

Friedrich Wömpner at Faber Castell

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Introduction

This article is one of a series which details the early slide rules of A.W. Faber-Castell (hereafter referred to as Faber). The series, by Colin Tombeur and myself, is based on our research collaboration and the resulting development and analysis of a database of slide rule specimens, as described in [1].

Our comprehensive summary of the dates of design changes of Faber slide rules in the 1892-1920 period is shown in [2]. An article detailing the changes between 1892 and 1900 appears as [4]. A further article detailing all the subsequent changes up to 1920 risks losing this publication many of its readers so I will restrict myself here to describing a small subset of those changes which appear to me to be of special interest in that they have particular relevance to a certain Faber employee. Further such thematic articles are in preparation.

Friedrich Wömpner was the technical director of Faber Castell's Slide Rule division from 1907 to 1934 [5]. The Faber archives do not reveal whether he joined the company in 1907, or was promoted from within [6] in which case some earlier developments may well have his stamp on them. He retired in 1934, and died in 1952 [7]. Herr Wömpner was a particularly innovative and well-respected engineer. In the period up to 1920, he contributed to two significant patented designs: one for producing slide rules with metal strips embedded lengthways in the stock and the slide, perpendicular to the scales, to prevent warping, and one for making the stock in (or cutting it into) two halves which were joined along the well with a springy material to allow users to control the pressure exerted on the slide. These two features became recognisable on most subsequent models of wooden Faber slide rules, and were awarded German patents. More details on German patent schemes are provided in [1], page 18. Perhaps Wömpner's major claim to fame though revolved around the machinery to carry out the simultaneous marking of scales on slide rules where previously the scales at Faber were marked individually by hand. This particular enterprise did not reach fruition until after 1920 and so falls outside our time period, but deserves a mention here.

The Metal Strips

The metal used here was non-magnetic, very probably brass. The associated patent, DRP 206428, was awarded in 1908: the strips themselves presumably started to appear in 1908 or 1909, and were about 5mm wide and 0.5mm thick. This simple idea to strengthen the wooden rules remained a feature of all but the cheapest and the shortest (12.5cm) wooden Faber side rules. The replacement of wood with plastic as a slide rule construction material at Faber began slowly in the 1930s and was not complete until the 1970s. Contrast this with Dennert and Pape who made a clean break with wood in 1936, making all their slide rules with plastic (ASTRALON) from then onwards under the name ARISTO.

The DRP 206428 statement was shown on slide rules and boxes from about 1908 until about 1930. The appearance of the strips themselves and the DRP number serves as one of the base points in our dating scheme. DRP 206428 was a long-lasting fixture.

The Springy Base

Springy bases appeared on Faber slide rules except the all-wood (no celluloid scales) models initially in about 1908 (dates in italics in this article are taken from our researches: the rest are from other sources), when the flexible material in question was the celluloid strip which covered the floor of the well. This celluloid strip was adapted to its new role by being made thicker and extending further into the wood on either side of the well for added strength. Design Registrations (DRGMs) 296340 and 306107 were awarded for this. In 1911-12, DRGMs 462965 and 522689 were awarded for the replacement of the celluloid with a perforated steel plate which was inset firmly into each side of the well (see Figure 1). The steel had a much more effective springiness than the celluloid. This version, not requiring celluloid for springing, applied to all models.

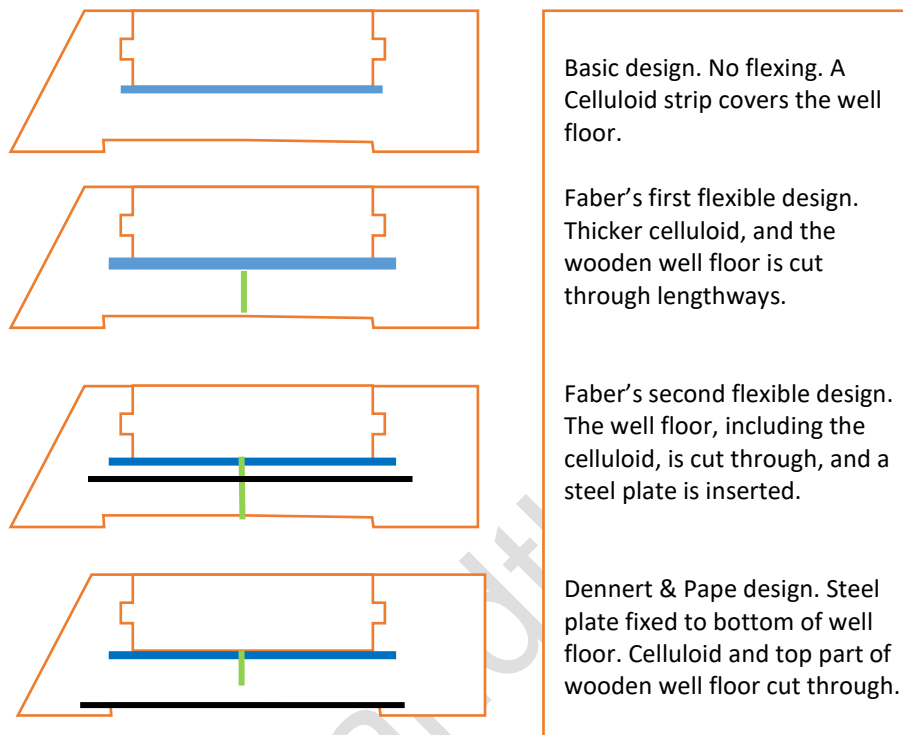


Figure 1: Schematic end views showing springy bases

The springy steel bases actually appeared on Faber slide rules in about 1914. None of the “springy-base” DRGM numbers ever appeared on their slide rules. Faber’s previous attempt at controlling the movement of the slide, the boxwood springs introduced in about 1898 [4] on the more up-market models, finally disappeared with the advent of the springy steel plate.

Dennert and Pape also used the springy-base idea. Their patent (DRP 126499) was awarded in 1901 for a springy celluloid sheet [8, page 22], but this was soon replaced by a solid steel plate fixed to the underside of the well. The wooden section of the well was only partly sawed through from the top, which increased the strength of the joint at the cost of reduced springiness. Later, up-market models were fitted with screws by means of which the grip on the slide could be varied. Other companies adopted similar designs, but it is not for me to judge the merits of the various methods.

The Scale-Cutting Machine

Between 1903 and 1906, Faber followed most other ruler and slide rule makers by replacing slide rule scales that were surface-printed with those that were incised into the surface. Different styles of numbers were used for these incised scales. Wömpner's chief initiative was to continue this development by speeding up the production of slide rules. This was crucial to the ongoing success of the company, although it was not accompanied by a patent. It is commonplace with a patentable idea that the originator may decide not to apply for a patent, because the patent description would inevitably reveal aspects of the idea which the originator wishes to remain secret. That was the case here: Faber obviously decided that secrecy in this field of expertise outweighed any benefits that a patent might provide.

A photograph (Figure 2) shows a version of Wömpner's machine in 1912. The method of "dividing" (cutting) the scales on the machine is briefly described in [8] page 30. The cutting action was provided by a brass block, one version for each model of slide rule, into which was wedged a tiny steel blade for each scale mark. Each brass block would contain the cutting blades for all the scales required on one slide rule, including numbers and letters, and the cutting machine could cut the scales for one slide rule in one quick stamping operation. It could perhaps operate with multiple blocks simultaneously: the exact number is uncertain (other companies, including Dennert and Pape, were producing around 20 slide rules at a time, but each one required the scale marks to be cut one by one on a dividing engine). Faber's progress with this design can be deduced from the brief description given: "This was a rational and highly effective procedure; its development and optimization, however, succeeded only after great difficulties and after considerable expense in fabricating the dividing block. Faber-Castell started the above scale-dividing method for wooden slide rules around 1920, after a long period of testing and experimental series." Faber's difficulties would no doubt have been exacerbated by the effects of World War I (1914-18) which was raging at that time.

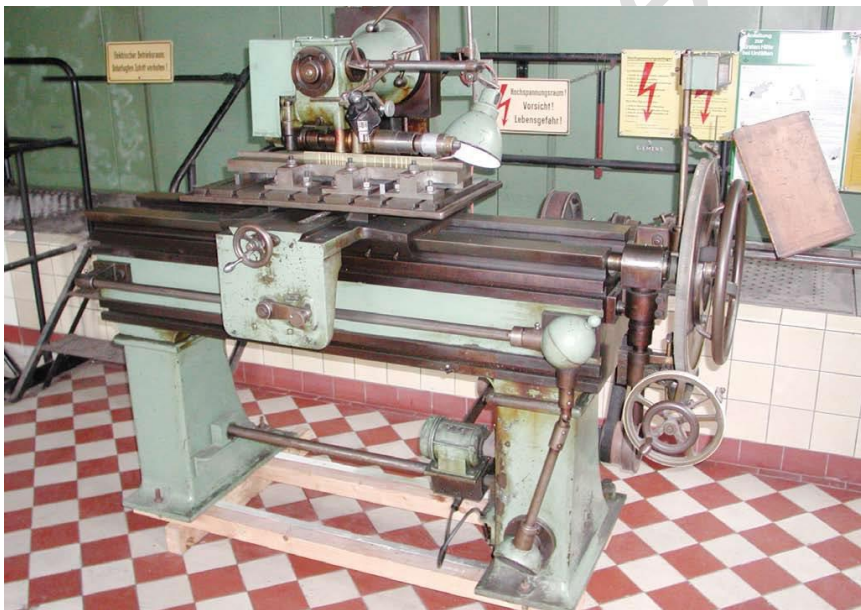


Figure 2: Tool scoring machine after Friedrich Wömpner from 1912 (taken from [5])

From this I deduced that our collection of Faber slide rules from the period up to 1920 would show no signs of this mechanisation. The litany of errors in the scales that I described in [3], including the "glitch" in the number 1 (for 1.1) on the D scale, the untidiness at the end of the tracks, and the stretches where the division lines did not meet accurately with the tracks, persisted right up to 1920, which, I considered, supported my view. On further investigation in my own collection, I noticed that early in 1922 (beginning in 1920, date codes were punched into the slide rules rather than estimated from our database) the D(1.)1 glitch was removed only to be replaced in some cases by a malformed C1 and D2 and other minor irregularities. Could 1922 have been the year that Wömpner's new process started in production?

The new scale-cutting process outlined above clearly includes a manual component in the production of each brass block, therefore it is unlikely that all blocks produced identical slide rules. Evidence is not overwhelming, but manufacturing changes evidently occurred in 1922 which may have heralded the introduction of block printing. Further support comes from Faber's award in 1922 of patent DRP 365637 for "stator parts connected by screws that permit adjustment of the slide action" [8] which might have been implemented at the same time. Perhaps the best piece of supporting evidence I have found (by observation) is that the scale length on the slide rules was decreased from 1922 onwards. The difference is only about 0.5mm, but this is very obvious if a pre-1922 slide is inserted into a post-1921 stock. As a slide rule manufacturer is unlikely to change their scale length except in rare circumstances, this suggests that a new production process started in 1922, agreeing closely with the "around 1920" in [8]. But, based on the evidence of my own collection, the general untidiness remained, persisting until 1937 after which few if any anomalies remained. It would seem that, if my deductions are correct, Faber introduced mechanisation in 1922 to speed up the production process (evidence of which our database does not reveal) and not to perfect the appearance of the slide rules themselves.

Flat Backs

This, the last of my topics, is not one of Wömpner's major successes, but does I think deserve a mention here. The association of flat backs with Wömpner leaves some details to be discovered. The first Faber slide rules had appeared in 1892 with flat backs which displayed inch/cm conversion scales [4]. After about three years the flat backs were replaced with rebated backs, and the rebates contained a paper label showing useful information such as the values of mathematical constants and physical properties of various materials. This rebated appearance continued for the duration of wooden slide rules and many of the all-plastic models.

The above statement is not quite true. The model 361, introduced in 1906 [9] and produced until the 1930s, always had a flat back, completely plain in appearance. A few other similar models were also introduced later [2].

But the 361 was well documented. Not so well documented, in fact not documented at all as far as we can tell, was the fact that in an "interlude" of about one year from about 1906 to 1908, all Faber models with 25cm scales had this smooth, flat back. During our early investigations, one or two "anomalous" flat back models had come to light, with other features such as the two longitudinal slits [4] which dated them clearly to the early 1900s, and which for a while we took to be prototypes. However, as more and more cases came to light, we realised that this was no minor phenomenon. It seemed to affect all slide rules from that brief time period, which appeared to have ended just prior to the introduction of Wömpner's celluloid-sprung models in about 1908. Except for all-wood models, the two longitudinal slits ended at the same time.

This "flat-back interlude" seems therefore to have been experimental at best. We cannot be precise about the timing, but the interlude seems to have started in 1906 or 1907. Interestingly, Dir. Wömpner took up his post at Faber-Castell in 1907, so the question arises: did he instigate the flat-back interlude as one of his first decisions at the company, or did he see that it had already happened, but was not good, and took steps to restore Faber slide rules (with the exception of the 361 and a few other models) to their previous state? I am not able to answer this poser: the complete absence of documented evidence leaves us with no avenues to explore.

One other interesting point does arise however from examination of flat back examples in our database. Three of these are seen to be accompanied in their boxes by two identical strips of card, printed with the information that would have been found on the backs of "normal" slide rules (see Figure 3). One further example has just one such strip, while one more has two different strips. So, out of some eighteen examples in our database from the flat-back interlude, only five are now known to be accompanied by these "info-strips" (4 out of 8 in my own collection, but I now know what to look for). So the second unanswerable question is: did all these flat-back slide rules originally have these strips, most of which have become lost, or did some of them start life with no strips? It is certainly true that the possibility of losses is quite high, even if we accept that slide rules were always precious objects and so would have been looked after carefully. Who knows...?



Figure 3: A flat-back example with info-strips, and a “normal” rule for comparison

References

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- [2] *Overview of A.W. Faber-Castell Slide Rule Dating Chronology 1892-1920* (Colin Tombeur), United Kingdom Slide Rule Circle (UKSRC), Slide Rule Gazette, Issue 17, Autumn 2017, Page 49
- [3] *How did A.W. Faber-Castell Mark their Scales?* (Trevor Catlow), United Kingdom Slide Rule Circle (UKSRC), Slide Rule Gazette, Issue 17, Autumn 2017, page 70
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- [9] *Rechenschieber, Slide Rules A.W. Faber, A.W. Faber-Castell* (Peter Holland), self-publication, seventh revised edition, 2014