A brief survey of combined slide rules

PANAGIOTIS VENETSIANOS

Introduction

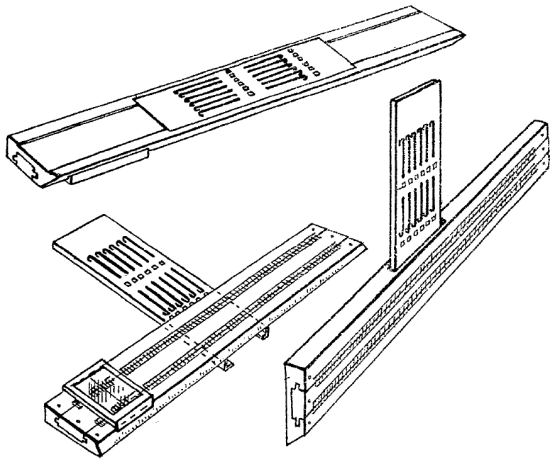
Bizarre, bizarre! Comme c'est étrange![1] This memorable quote of Louis Jouvet in *Drôle de Drame*, a French movie of 1937, came spontaneously to my mind when, browsing the Rechnerlexikon site [2], I stumbled upon a patent for a slide rule combined with a comb. Yes, you read it right, a comb!

This tickled my curiosity and I decided to find out what more objects combined with slide rules inspired the fertile imagination of inventors. I discovered that, besides some quite logical combinations, such as addiators or pens, inventors had also found useful to combine a slide rule with such odd objects as the above-mentioned comb, or such as knives, flash lights and even snuff-boxes!

The present article does not purport to be exhaustive and it does not mention all the patents I was able to find, it is simply a summary of my findings over the Net. Besides, it lists objects known to have been actually combined with slide rules, watches for instance, but also objects for which no actual manufacture could be established, the pen with helical scales, for instance.

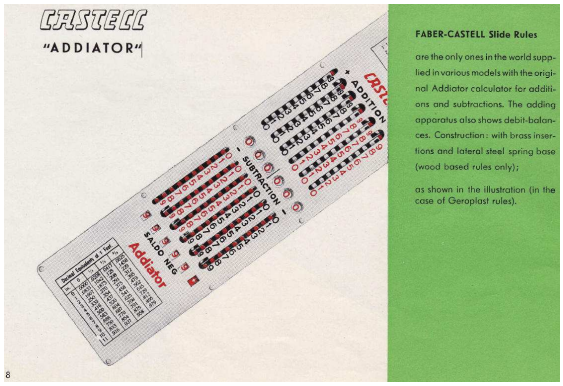
Addiator

Surely one of the more famous and more sought after combination of the modern time, the Addiator slide rule was an invention of Karl Kübler, a German citizen residing in Berlin. Just before the Second World War, he filed a patent application for a «*calculating instrument comprising in combination a calculating slide rule and a narrow flat calculating device for addition and subtraction secured in or to said slide rule*». In Germany it was filed in January 1936 and granted in December 1937, under the number 655353. Kübler filed the application in various other countries in January 1938: the U.S., Switzerland, France, the UK, Austria and, perhaps, other countries as well.
Besides the actually manufactured embodiment of the Addiator at the back of the slide rule, Kübler proposed also another embodiment in which «*the device is arranged in a transverse slot in the rule or in a guide connected to the same*», see the picture below. It is not known whether this sort of shape was ever built.



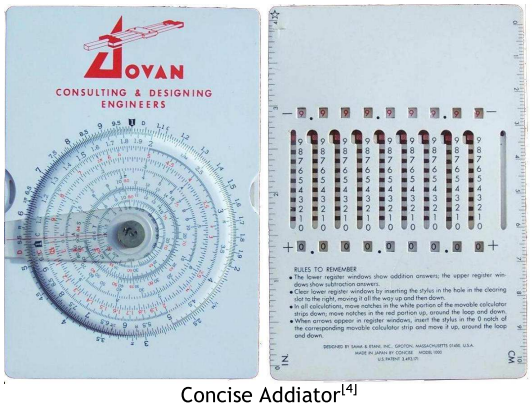
Different embodiments proposed by Kübler

Before World War II, *Faber-Castell* was, according to Dieter von Jezierski[3], the only company to offer this combination of the slide rule and the Addiator adding machine.



As illustrated in the 1966 Faber-Castell catalogue

Other manufacturers are also known to have made Addiators combined with a slide rule, for instance *Alco*, *Concise*, *Kingson*.



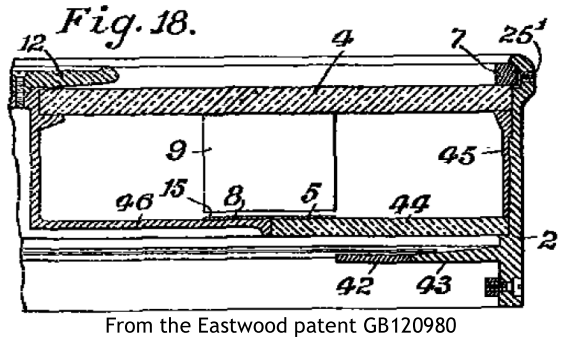
Concise Addiator[4]

[1] Bizarre, bizarre! How strange it is!
[2] http://www.rechnerlexikon.de/artikel/Hauptseite.
[3] Dieter von Jezierski. Slide rules. A journey through three centuries. Astragal Press. Mendham, New Jersey. 2000.
[4] Picture from Tina Cordon's site: http://tinas-sliderules.me.uk

Barometer

In 1919, William Eastwood, from Leeds, received the patent GB120980 for *Improvements in or appertaining to Watches, Aneroid Barometers and other Dial Instruments*. The description of the barometer reads as follows: « *Fig. 18 shows an application of the invention to a barometer, 42 and 43 being the usual barometer scales carried by a revoluble bezel 2, and 44 an annular glass through which the barometrical readings are visible. The glass 44 is retained in position by a ring 45 which also supports the glass 4. The logarithmic scale 5 is carried by the glass 44 and scales 8 and 15 are carried by a disc 46 having a central stem secured to the button 12*».

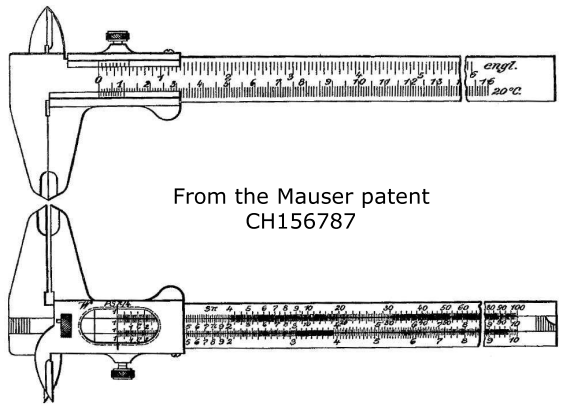
It is not known whether the patent led to an actual manufacture of any of the instruments cited in the patent claims. See also **Pocket watch** and **Pedometer**.



From the Eastwood patent GB120980

Calliper

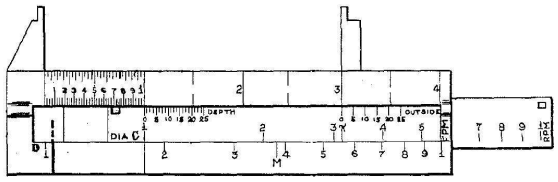
I have found several patents combining a calliper and a slide rule but only one of them can be confused with —and really used as— a conventional calliper, it is the one patented by Mauser-Werke. Other instruments are not truly all-purpose callipers, even if they have vernier devices.


From the Mauser patent CH156787

The German company *Mauser-Werke A.G.*, from Obendorf am Neckar, got the Swiss patent Nr. 156787 in 1932 for a *Caliper usable as a slide rule*. I don't know whether a patent was also applied for it in other countries. There is evidence that this instrument was actually built, the German magazine *Maschinenbau*[5] wrote a report in 1932 praising this combination: «*One of the tools most used by draughtsmen and designers is the indispensable slide rule; on the other hand workshop engineers and plant managers would more easily use a calliper. It was therefore a clever idea to combine both in one instrument and to create the so-called Slide rule-Calliper*». So, bargain hunters be warned and watch out for this rare combination on junk markets or garage sales.

Thomas P. Faulconer, from Rancho Santa Fe in California, obtained the US patent Nr. 2874478 in 1959 for a «*Combination caliper and slide rule*». Its aim was, according to the patent, to provide:

1. a device wherein a caliper measurement of a diameter may be made which results automatically in a setting, whereby the circumference as well as the area corresponding to the diameter measurement may be read directly;
2. a combination caliper and slide rule wherein a caliper measurement may be readily and quickly transferred to a slide rule setting for the purpose of slide rule calculators involving the initial caliper measurement;
3. a combination caliper and slide rule which is particularly adapted to determine the relation between revolutions-per-minute of a rotating member and the surface of such member in feet-per-minute.

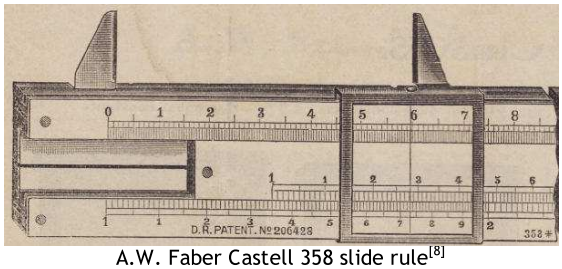

From the Faulconer US patent 2874478

This instrument might have been actually manufactured, the Mid-West Tool Collectors Association (*The Gristmill*) has devoted an article to the Faulconer patent in his No. 85 issue of December 1996 (I have not been able to read it though).

Another calliper slide rule with an unconventional shape is the A.W. Faber Nr. 358, developed by a certain Dr. Hans Lang. The calliper was used to measuring the length of the spindle of an ear of grain. This slide rule was offered from about 1907 through 1930 (for more detailed

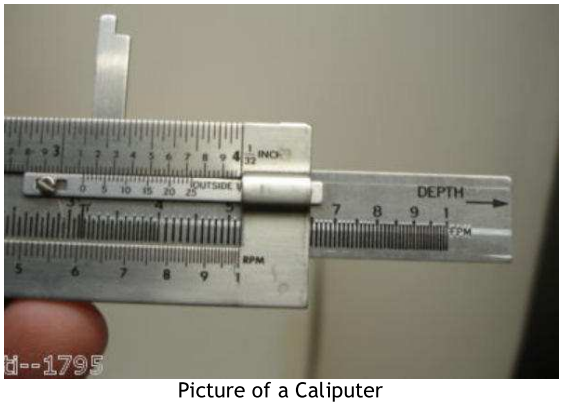
[5] Maschinenbau - Volume 11 – 1932. Page 168.

information, see Dieter von Jezierski's article[6] in JOS 12-2). Karl Kleine says that A.W. Faber applied for the DRGM[7] 262451 for this *Rechenstab mit Schublehre* in 1905 but I have not been able to find a copy of this utility patent.



A.W. Faber Castell 358 slide rule[8]

According to a 1963 advertisement[9] in *The Popular Mechanics*, the «*Caliputer is a combination slide rule, vernier caliper for inside and outside diameters, and depth gauge. Standard model reads to 0.001 in. Mark II HO is calibrated in feet and inches for HO model railroad scale. Made of stainless steel. Costs $9.95*». This instrument could be purchased from *Amtronix, Inc.* Box 44, Chula Vista, California. The picture of this quite rare instrument comes from Rod Lovett's site[10].

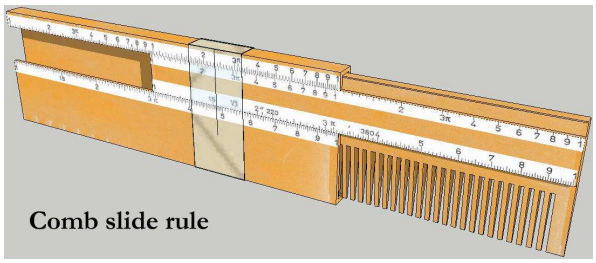


Picture of a Caliputer

Comb

A comb is certainly one of the oddest objects combined with a slide rule. It was imagined by Fernand-Achille Saussol and patented in France in 1934 under the number 771445. According to the patent, the pocket comb consists of a comb (the slide) having logarithmic divisions imprinted on its side, and of a holster (the body of the rule), also imprinted with logarithmic divisions. Even a cursor was foreseen. It is not known whether this slide rule was ever manufactured but, if it was, I guess the slide was always good lubricated and never got stuck.

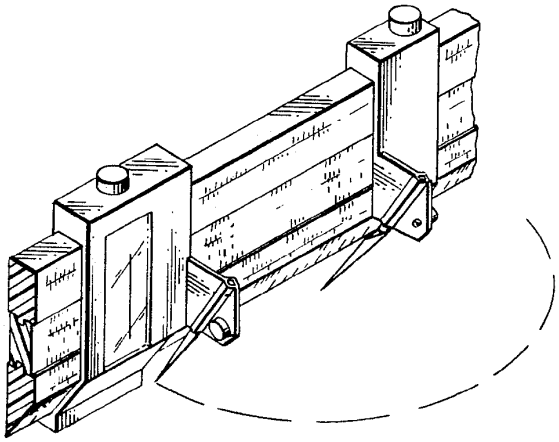
The illustrations —inspired by the drawings from the patent documents— are my own view of how the *instrument* would have looked like.



Compass (dividers)

A certain Edward A. Kuwada, from Los Angeles, California, applied for a US patent for a *Slide Rule and Compass Device* in February 1971 — which was granted in June 1973 under the number 3738009— and an improvement application, filed in November 1971, which was granted in August 1973 under the number 3751813.

The patents deal with a «*combined slide rule and compass device including a slide rule type body and an elongated main slide mounted for longitudinal movement within a guideway in the body, with two external slide elements being disposed about the body and carrying a pair of compass points which are adjustable toward and away from one another for use in drawing or measuring circles*». Was this ever built?



From the US patent 3751813

[6] Lang's Grain Density Caliper-Slide Rule Combination.
[7] *Deutsches Reichs-Gebrauchsmuster*, a German utility patent. Became *Deutsches Bundes-Gebrauchsmuster* DBGM as from 1948.
[8] From an A.W. Faber Castell catalogue found at http://sliderulemuseum.com
[9] Popular Mechanics. September 1963. Vol. 120. NO.3.
[10] http://www.sliderules.lovett.com/

Cufflinks

Slide rule cufflinks are regularly offered on eBay (often together with a slide rule tie-clip). Some are usable slide rules but some others are purely ornamental. An article from 1999 on slide rules —by the Faculty of engineering of the University of Alberta— underlines this fashion aspect: «*No story on slide rules and engineers would be complete without at least some reference to fashion. While style may not have been (or be) the stereotypical hallmark of the engineer, a well-fashioned carrying case accentuated with a set of slide rule cufflinks and completed with a diamond studded slide rule tie-clip certainly marked many a well-dressed member of the engineering establishment*».

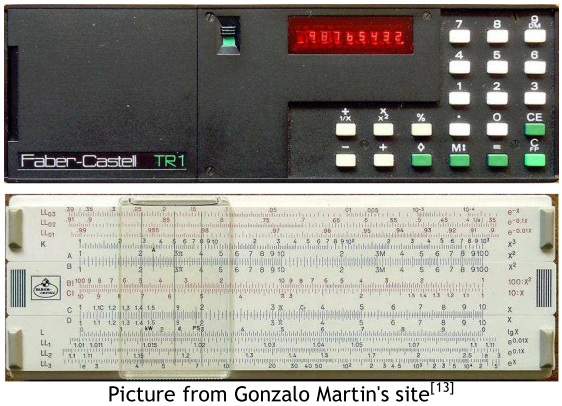
Picture from www.worthpoint.com/worthopedia/

Most of the slide rules are of the straight type but there are also some circular models[11]. *Baby slide rule co*, *Swank*, *Vernon*, are some of the manufacturers. Apparently no patent devoted to this combination has ever been applied for.

Electronic calculator

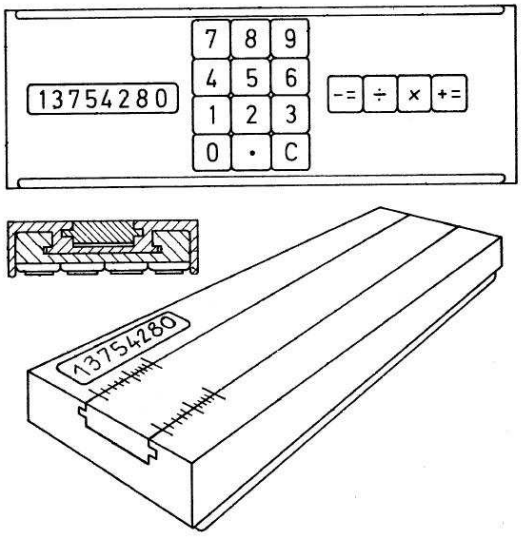
At the end of the slide rule era, some slide rule manufacturers tried to catch up with the speed electronic calculators were gaining the market and began making electronic calculators themselves. Faber-Castell thought it even useful to offer awkward pocket calculators combined with a slide rule. They launched their first models, the TR1, TR2 and TR3, around 1972. Later on they also made a TR4 without built-in slide rule.

The combination slide rule and electronic calculator was not as successful as expected. As put by Dieter von Jezierski[12] in JOS 10-2: «*Their advantage was brief and insufficient. Furthermore, it was impossible for slide rule manufacturers who did not make their own computer chips to keep producing state-of-the-art electronic components and to cope with the rapid fall in price of such components*». The TR series was discontinued around 1977.



Picture from Gonzalo Martin's site[13]

In 1973, Faber-Castell asked a patent for another awkward model wherein both the front and rear side of the slide rule could be provided with visual displays: «*With a computing device of this kind it is possible to change from one kind of computation (i.e. analog using the slide) to another (i.e. digital, using the computer) without obstructing the entire computation procedure and handling of the appropriate computer apparatus. Means is furthermore provided to ensure that the preset values do not alter when changing to different kinds of computation and that moreover the intermediate results are easily visible... ...In order to facilitate the changeover from one kind of computation to another it is appropriate to provide an additional visual display on the front side of the slide rule frame*».



From the Faber-Castell patent 2317928

The German patent Nr 2317928 for this *Slide Rule with Computer* was granted in 1974. It is not known whether Faber-Castell ever actually made it but they certainly believed in its future as they also patented it in France, Italy, Switzerland, the UK and even Japan.

[11] See article by Clay Castleberry in JOS 21-1: *Aviation novelty slide rules*.

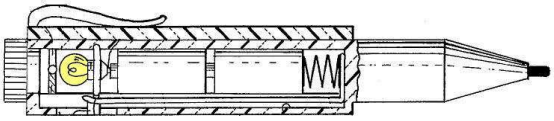
[12] The Faber-Castell Taschenrechner (TR): A Pocket Calculator Combined with a Slide Rule.

[13] www.photocalcul.com

Flashlight

Some inventors had not enough with the combination with only two functions, a certain Michael Vorrasi, from Hollywood, thought it useful to add, not only a slide rule to a pen, but also a flashlight[14]. A clever idea but was this ever built?

See also **Writing instrument**.



Picture from the US patent 4039819
(bulb colored by the author of the present article)

Horizontal instrument

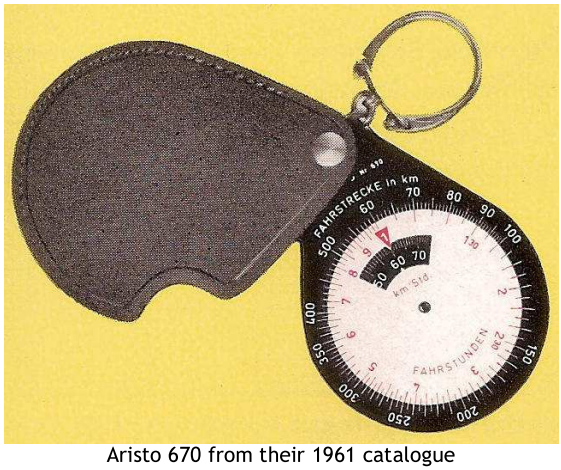
Combining a slide rule, in this case a circular one, with another instrument is almost as old as the invention of the slide rule.

William Oughtred *himself* proposed the combination of two instruments in "*The Circle of Proportion and the Horizontal Instrument*", published in 1632[15]. The picture below comes from the site of the National Museum of Scotland[16]. It shows a circular instrument made by Elias Allen having on one side the «*circles of proportion*» and on the reverse a horizontal instrument which «*demonstrates astronomical principles and was used for laying out sundials* ».

From http://www.nms.ac.uk/

Key-ring

To my knowledge the first slide rules combined with a key-ring resulted from the DBGM[17] Nr. 1642395, granted to Dennert & Pape in 1952. This produced two Aristo models of a motorist slide rule: the 670 with metric units and the 671 with English ones. Their purpose was to compute fuel consumption, duration of the journey and mean speed. Other brands also produced this type of slide rules, some of them being especially intended for aviators.



Aristo 670 from their 1961 catalogue

Knife

A nice and odd object —combining a circular slide rule, not only to a knife, but also to a nail file and even to a lighter — is shown in an article[18] written by Clay Castleberry in JOS 21-1.

Picture from Clay Castleberry's article in JOS 21-1

Lighter

These are quite common and regularly offered on eBay.

Lighter brands known to have offered this combination with a slide rule are: *Corona*, *Chadwick*, *Zenith*, *Zippo*.
See also **Knife** and **Perpetual calendar**.

A Corona lighter [17]

Measuring tape

Slide rules in the form of a flexible tape have inspired a lot of inventors. As put by C.V. Boys in an article[18] on slide rules, in 1885, this is «*Far the most ingenious of all devices for obtaining a great length of radius in a comparatively short*

[14] Michael Vorrasi. US patent 4039819 for a *combined writing instrument and slide rule*. 1977.
[15] This was a translation by William Forster of a manuscript written by Oughtred in Latin.
[16] http://www.nms.ac.uk/support_us/legacies/scientific_instruments.aspx. See also JOS 12-2 for an instrument made by Robert Davenport around 1650.
[17] From Jay Francis' site http://www.slideruleguy.com
[18] Van Nostrand's Engineering Magazine. Volume XXXIII. July-December 1885. D. Van Nostrand, Publisher. New York. 1885.

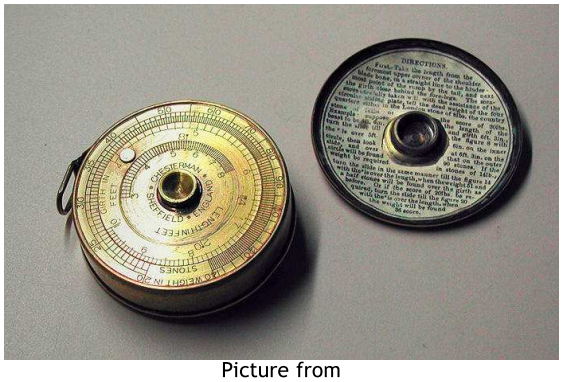
space». Not all of these instruments though combined both functions of measuring and calculating in the same housing. It is to note that Georges Charpentier had also foreseen, in his patent of 1881, the possibility to adapt in the central part of the back of his famous calculimètre several devices such as «*a steel measuring tape, a magnetic compass, a watch marking the seconds, a speedometer, etc.*».

The earlier mention I have found of such a combination is made by J. Bateman in his Excise Officer's manual of 1840: «*An ingenious device, in connexion with the line MD, was adopted some time ago by Mr. Morrison, supervisor of excise. This line, as well as the lines A and B, was graduated in a circle, so as to fit on the top of the box in which the measuring-tape is usually coiled up; and the line B was made to revolve instead of sliding backward and forwards. By this method malt areas could be worked as soon as the dimensions were taken*». Unfortunately the accompanying engraving only shows a circular slide rule and not the overall aspect of the box.

From Bateman's Excise Officer's manual

The second earlier combination is the nice *Chestermann Cattle Gauge* which was introduced around 1842 by James Chesterman of field[19]. According to the *Farmer's Magazine* of August 1845, it was manufactured in Sheffield by J. P. Cutts. The lid contained instructions for using it.

The picture below comes from Nathan Zeldes' site, which contains some more nice close-ups of this instrument.



Picture from
http://www.nzeldes.com/HOC/CattleGauge.htm

One of the more recent such combination is the retractable slide rule developed by *Cal-Tape*, around 1966 (the first advertisement I found dates from that year). It was a 10-inch slide rule and measuring tape. According to a yachting magazine[20] of 1967 «*Skippers who enjoy working time- distance problems, doing really accurate navigating and indulging in other skull-bending enterprises will enjoy the retractable slide-rule put out by Cal-Tape, 1012 Kingston Park, Roann, Indiana 46974*».

Its cost was $8.50. Skid Stick[21] Nr 8 has a small article by Wayne Feely showing the Cal-Tape retractable slide rule which looks as an ordinary measuring tape in a square housing.

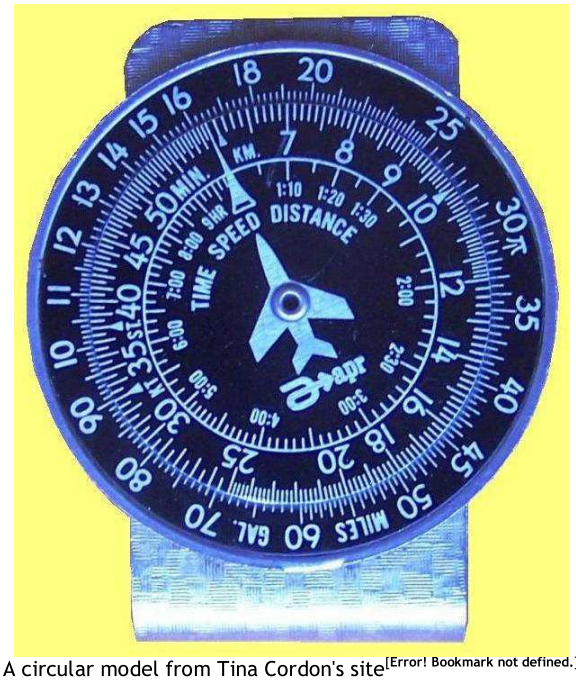
Money-clip

They are not uncommon on the Net. The already mentioned article by Clay Castleberry comprises also a circular slide rule combined with a money-clip and Walter Shawlee's site shows a straight model.

From Walter Shawlee's site[22]

[19] See Conrad Shure. *Cattle Gauge Slide Rules*. JOS 8-2.

[20] The Rudder - Volume 83 - Page 80.
[21] Newsletter of the UK Slide Rule Circle.
[22] http://www.sphere.bc.ca/test/sruniverse.html

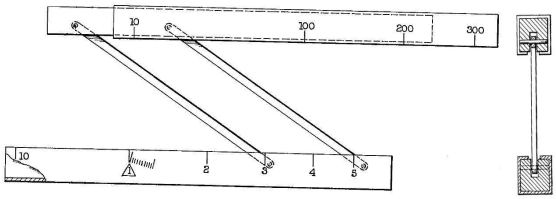


A circular model from Tina Cordon's site[Error! Bookmark not defined.]

Parallel rule

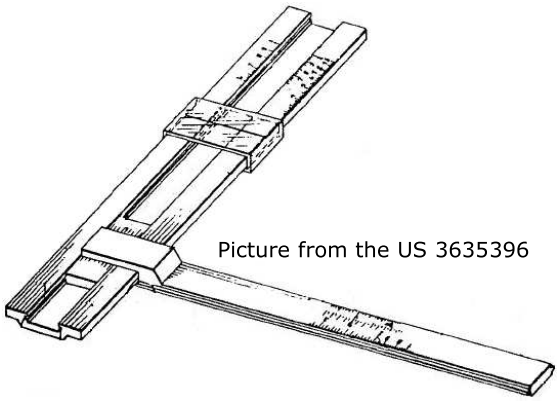
In his application for a US patent, Lyle W. Dixon states that «*there is a long felt and unsatisfied want for a device which combines the features of a parallel rule with those of a slide rule to form a navigator's instrument which is convenient both for making simple calculations and for plotting work. Therefore it is one object of this invention to combine into a single instrument both the features of a parallel rule and those of a slide rule*».

The patent was applied for in 1959 and granted in 1962 under the number 3022002.



Picture from Dixon's patent 3022002

The principal object of Leslie Palfi's invention, an inventor from Toronto, Canada, was «*to provide a parallel rule or sliding T-square which is constructed in such a way that it can be readily reassembled into a more compact configuration in which it is then easily carried, for example, in a pocket*».
Another object of his invention, though being an optional feature was «*to provide a sliding parallel rule which is constructed so that it can also be used as a slide rule for making mathematical calculations*».
Palfi filed his application for a US patent in 1970 and received it under the number 3635396 in 1972.



Picture from the US 3635396

Pedometer

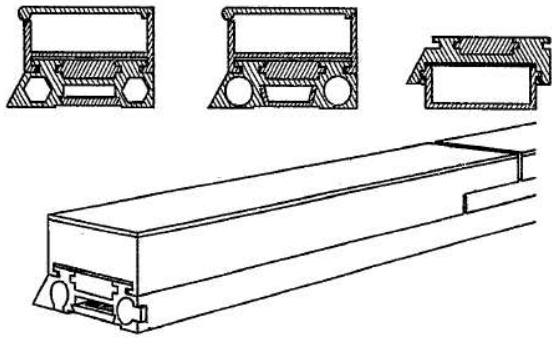
When William Eastwood, from Leeds, filed his patent application in 1917 for *Improvements in or appertaining to Watches, Aneroid Barometers and other Dial Instruments*, he cast quite a wide net for his claims, including even a pedometer: «*My invention consists in applying to a watch or other portable instrument such as a pedometer, volumeter, or aneroid barometer, to form a combined part thereof, parts specially constructed and adapted to form a circular logarithmic slide rule adapted to be used for the general class of calculations for which the usual pocket circular slide rules above mentioned or ordinary pocket rules are employed*». No pictures are shown for this combination in the patent drawings and I tend to believe that this was never built. Eastwood received the patent GB120980 in 1919.

See also **Barometer** and **Pocket watch**.

Pencil box

The inventor of this slide rule combined with a pencil case, a Frenchman called Robert-Pierre Bayard, says in his patent application that «*In order to allow call-out technicians to carry more conveniently some of their equipments and tools necessary to establish a sketch or a drawing, it is desirable to group them in a small box. The aim of the present invention is to gather up, in a compact unit, all the accessories needed for such tasks. The slide rule serves here as a basis, because, either, after being adapted to this purpose, it receives all the elementary drawing tools or, without modifications, it holds a pencil box containing the tools*».

Different shapes were described by R-P Bayard in his French patent, which was granted in 1953, under the number 1040185.

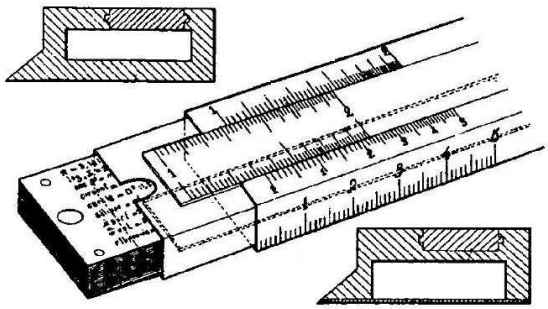


From the French patent drawings 1040185

Note the holes for hexagonal- or round-shaped pencils.

In the same vein, another French inventor, Gustave Riche, imagined in 1904 a holster slide rule[23] «*having the particular feature, compared to the slide rules known to date, that it hosts a void volume that can contain one or several notebooks or other objects*». There are two ways of looking at this: either the slide rule was quite of a large format or the notebooks were rather small.

The French patent Nr 343658 was granted to Gustave Riche the same year when the application was made, in 1904.



From the Gustave Riche's patent Nr 343658

Pencil cup

In the early 1970's, a Danish firm, *Ole Jorgensen Creative Workshop Inc.*, proposed a *Slide Rule – Pencil Cup*, which had one fixed scale on the cup and four moveable rings printed with logarithmic scales. The cardboard box with instructions says that there was an international patent pending by *Copenhagen Creative Workshop Inc.*, but I have not found any evidence of granting.

At least two models are known to have been made, the *Universal Circle Slide Rule* (see picture) and the *Universal Circle Metric Converter*. Several colours have been used for the manufacture.

Ole Jorgensen's Universal Circle Slide Rule

Perpetual calendar

The *Chadwick* company found it useful to combine a slide rule with a lighter and, at the same time, with a perpetual calendar. *Perpetual* meaning in this case from 1950 to 1977. See Clay Castleberry's article in JOS 18-2: *Multitasking Slide Rule for the 1950s*.

The Chadwick 7285 shown on Christian Hamman's site[24]

Pocket watch

This is not to be confused with *pocket-watch type* slide rules[25], like the *Boucher*, which were in the shape of a pocket watch but had not the function of telling the time.

The first pocket watch slide rule was probably invented by Charles Meyrat (a mechanic) and Rodolphe Perdrizet (a civil engineer) and offered for sale in France as soon as 1899. The same inventors had received a French patent in 1880 under the number 139898 for a duration of 15 years for *a kind of circular slide rule or calculating dial*. There are not many slide rules of this type made and I couldn't find any other manufacturer but *Meyrat & Perdrizet*.

[23] *Règle-étui pour le calcul.*

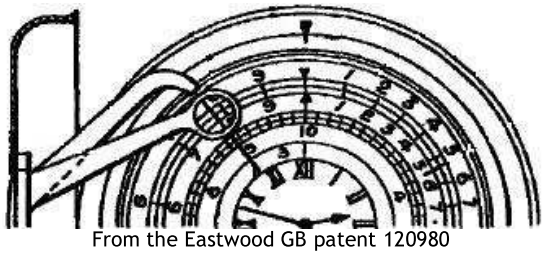
[24] http://public.beuth-hochschule.de/~hamann

[25] Peter Hopp has devoted a whole book on this type of slide rules. *Pocket-Watch Slide Rules. Astragal Press. 2011.*

Meyrat & Perdrizet pocket watch slide rule

The picture above shows a very nice *Meyrat & Perdrizet* which is part of the collection of Sigismond Kmiecik (see photocalcul.com[26]).

In 1919, William Eastwood, from Leeds, received the GB patent 120980 for *Improvements in or appertaining to Watches, Aneroid Barometers and other Dial Instruments*. One of the claims reads: «*In watches of the "hunter[27]" type or in the back of an ordinary watch, the combination with two logarithmic scales and minute scales and parts to form a circular logarithmic slide rule... ...additional circular scales showing the square roots of numbers up to 10 and between 10 to 100 respectively, of which the squares, are ascertained on the inner logarithmic scale by means of a cursor*».



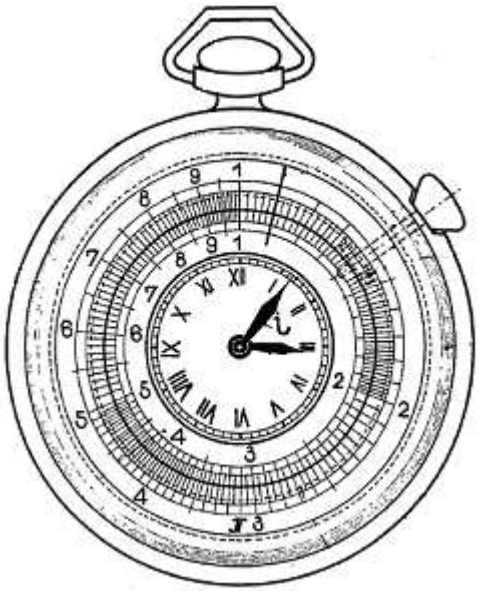
From the Eastwood GB patent 120980

It is not known whether the Eastwood patent led to an actual manufacture of any of the instruments cited in the patent claims. See also **Barometer** and **Pedometer**.

[26] http://www.photocalcul.com/Calcul/Regles/Collection_Etienne_Sigismond/reglesSigismond4.html

[27] Pocket watches with a hinged lid.

One Oiser Szymanski, together with the company *Homis Watch*, received the patent[28] Nr. 189447 in 1937 for a watch/slide rule combination which could be implemented either in a pocket watch or in a wristwatch (the concept of combining a timepiece with a slide rule was extensively used for wristwatches, see further down). I do not know whether this patent lead to an actual manufacture. The overall appearance is quite close to that of a *Meyrat & Perdrizet* model.



From the Szymanski patent CH189447

Snuff-box

Invented by a French mechanic, Louis-Alexandre-Désiré Hoyau[29], the slide rule snuff-box was presented to the *Société d'Encouragement pour l'Industrie Nationale* in August of 1816, which had but good things to say about it: «*These boxes recommend themselves thanks to their perfect graduation which leaves nothing to be desired*».

De Morgan cites the instrument in his article in the Penny Cyclopaedia in 1842: «*12 or 15 years ago an instrument maker at Paris laid down logarithmic scales on the rim of the box and lid of a common circular snuff box: one of two inches diameter would be as good an aid to calculation as the common engineer's rule. But either calcu-*

[28] Oiser Szymanski. Homis Watch. Bienne, Switzerland. Nr.189447. Montre. 1937. See also **Pocket watch**.

[29] Hoyau (domiciled 14 rue Mauconseil, Paris, by the time he made his slide rule snuff-boxes) was a mechanic curious about everything: he is for instance the author of a book on locks «*Art du Serrurier*»; he also got a patent for *mechanical means to sail a ship*; and another patent for a machine for glass manufacturing, etc. He is almost always mentioned as *M. Hoyau*, with no first names.

lators disliked snuff, or snuff-takers calculation, for the scheme was not found to answer, and the apparatus was broken up».

Hoyau apparently didn't apply for a patent.

The nice picture below comes from the exhibition "SIS 25" (held at the Museum of the History of Science, Oxford) which celebrated the 25th anniversary of the Scientific Instrument Society in 2008.

Snuff-box http://www.mhs.ox.ac.uk/sis25/home.php

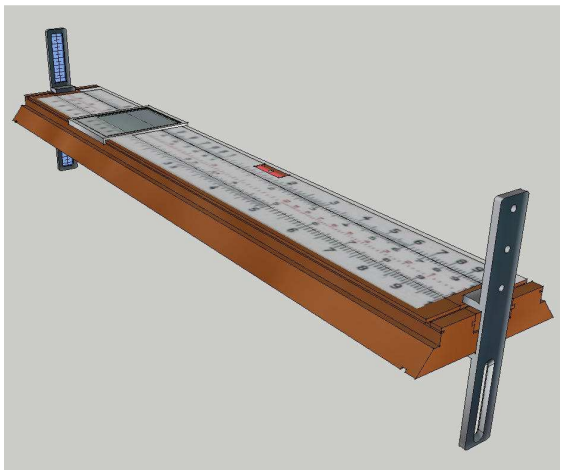
Surveying instruments

The clinometer rule or *règle à éclimètre*, invented by the French colonel Charles-Moyse Goulier, was introduced about 1875 and used for «*any sort of surveying, even in mountainous countries*[30]». The combined instrument is usually composed of an alidade mounted at the end of a slide rule but there are also examples known where the alidade is combined with a straight rule bearing non logarithmic scales. According to a thesis[31] having for subject the cartography in the Northern Alps, the *règle à éclimètre* was one of the first efficient topographic instruments. However, even though Eugène Prévot said it could be used in *mountainous countries*, according to Nicolas Guilhot[31] its alidade was not adapted for long or steep inclinations. This led to the design of a new instrument —the *holometric alidade*— where the sighting device was separated from the rule itself, allowing larger gradients to be measured.

For those interested, a nice and exhaustive article[32] was devoted to the *règle à éclimètre Goulier* in the *Slide Rule Gazette* issue 11 and, furthermore, Gonzalo Martin's site[32] shows quite a few nice pictures.

Picture from Gonzalo Martin's site[Error! Bookmark not defined.]

Another surveying instrument combined with a slide rule was developed by Jordan Socrates Askitopoulos, a Greek citizen, who received for it the GB patent 391617 in 1933: «*This invention has for its object a combined slide rule (of the rectilinear type) and surveying instrument, which, in addition to the usual calculations, provides means for carrying out surveying work, or more particularly, it combines the functions of an ordinary spirit level, an ordinary compass, a hand level, a clinometer, a surveying compass etc. without materially departing from the standard design of slide rules*». Quite an ambitious programme!



The sketch above —which is my own interpretation of the patent drawings— shows how it should have looked like with the *eye sight* and the *reading sight* (respectively right and left) mounted on the rule. I have not pictured the magnetic compass, which was mounted on the back of the rule.

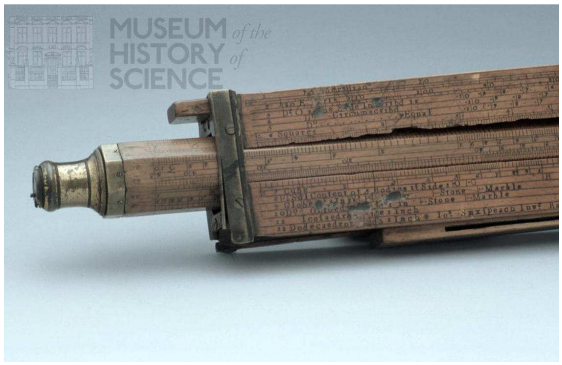
If you own a slide rule with lateral notches near the ends of the rule, and you have always asked yourself what they were for, this might be the answer! More seriously, I do not think it was ever made, except, perhaps, for a prototype.

[30] Eugène Prévot. Topographie. Paris. Dunod. 1898.
[31] Nicolas Guilhot. Histoire d'une parenthèse cartographique. Les Alpes du nord dans la cartographie topographique française aux 19e et 20e siècles. Université Lyon II. 2005.
[32] La Règle à Éclimètre du Colonel du Génie Goulier. An unusual Surveyor's Slide Rule. Rainer Heer, Werner Rudowski. Georges Wagener.

Telescope

John Suxspeach, a schoolmaster in a suburb of London, obtained the UK patent Nr 676 for his *Catholic Organon* in 1753. As put by the author of an article in the magazine of the Macleay museum[33], «*The name of this strange device suggests something to accompany liturgy in a church. Its function, however, was very different. Its full name was the "Catholic Organon or Universal Sliding Foot Rule". It was in fact a slide rule, the first such to be patented*».

The octagonal centre slide of this strange instrument was fitted with a telescope and comprised also two thin slides, each slide containing a brass tongue, that formed a quadrant «*which would be of great use in the practice of arithmetick, geometry, mensuration, gauging, trigonometry, navigation, dialling, astronomy, and all the branches of the mathematicks, being an instrument never discovered or made use of by any other person or persons whatsoever, and would be of great service to many of His Majestie's subjects who were desirous of being improved, constructed, or assisted in the above studies*».



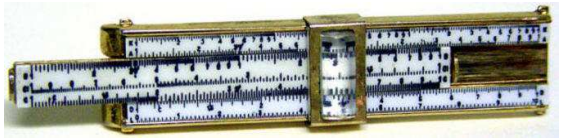
Picture from https://www.mhs.ox.ac.uk

According to the author of the article in the same magazine, the Catholic Organon «*was first produced towards the end of 1752, before the patent was granted, and was still being produced in 1755, but production tailed off after the first year and possibly no more than twenty were produced altogether*». See also various articles from Peter Hopp in JOS 10-2, JOS 12-1 and in the Slide Rule Gazette issue 8.

Tie-clip

According to Dieter von Jezierski, who wrote a nice article on *Slide Rule Tie Bars* in JOS 16-1, «*Neckties in their present long, wedged-shaped form appeared around 1900. After 1920 they became wider and became part of the image of the well-dressed man. Along with the adoption of the contemporary neck-tie, countless versions of the tie bar appeared*». Dieter says that the most important manufacturer of slide rule tie bars was the US firm Swank, Inc. The firm was founded in 1897 but the article gives no date for the first slide rule tie-clip. The ones shown in the JOS are post 1950.

Picture of a Vernon slide rule tie-clip from http://www.rubylane.com/item/480146-O5108/Working-Slide-Rule-Sterling-Tie



Picture of a Swank slide rule tie-clip from http://www.trocadero.com/gideonantiques/items/902869/en2store.html

Tie-clips combined with slide rules were either promotional items[34] or fancy jewellery, there was no really need for them to be functional. Some makers though, for instance Faber Castell and K&E, are known to have offered them with a working slide and cursor which induced some people, and not the least, to actually use them: «*As freshman undergraduates, we knew about some of the famous names on campus, for we had met them at freshman orientation at which we also learned that a B grade would be considered very good because few A grades would be given. Otherwise, they seemed like normal people. After a few years at Caltech, I think that our reverence for their abilities grew with each passing year. I remember Nobel Prize winners Carl Anderson and Linus Pauling very well. Pauling would give every third introductory Chemistry lecture and he would end each class with a calculation for which he would pull off his slide rule tie clasp to calculate the result!* »[35].

I have not found any patent dealing with slide rule tie-clips.

Wristwatch

« *The slide rule wristwatch has a relatively recent origin, arriving in 1940 during the beginnings of World War 2. The beginning of war brought an influx of orders to the Swiss watch manufacturers from all over the world, and with*

[33] Macleay Museum News. Number 18, October 2001. University of Sidney. http://sydney.edu.au/museums/collections/macleay.shtml

[34] See Walter Shawlee's site : http://www.sphere.bc.ca/test/sruniverse.html

[35] See Frank Potter interview (February 2007) on http://www.c4cp.org/FPotter.html

it came the introduction of new watch models with new features. There is some dispute about who manufactured the first slide rule wristwatch, but it was certainly a Swiss firm. The first three slide rule wristwatches came from Breitling, Juvenia and MIMO (Manufacture Internationale de Montres Or). It appears that the extremely rare Mimo-Loga may have been first, with its patent application appearing on July 27, 1940, just weeks before Breitling's patent for the Chronomat was submitted on August 26, 1940[36]*. The Juvenia Arithmo doesn't seem to have become commercially available until later, around 1945*». This text is extracted from a site[37] which I warmly recommend if you love slide rule wristwatches.

For the completeness of the information it ought to be mentioned that at least two pre-war Swiss patents dealt with watch slide rules: one by Oiser Szymanski and another by Walter Moser[38].

Picture from the Grimm patent 680330

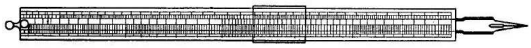
After WWII there were more applications for patents introduced for this combination of a slide rule with a wristwatch. For instance, Edgardo Grimm received —in 1992— the Swiss patent Nr 680330 for his *Fuel consumption calculating slide rule*, which comprised *fixed and rotary rings mounted on watch face with logarithmic scales*. I don't know whether this was ever made.

Below is a picture of a quite recent *Citizen Eco-Drive WR200*.

Writing instrument

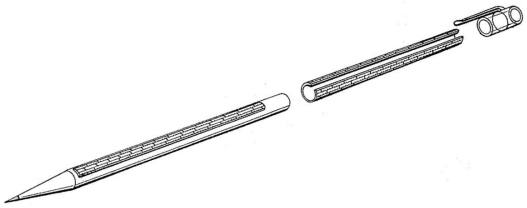
The idea of having a slide rule combined with all kind of writing instruments inspired a lot of inventors. As put by Udo Riehle[39] in his application for a patent: «*The need for a practical combination of a writing implement with a slide rule has been felt for a long time and such implements have already been made in the form of pen and pencil holders, mechanical pencils, fountain pens, ball-point pens and the like*».

They were indeed the object of many patents. One of the earlier I was able to establish was granted in France in 1902 to R. Kron under the number 320058. The drawing from the patent documents shows a slide rule combined, among others, with a *good old* dip pen.


Dip pen from the French patent 320058

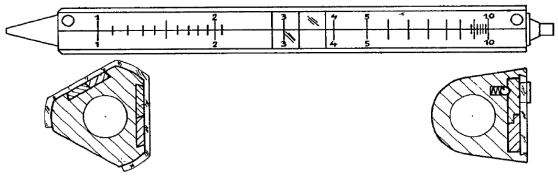
A more recent patent is an improvement to a former one and applied for in the US by Charles H. Schuh. It was granted in 1975 under the number 3892353: «*This invention relates to an improvement in a multi-scale slide rule pen such as is described in my U.S. Pat. No. 3,378,195 issued Apr. 16th 1968, in which, a "Post molded, thermoplastic encased, printed paper laminate," of circular cross section covers the surface of a writing pen, said laminate being in the form of two longitudinal strips, one attached to the pen and a wider one that slides along the pen*».

[36] Nr 216202 for Mimo and Nr 217012 for Breitling.
[37] http://sliderulewatches.yvod.com/.
[38] Walter Fr. Moser, from Bern in Switzerland. Nr. 204559. Uhr. 1939.
[39] Writing Implement with Slide Rule. US patent No. 3261548. Patented July 19, 1966.



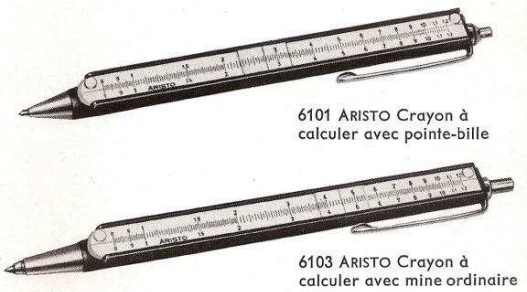
Expanded view from the US patent 3378195

The picture below shows a *Rechenstift* as pictured in the DBGM 1794100, obtained by *Dennert & Pape* in 1959.



Picture from the D&P DBGM patent 1794100

The actual manufacture produced the Aristo models Nr 6101 (a ballpoint pen) and the Nr 6103 (a propelling-pencil).

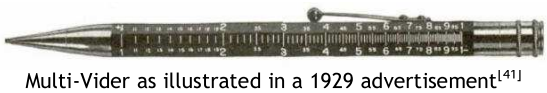


Aristo pen slide rules from their 1961 catalogue

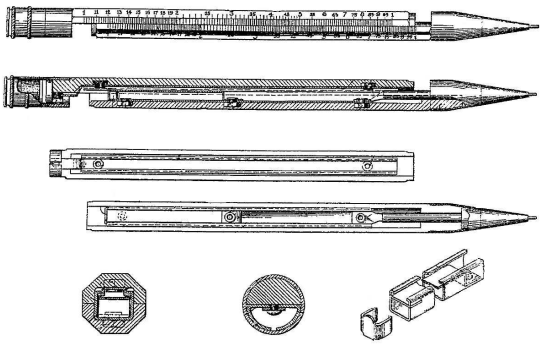
Other brands found over the Net are *Alvin and Company*, *Devco*, *Makeba*, *Monroe*, *Ruxton*, *Voith*[40], etc. They tend to reach quite high prices.

Devco Slide-Pen-Cyl eBay item 3a7d29c0a1

The *Ruxton Multi-Vider Corporation* applied for a US patent for its combined slide rule and writing instrument in 1929. I could not find a copy of it but the French patent is available through Rechnerlexicon. It bears the number 670320 and was granted in 1929.

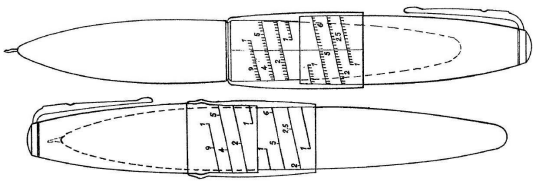


Multi-Vider as illustrated in a 1929 advertisement[41]



Multi-Vider as illustrated in the patent Nr 670320

Not all slide rules combined with a writing instrument were imagined as straight models. A Brazilian inventor, Gilbert Deschatre, imagined a model having helical scales and obtained for his invention the French patent Nr 1154585 in 1957 and the UK patent Nr 811673 in 1959. I don't know whether this was ever manufactured.



Picture from the Deschatre patent 811673

Writing instruments combined with a slide rule are quite rare and very collectible. They certainly deserve a much more detailed article than this one. See also **Flashlight**.

Writing pad / Writing plate

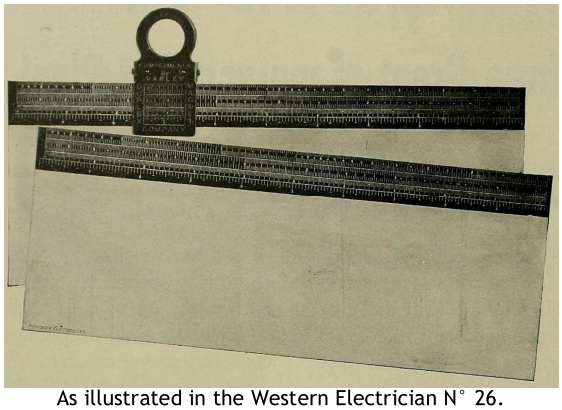
The *Varley Duplex Magnet Company* of Jersey City, N. J. offered in 1899 a quite original Christmas present to its customers. The present in question consisted in a calculating pad and slide-rule combined with which «*All ordinary problems in simple, compound and inverse proportion are readily worked out in one-tenth the time required by the ordinary method of calculation*».

Here is the description given in the magazine Western Electrician[42] «*Each sheet of the pad has along its top edge an accurate impression of the rule, white lines on black background. A small brass clamp enframing a sheet of mica carrying a perpendicular hair line clamps the top of the pad and is made to slide along over the rule. When the top sheet of the pad is filled by memoranda it is torn off, but as each sheet of the pad contains at the top the same representation of the rule proper, it is easy to see how this memorandum pad becomes available as a slide-rule until all the sheets are used*».

[40] See Edwin Chamberlain's article about the Voith slide rule in JOS 6-1.

[41] Popular Mechanics Magazine. Vol. 51. June 1929. N° 6.

[42] Vol. XXVI. January 6, 1900. No. 1. Page 49.



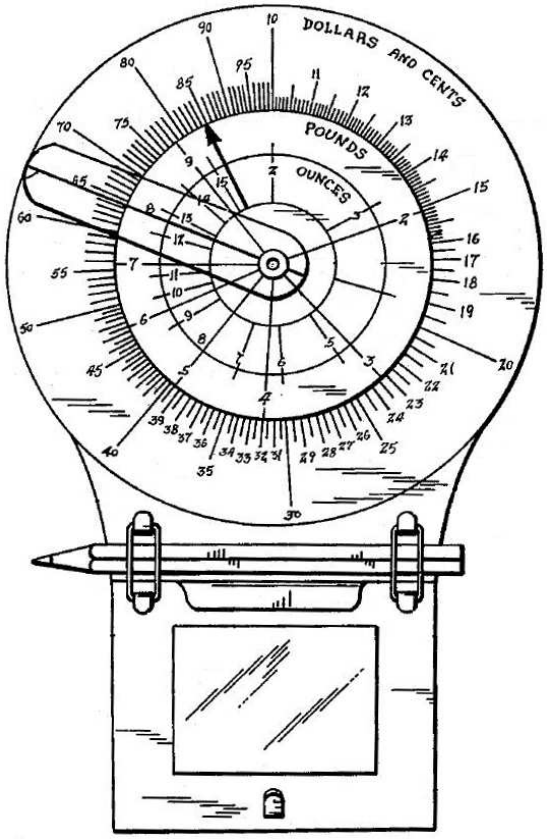
As illustrated in the Western Electrician N° 26.

Apparently the Varley combined slide-rule was very warmly welcomed by its customers as it was still being advertised in the June issue of the Western Electrician as a *New Year's Gift*.

In fact there might have been two versions of this curious pad. The issue 3 of the same magazine states indeed that «*The Varley company is much pleased with the reception by the trade of its novel and valuable Christmas souvenir slide-rule pad. Owing to the desire expressed by many who were favored by the receipt of this useful gift the company contemplates making up another edition of the pads. The new edition will be different from the first in that the rule proper, instead of being a black background with white lines, will be just the reverse, black ruled lines on a white background. It is believed that this change will make the slide-rule divisions more legible*». Our American friends should keep their eyes wide open for this rather unusual slide rule.

In the same vein as the above described device, in 1955, a certain Bernard M. Frank Hollis applied for a US patent for an invention which «*has particularly use as a device to be carried by a shopper, to permit one to easily compute the price of an article, when the total weight in pounds and ounces and the price per pound is known*».

The invention in question consisted in «*a disc-shaped base plate for supporting calculating devices thereupon, a plate member below said base plate and forming an extension thereof, said plate member having a surface for writing thereupon...*». The patent 2871582 was granted in 1959.



From the patent 2871582

General acknowledgements

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February 8, 2013.