ABRAHAM-CHAÏM SAMUEL-HIRSCH SCHABAD.

READY RECKONER.

APPLICATION FILED OCT. 18, 1909.

972,650. Patented Oct. 11, 1910.

Fig. 1.

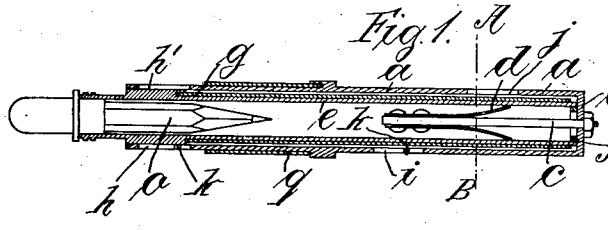


Fig. 2.

Fig. 3.

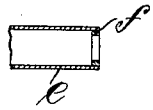


Fig. 4.

	Dolc-Kff.	Kff-Dolc.
100000	422500	23668
200000	845000	47337
300000	1267500	71005
400000	1690000	94674
500000	2112500	118343
600000	2535000	142011
700000	2957500	165680
800000	3380000	189349
900000	3802500	213017

g

Fig. 5.

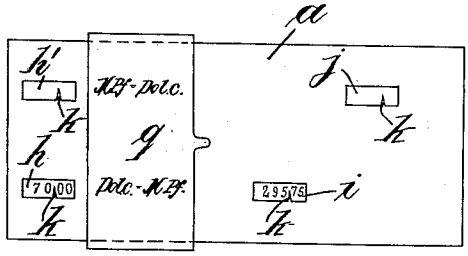


Fig. 6.

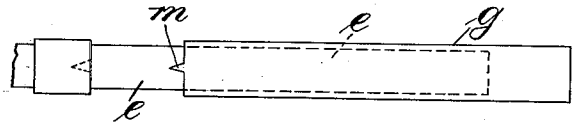


Fig. 7.

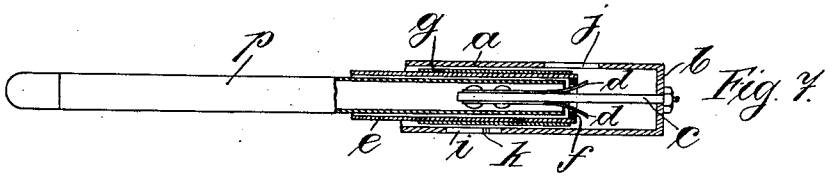
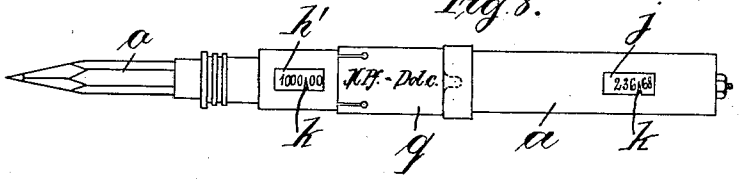


Fig. 8.



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UNITED STATES PATENT OFFICE.

ABRAHAM-CHAÏM SAMUEL-HIRSCH SCHABAD, OF BERLIN, GERMANY.

READY-RECKONER.

972,650. Specification of Letters Patent. Patented Oct. 11, 1910.

Application filed October 18, 1909. Serial No. 523,295.

To all whom it may concern:

Be it known that I, ABRAHAM-CHAÏM SAMUEL-HIRSCH SCHABAD, a subject of the Emperor of Russia, and resident of 22 Klopstockstrasse, Berlin, Germany, have invented certain new and useful Improvements in Ready-Reckoners, of which the following is a specification.

This invention relates to a new and improved ready-reckoner which shall enable the rapid change from one system of coinage into another to be effected or the calculation of the interest accumulated in any given time at desired rates. It may also be used for other purposes for which ready-reckoners in tabular form are provided.

The reckoner herein described is applicable to all decimal systems of reckoning.

By means of the present invention the errors frequently arising from the use of tables are avoided and the position of the decimal point may be very readily determined. Also the apparatus is very compact and may be carried in the waistcoat-pocket.

The invention is illustrated in one convenient form in the accompanying drawings in which—

Figure 1 is a longitudinal section through the apparatus, Fig. 2 a section on the line A—B of Fig. 1. Fig. 3 is a detail view of the end of the inner cylinder. Fig. 4 shows the development of the tables which are carried by the inner rotatable cylinder in Fig. 1. Fig. 5 is a detail view of the slidable cylinder on the outer casing. Fig. 6 is a detail view showing the method of fixing the removable table carrying cylinder to the inner casing of the reckoner. Fig. 7 illustrates the method of removing the inner cylinder from the outer cylinder. Fig. 8 is an outside view of the entire apparatus.

In carrying the invention into effect according to the form shown an outer cylindrical casing *a* is provided having a closed end *b*. To the closed end *b* there is fixed axially a rod *c*. The rod *c* carries two flat springs *d* which open toward the closed end *b*.

Adapted to rotate within the cylindrical casing *a* and also to slide therein, there is a cylindrical casing *e*. The cylindrical casing *e* has at its righthand end in Fig. 1 an inwardly projecting ring or flange *f*. By pushing the cylindrical casing *e* from left to right in Fig. 1 the springs *d* are deflected inward to allow the ring *f* to pass. As soon as the ring *f* passes the ends of the springs *d* these springs come to bear frictionally on the interior of the casing *e*. It will be seen that the casing *e* may be rotated relatively to the casing *a* and also move axially within the outer casing *a*. The springs *d* co-acting with the ring *f* however prevent the casing *e* from being entirely removed from the casing *a*. Over the casing *e* there is passed a cylinder *g* having a table, such as illustrated in Fig. 4, printed thereon. The table illustrated contains in the first column the numbers 1, 2, 3, 4 and so on, each with 5 ciphers. The second column represents the equivalents in converting dollars into marks, that is in passing from the German money system into the United States money system. In the third column there are the necessary figures for converting marks into dollars. In the outer casing *a* there are represented openings *h*, *h'*, *i* and *j*. The openings *h*, *h'* are adapted to come opposite the first column while the opening *i* comes opposite the second column and the opening *j* comes opposite the third column in Fig. 4. In the openings *h*, *i* and *j* a small pointer *k* is provided which shows the position of the point. By pulling the cylinder *e* with the table *g* to the left in Fig. 1, the position of the point *k* is altered as desired. Thus in Fig 5 the decimal point *k* is indicated as representing 70.00 dollars and in the opening *i* there is seen the number: 295.75 marks (on the basis \$100=422.50). The comma-projections *k* are in the form illustrated fixed to the casing *c*. The opening *h'* and the opening *j* are arranged in line and enable the transference from marks to dollars to be effected. The cylinder *g* is merely pushed over the cylinder *e* and is provided at its lefthand end, see Fig. 6, with a projecting lug *m* which is adapted to enter a corresponding notch *n* in the shoulder of the casing *e*. A pencil *o* may be inserted in the open lefthand end of the casing *e* as seen in Fig. 1.

It will be understood that by replacing the cylinder *g* with any other tables any desired kind of calculation may be effected with the ready-reckoner herein described. To enable the casing *e* to be extracted for such removal and change of the cylinder *g*, there is provided a tube *p* which is adapted to pass easily through the casing *e* and compress the springs *d* so that the free ends of the springs come clear of the ring *f*. This is

easily effected because the diameter of the tube *p* is smaller than the diameter of the tube *e* against which the springs *d* rest, therefore the tube *p* may press the springs together when passing over same whereby the ring *f* may pass over the springs and the tube *e* may be taken out. The casing *e* may then be extracted and the cylinder *g* changed as desired. An outer short cylinder *q* is also preferably passed over and fixed to rotate with the outer casing *a* and this cylinder carries the inscription of the kind of reckoning being made. Thus in the form illustrated the cylinder *q* carries the inscription "Dollars", "Marks", where it comes opposite the openings *h* and *i* and "Marks", "Dollars" in the line of the openings *h'* and *j*.

It will be understood that when any desired number of one system is required to be changed into another monetary system that the change must be effected in stages, thus if it were desired to convert 728 marks into dollars and cents the operator will first find the equivalent of 700 marks, then of 20 marks, then of 8 marks, write these equivalents in a row and add them up. To facilitate the writing down and adding of these numbers the pencil *o* is provided.

I claim:

1. In an instrument of the kind described an outer cylindrical casing having a plurality of openings therein, an inner casing rotatable within said outer casing and relatively slidable thereto, said inner casing being provided with rows of figures adapted to be brought in succession under the openings in said outer casing, and a spring fixed to said outer casing and engaging frictionally within said inner casing.

2. In an instrument of the kind described an outer cylindrical casing having a plurality of openings therein, an inner casing rotatable within said outer casing and relatively slidable thereto, said inner casing being provided with rows of figures adapted to be brought in succession under the openings in said outer casing, a flange on the end of said inner casing and projecting inwardly thereof, and a V-shaped spring fixed to said outer casing and frictionally engaging the walls of said inner casing, substantially as described.

3. In an instrument of the kind described an outer cylindrical casing having a plurality of openings therein, an inner casing rotatable within said outer casing and relatively slidable thereto, said inner casing being provided with rows of figures adapted to be brought in succession under the openings in said outer casing, a flange on the end of said inner casing and projecting inwardly thereof, a V-shaped spring fixed to said outer casing and frictionally engaging the walls of said inner casing, and means for compressing the V-shaped spring to effect the removal of the inner casing as desired, substantially as and for the purpose as described.

4. In an instrument of the kind described an outer cylindrical casing having a plurality of openings therein, an inner casing rotatable within said outer casing and relatively slidable thereto, a cylinder pushed over said inner casing and having rows of figures thereon on its outer surface, said figures being adapted to be brought in succession under the openings in said outer casing, means for preventing relative rotation of said inner casing and said cylinder carrying the figures, a flange on the end of said inner casing and projecting inwardly thereof, a V-shaped spring fixed to said outer casing and frictionally engaging the walls of said inner casing and means for compressing the V-shaped spring to effect the removal of the inner casing as desired.

5. In an instrument of the kind described an outer cylindrical casing having a plurality of openings therein, an inner casing rotatable within said outer casing and relatively slidable thereto, said inner casing being provided with rows of figures adapted to be brought in succession under the openings of said outer casing, a spring operated friction device carried by one of said casings and frictionally engaging the other and an outer tube over said outer casing, said outer tube being provided with suitable inscriptions opposite the openings in the outer casing and means for fixing said outer tube to prevent relative rotation between said outer tube and the outer casing.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

ABRAHAM-CHAÏM SAMUEL-HIRSCH SCHABAD.

Witnesses:

WOLDEMAR HAUPT,

HENRY HASPER.