F. TRINKS.

CALCULATING MACHINE.

APPLICATION FILED JAN. 30, 1914.

1,100,631.

Patented June 16, 1914.

2 SHEETS—SHEET 1.

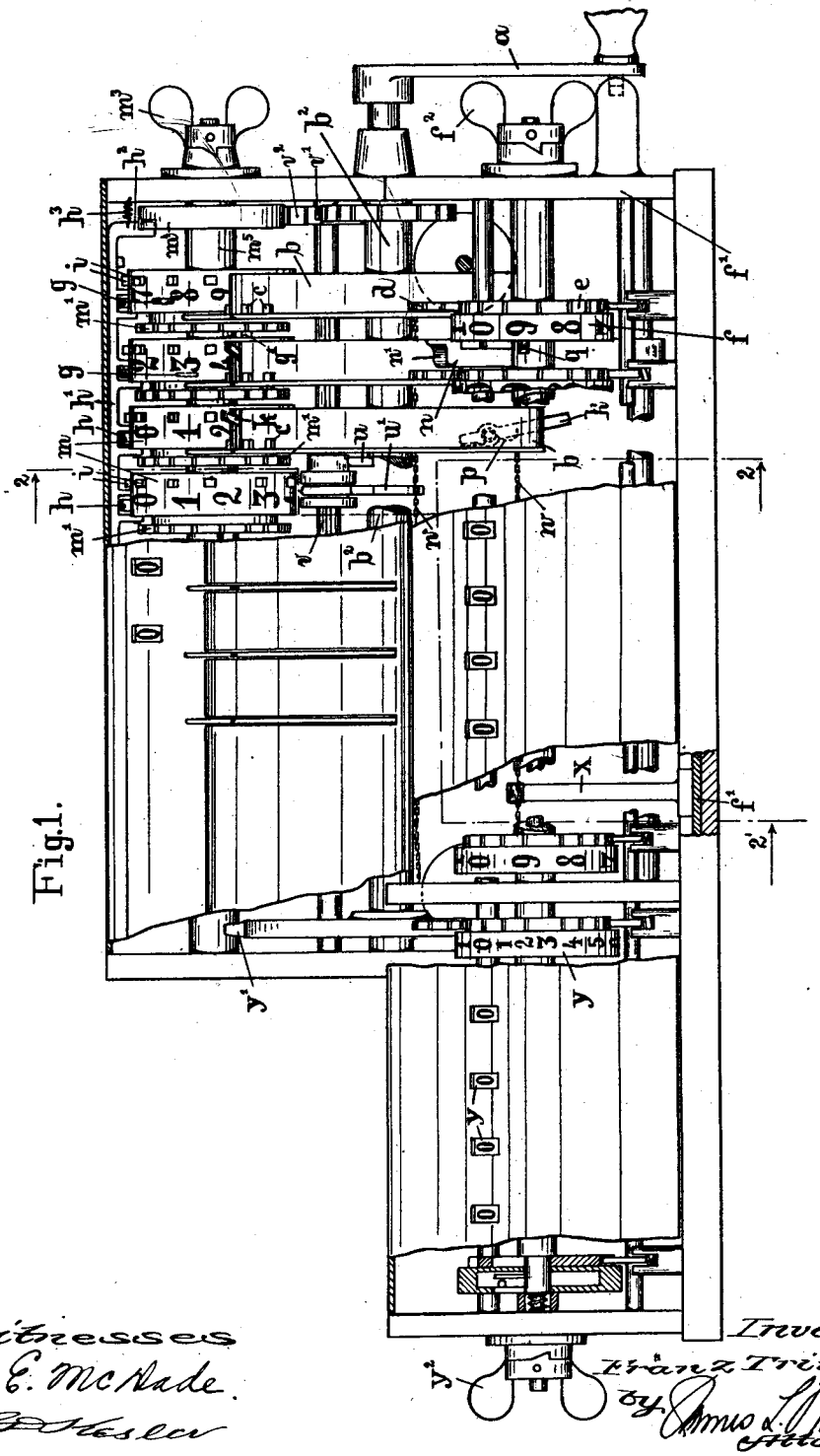


Fig. 1.

Witnesses
M. E. McKade.

Inventor
Franz Trinks
by James L. Norris
Attorney

F. TRINKS.

CALCULATING MACHINE.

APPLICATION FILED JAN. 30, 1914.

1,100,631.

Patented June 16, 1914.

2 SHEETS—SHEET 2.

Fig. 2.

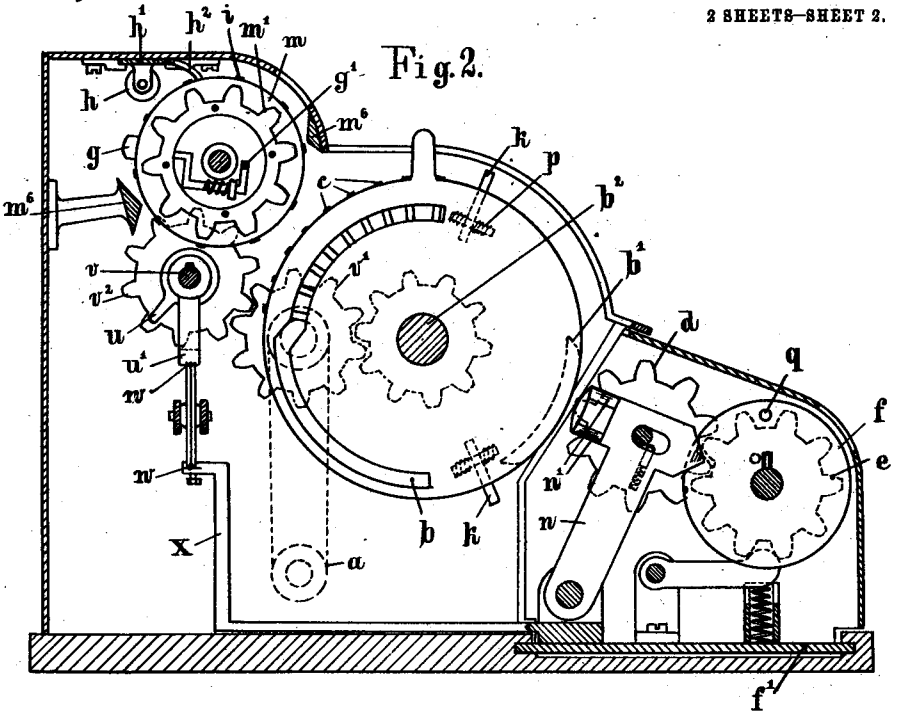


Fig. 4.

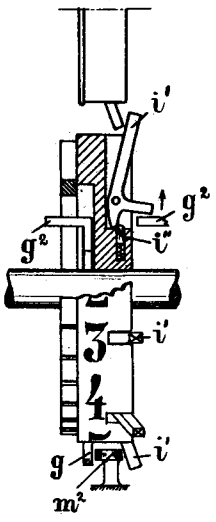


Fig. 3.

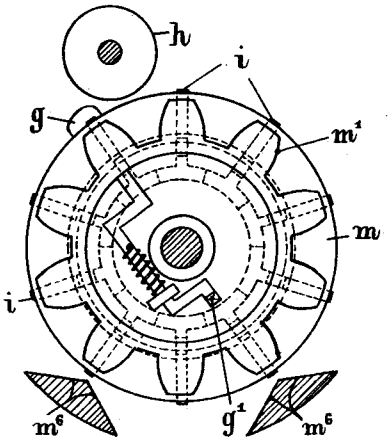
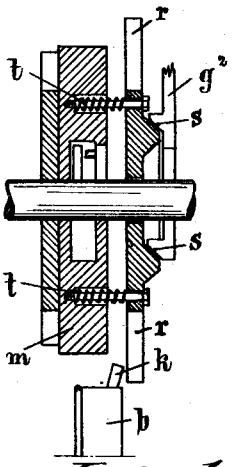


Fig. 5.



Witnesses:

M. E. McDade

Inventor

Franz Trinks

by James L. Norris

Attorney

UNITED STATES PATENT OFFICE.

FRANZ TRINKS, OF BRUNSWICK, GERMANY.

CALCULATING-MACHINE.

1,100,631. Specification of Letters Patent. Patented June 16, 1914.

Application filed January 30, 1914. Serial No. 815,500.

To all whom it may concern:

Be it known that I, FRANZ TRINKS, manufacturer, citizen of the Duchy of Brunswick, Empire of Germany, residing at Brunswick, Germany, have invented certain new and useful Improvements in Calculating-Machines, of which the following is a specification.

My invention relates to improvements in calculating machines, and more particularly in calculating machines in which setting disks are provided which carry radially shiftable teeth representing the values to be transmitted by the operation of the setting disks to the numeral wheels of a registering mechanism, and in which the carrying mechanism consists of rocking levers in the form of hammers and adapted to shift teeth provided on the setting disks into operative positions in which the numeral wheels of the higher order are advanced a distance corresponding to one value if the numeral wheel of the lower order passes from the "nine" position to the "zero" position, or vice versa. Carrying mechanisms of this class are shown for example in the patent of the United States No. 1,040,059 granted to me October 1, 1912. In machines of this class additional registering mechanisms have been provided which are used in certain calculations, and which are likewise provided with carrying mechanism of their own. Machines of this class are shown for example in the patent of the United States No. 1,007,618. As shown in the said patent the carrying mechanism for the additional registering mechanism consists of radially shiftable or laterally rockable single teeth or of a gear wheel provided one for each of the numeral wheels of the additional registering mechanism.

The object of the improvements is to provide a machine of this class in which the carrying mechanisms are made more simple in construction.

With this object in view my invention consists in so constructing the carrying mechanisms of both registering mechanisms, that the rocking teeth provided on the setting disks are adapted to operate the carrying mechanisms of both registering mechanisms. It will therefore be understood, that instead of two operating means for the carrying mechanisms a single one is provided which is common to both carrying mechanisms. In my improved construction the teeth of both carrying mechanisms are located or operated in two different planes, so that the radially shiftable teeth provided on the setting disks for transmitting the values set on the setting disks to the numeral wheels do not interfere with the carrying mechanism of the additional registering mechanism.

For the purpose of explaining the invention several examples embodying the same have been shown in the accompanying drawing, in which the same letters of reference have been used in all views to indicate corresponding parts.

In said drawing—Figure 1 is a front view of the calculating machine with the cover of the casing removed, and several of the setting disks and numeral wheels removed, Fig. 2, is a cross-section taken on the line 2—2 of Fig. 1, Fig. 3, is an enlarged detail view showing a numeral wheel, Fig. 4, is a detail view partly in section showing a modification of the invention, and Fig. 5, is a partial plan view partly in section showing a further modification of the invention.

Referring to the example illustrated in Figs. 1 to 3, the setting mechanism comprises a plurality of setting disks b which are equipped with radially shiftable teeth c, and which are adapted to be rotated by means of a crank a. The teeth of the setting disks are in positions for meshing with the teeth of intermediate gear wheels d which engage in the teeth e of numeral wheels f. The intermediate gear wheels d and the numeral wheels are mounted on a common carriage f^1 which is adapted to be shifted in a direction parallel to the shaft b^2 which carries the setting disks. The rotary movement imparted to the setting disks b is transmitted to the numeral wheels according to the values set on the setting disks by shifting the desired number of teeth c thereof into operative positions, the arrangement being such that the numeral wheels are rotated either forward or backward according to the character of the calculation to be performed on the machine. At the side of each numeral wheel (except the first one from the right) a rocker n in the form of a hammer is located which is rocked at the proper time by a pin q secured to the cooperating numeral wheel into position for engagement with a carrying tooth k which is mounted on the coöperating setting disk b and is adapted to be rocked to the side by the rocker n. Ordinarily the said tooth is

held by a spring p in the rocked or inoperative position shown at the second disk b from the right, but it is rocked sidewise and into the teeth of the coöperating intermediate gear wheel d when it is engaged by a cam face n^1 formed on the hammer n as is shown at the left hand side of Fig. 1. Therefore according to the direction of rotation of the crank a the rocking carrying tooth k shifts the coöperating numeral wheel forward or backward a distance corresponding to one value. The setting disks are provided with cam faces b^1 by means of which the rockers n are returned into normal or inoperative positions after carrying has been performed. It may be added, that each setting disk is provided with two carrying teeth k one for right hand and the other one for left hand operation of the setting disks and numeral wheels, and that the teeth k corresponding to the same direction of revolution are disposed along a screw-thread, because the carrying operation can not be simultaneously performed in all the numeral wheels f, but must be performed successively in all the numeral wheels.

At the side of the main registering mechanism f a revolutions counting mechanism y is provided on the carriage f^1 which is operated from the shaft b^2 of the setting mechanism by means of a single tooth y^1, as is known in the art. Each of the registering mechanisms f and y is provided with resetting means adapted to be operated by a wing nut f^2 and y^2 respectively.

Above the setting mechanism b, c a second registering mechanism m is provided which is adapted to be operated by means of a rotary single tooth u adapted to engage in teeth m^1 of the numeral wheels m. The single tooth u is mounted on a shaft v which is adapted to be rotated from the crank a through the intermediary of gear wheels v^1 and v^2, and can be shifted on the shaft in longitudinal direction and from one numeral wheel m to another one. As shown the shifting means for the single tooth consist of an endless horizontal band w the upper branch of which has the single tooth connected thereto by a carrying member u^1, and the lower branch of which is connected to an arm x of the carriage f^1 supporting the main registering mechanism and the revolutions counting mechanism. This construction is shown and described in detail in the patent of the United States No. 1,007,618, granted to me October 31, 1911. The registering mechanism m is provided with resetting means indicated in Fig. 1 by a wing nut m^3. In the example illustrated in the figures, carrying is performed by means of a controlling member such for example as a roller h engaging at the proper time a movable lever or tooth g provided on the numeral wheel m and shifting the same in such a way that an arm g^1 of the said lever or tooth g shifts one of ten radially shiftable teeth i of the numeral wheel of the next higher order beyond the circumference of the wheel and into the path of a driving member revolving with the crank a. By the said driving member the coöperating numeral wheels m are shifted forward or backward a distance corresponding to one value. In order that in the resetting operation the ends g of the levers of the numeral wheels m are not engaged by the rollers h, the latter are mounted on a common slide h^1, and the slide is provided with an arm h^2 which is held by a spring h^3 in engagement with a notch of a disk m^4, as is shown in Fig. 1. The disk takes part in the rotation of the resetting shaft m^5 of the numeral wheels m, so that during the rotation of the wheels the slide h^1 is forced sidewise and its stops h get out of the paths of the heads g of the levers.

m^6 are same faces for re-shifting the teeth i. Instead of the radially shiftable tooth i laterally rockable teeth or wheels may be provided, which are similar in construction to the rocking teeth k. Such constructions have been shown by way of example in Figs. 4 and 5.

Now according to my present invention the carrying mechanism and more particularly the teeth i are arranged in such a way, that the shift tooth k of the registering mechanism f provides in its rocked position the driving member for the teeth i, for which purpose when shifted radially or rocked laterally the said teeth are shifted into the path of the shift tooth k, so that the shift tooth k actuates two separate carrying mechanisms, one of the said carrying mechanisms being actuated in the normal position of the tooth k and the other one in the rocked position thereof.

The example shown in Fig. 4 is distinguished from the one described in Figs. 1 to 3 in so far as instead of the radially shiftable teeth i of the numeral wheel m rocking teeth i^1 are provided, which are adapted to be rocked into operative positions by means of a radially shiftable arm g^2 of the lever g and to be returned into normal positions by returning cams such as stationary wedge shaped member m^2. In both end positions the teeth i^1 are locked by a spring actuated locking member i''.

In the example shown in Fig. 5 instead of the ten radially shiftable or laterally rocking teeth i, i^1 provided in the upper registering mechanism m a wheel r is provided which is adapted to be shifted laterally and into the path of the tooth k. In this example the movable lever g^2 of the adjacent wheel is provided at its bottom side with one or two beveled cam faces s, and not with an arm g^1, so that it can shift the wheel r which

is movable relatively to the numeral wheel *m* in opposition to the action of a spring *t* and into the path of the driving member *k*.

I claim herein as my invention:

In a calculating machine, the combination with the setting disks, main registering mechanism adapted to be operated by said setting disks, and additional registering mechanism and its operating means, of carrying mechanism controlled by the main registering mechanism and comprising at least one member mounted on the setting disks and adapted to be laterally rocked into and out of operative or carrying position, normally inoperative carrying means for the additional registering mechanism adapted to be operated by said member when in inoperative or non-carrying position relatively to the main registering mechanism, and means to throw the carrying mechanism for the additional registering mechanism into operative position.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

FRANZ TRINKS.

Witnesses:
WILSSAHN LEHRKE,
KARL MUNDT.