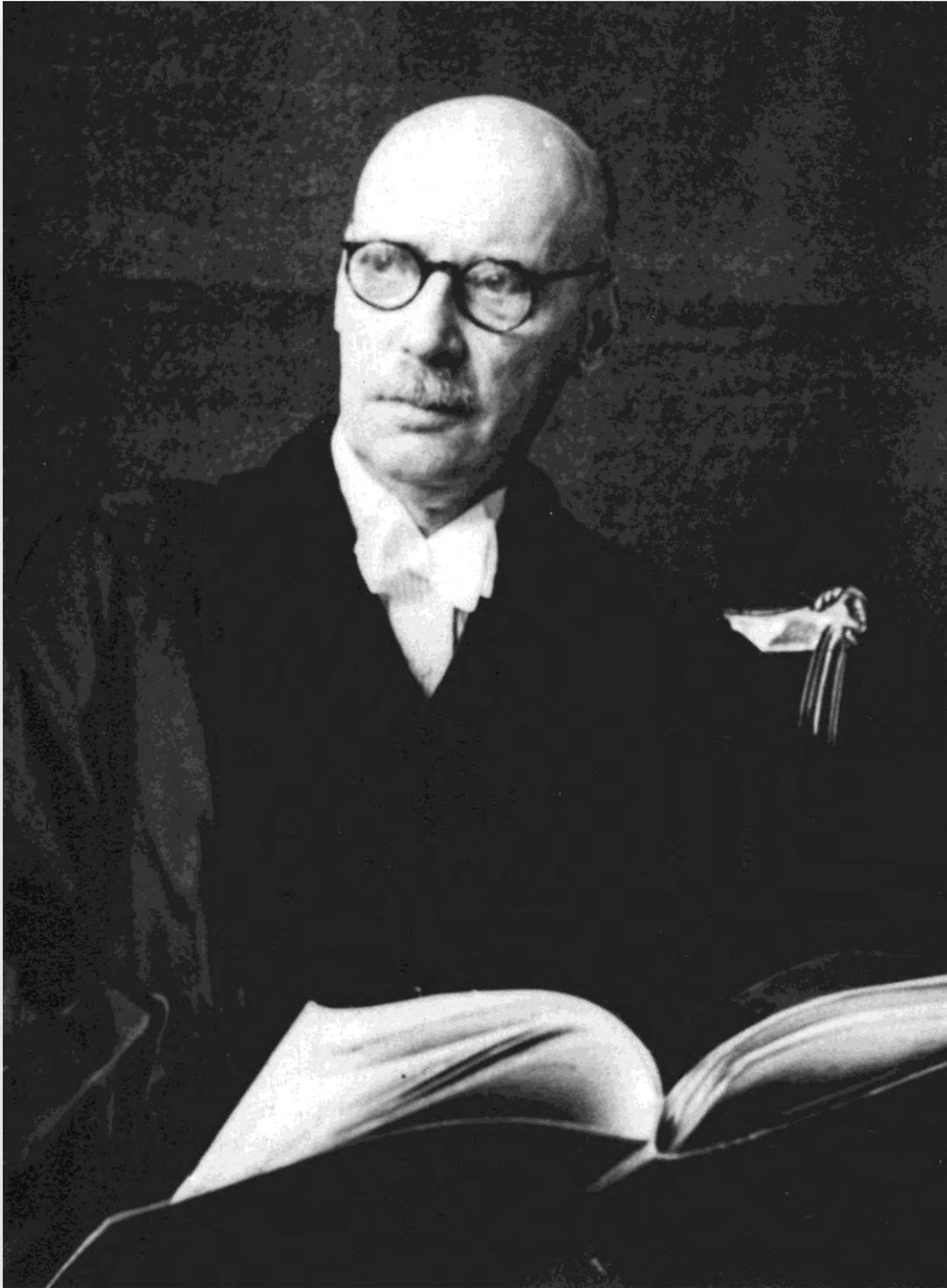
He passed on an enterprise that had borne the family name since 1844, survived the disastrous consequences of two world wars and stepped forward successfully into the new era.

Production processes had to be continually adapted to the new realities. This had never been an easy undertaking, most certainly not in the electronic age during which such breathtaking progress was being made in research and technology. At the Krüss enterprise, too, certain product lines were discontinued, new ones added.

Key attention was now centred on the tensiometers, a range which was constantly being enhanced and driven to new levels of perfection. And the manufacture of gemmological testing and measuring devices marked yet another new and interesting development.

The year 1960 was of particular significance for the development of such equipment. The hand-held Krüss spectrometers then being produced aroused the interest of the mineralogist Rudolf Thurm. In the post war years, Thurm had used English-made gemmological instruments to “spectroscopically” confirm the authenticity of gemstones. Having thus made a name for himself internationally, he was now on the lookout for a German company capable of manufacturing such testing devices. Bearing this in mind, Andres Krüss saw an opportunity both of producing equipment of this type in-house at his own workshop, and of intensifying the collaboration with Thurm. Articles which subsequently appeared in specialised magazines and journals awoke the curiosity of professional circles in the gemmological field. Apparently it would now also be possible to purchase gemmological testing instruments in Germany! Particularly keen interest was shown by the gemmological training institutes in Idar-Oberstein, Königstein and Hanau. In collaboration with these educational institutions, the production range was considerably expanded to incorporate microscopes, refractometers, polarimeters and diamond-testing apparatus.

Andres Krüss also stressed the importance of presenting these devices at trade exhibitions, an advertising medium scarcely used until then. Stands which were set up at the “INHORGENTA” and “BASELER-MUSTERMESE” exhibitions enabled constant product promotion.



*117: Dr jur. Edmund Krüss, Presiding Judge at the District Court and later at the Administrative Court of Hamburg.
Chairman of the Church Council of St Nicolai and Senior Elder, born 1883, died 1974*

The growth in sales revenue made it imperative to enlarge the Krüss team of skilled specialists. Due to the excellent training acquired by its apprentices, however, the company was able to integrate these young professionals into the workforce on conclusion of their training.

Technical obsolescence of the workshop machinery led to bottlenecks in production. In order to rectify this deficiency, it was therefore necessary to gradually replace these aging tools with new and more modern lathes and milling machines. As the equipment required for surface treatment of the instruments was also upgraded, everything apart from the optical devices could still be manufactured in-house at the company premises. Matters took a different turn as regards the efforts made to generate the sales of learning instruments for school use. In this case, collaboration with enterprises specialised in the field was essential. Particular interest was shown by the companies PHYWE and LEYBOLD, both of which expressed their intention to incorporate such instruments in their trade catalogues and also to present them at fairs and exhibitions. Co-operation was also again activated with specialist exporters wishing to re-establish their international connections which had been interrupted during the war. Here too, an extensive foreign-language export catalogue proved enormously beneficial in terms of promotion.

At Krüss, great value was set on personal contact as a means of building relationships with customers both at home and abroad. It was also considered especially effective, whenever possible, to personally assist customers in setting up an instrument and thus provide them with the assurance that they were operating it correctly. This applied to the gemmological instruments in particular. Andres Krüss continued to lead the company until 1980, when he laid its future development into younger hands. It was now the turn of the sixth generation of the Krüss family to take over at the helm. His wife had given birth to two daughters, Martina and Marianne, born in 1946 and 1950 respectively.

And it is at this point that the author of the chronicle before you would like to end his account of the family and company history. Future chapters will most certainly be written by children or grandchildren. Both daughters expressed their interest in taking over management of the company business, but with separate products and sole respective responsibility. Martina, the eldest daughter married to Betriebswirt Dr Clauß Leibrock, a Doctor of Business Administration, agreed to assume overall responsibility, alone and independently, for business operations at the Gertigstraße workshop, now renamed A. KRÜSS GmbH; Marianne, the younger of the two sisters, married to Dipl. Ing. Cornelius Weser, a Graduate Engineer, decided to re-locate the newly established Krüss GmbH to premises in Groß Borstel, with her husband as Managing Director. May both companies continue to co-exist and thrive in a spirit of harmony and understanding.

As did our forefathers, on whose shoulders we strive to uphold the enduring family legacy! Andres Krüss would like to extend his warmest thanks to his team of specialists. Which enterprise can pride itself on the commitment and loyalty of employees such as these, who had served the family business - and no other- for half a century and longer! Walter Mahler, for example, whose achievements as workshop and operations manager have already been highlighted, was thus able to celebrate his 50th anniversary as a company employee, as were the precision mechanics Walter Berg and Horst Reinicke. At that time Arthur Schütt and Hermann Niemeier, also precision mechanics, could look back on 45 years of service to the company, the office clerk Frau Eva Timm to more than 40 years. These staff members formed the backbone of the enterprise.

The coat-of-arms adopted by this family of steadfast Hamburg citizens depicts the two supporting pillars on which the Krüss enterprise has rested ever since its establishment: The owl symbolising Science, the Square and Compasses representing Technology. And the blossoming rose that flanks the crest may also be seen allegorically. As a symbol for hard work and craftsmanship which, constantly adapted to meet changing times and demands, has enjoyed lasting success and continues to inspire an ever growing number of new impulses or ideas and ensure their precise fulfilment.

In 1949, the author and poet James Krüss sent a self-composed poem to my father on receipt of a copy of the brief chronicle written by the latter and published on the 1st of November 1944 to commemorate the centenary of the birth of the company name Krüss. Appropriately, therefore, the final page of the current family and company chronicle shall be graced with these verses.

Dedicated to Dr Paul Krüss in thanks for his friendly letter concerning a "Branch from the same Tree".

*As is foreseeable in the course of Life:
At some point, a certain someone sailed
into the harbour of matrimony.
Children were born,
children grew, grandchildren were born.
What the earliest forefather had begun in distant times,
has grown and endured throughout the decades.
Everyone achieves, everyone strives forward.
Happiness alternates with Misfortune,
the sadness of Death with the joy of Birth.
Siblings set sail for distant destinations,
occasional letters are written from afar.
In places well beyond the homeland horizon,
new family strands are created.
Children are born, children grow,
depart, in turn, for faraway locations.
Further family roots are planted,
the branches grow, extend ever wider
and burst into blossom everywhere.
And, were he still alive, our earliest forefather,
filled with amazement and joy,
could observe the innumerable boughs of the tree he planted
display their green finery in fullest splendour.
Yet the branches themselves, surging upwards,
grow ever further apart.
And only rarely, when one bough
gently dips towards its fellow,
does the flow of sap bring mutual realisation,
that both are of the self-same tree.
And now the whispering begins,
the murmuring and exchange of news,
the revelation quietly reported through the rustling leaves
that siblings have recognised their shared origins.*

Such a bough from the self-same tree,
was revealed, it seems,
when you, whilst reading a newspaper,
discovered a greeting from the old home island
with a mention of the name Krüss!

“Well I never, a signal from someone
nurtured with the same sap as ourselves!”

A cordial letter was written
and copies of stories from the family history
enclosed with those lines.

Astonished and in joyful anticipation,
the recipient of the letter and its content
eagerly read each of the pages,
half wistfully, half hopefully.

“That then, is how things turned out!”
he said to himself smilingly.

“Whilst some of our family remained on the isle,
plying their trade in the field of carpentry,
or casting lobster pots down to the bed of the North Sea,
others ventured forth to Hamburg,
where, through hard work, effort and daring,
they established a workshop,
famed for its exceptional craftsmanship,
thus ensuring that the ancient name
has continued to flourish on the mainland,
has been passed on or intertwined!”

Let us therefore hope
that our name will long live on into the future,
that its esteem will continue to grow
and that an occasional voice will be heard to state:

“Do you see, there, too, walks a Krüss!”

Filled with amazement and joy,
may our earliest forefather (if this were possible!) continue to observe
the innumerable branches of the tree he planted,
display their green finery in fullest splendour!

With kindest regards,

James Krüß

Lechham near Munich, on the 15th of September 1949

MEASURING QUALITY. SINCE 1796

The logo for KRÜSS, featuring the word "KRÜSS" in a bold, white, sans-serif font. The letters are underlined with a thin white line. Above the letters, there is a white arch that spans the width of the text, with a small vertical tick mark at its peak.