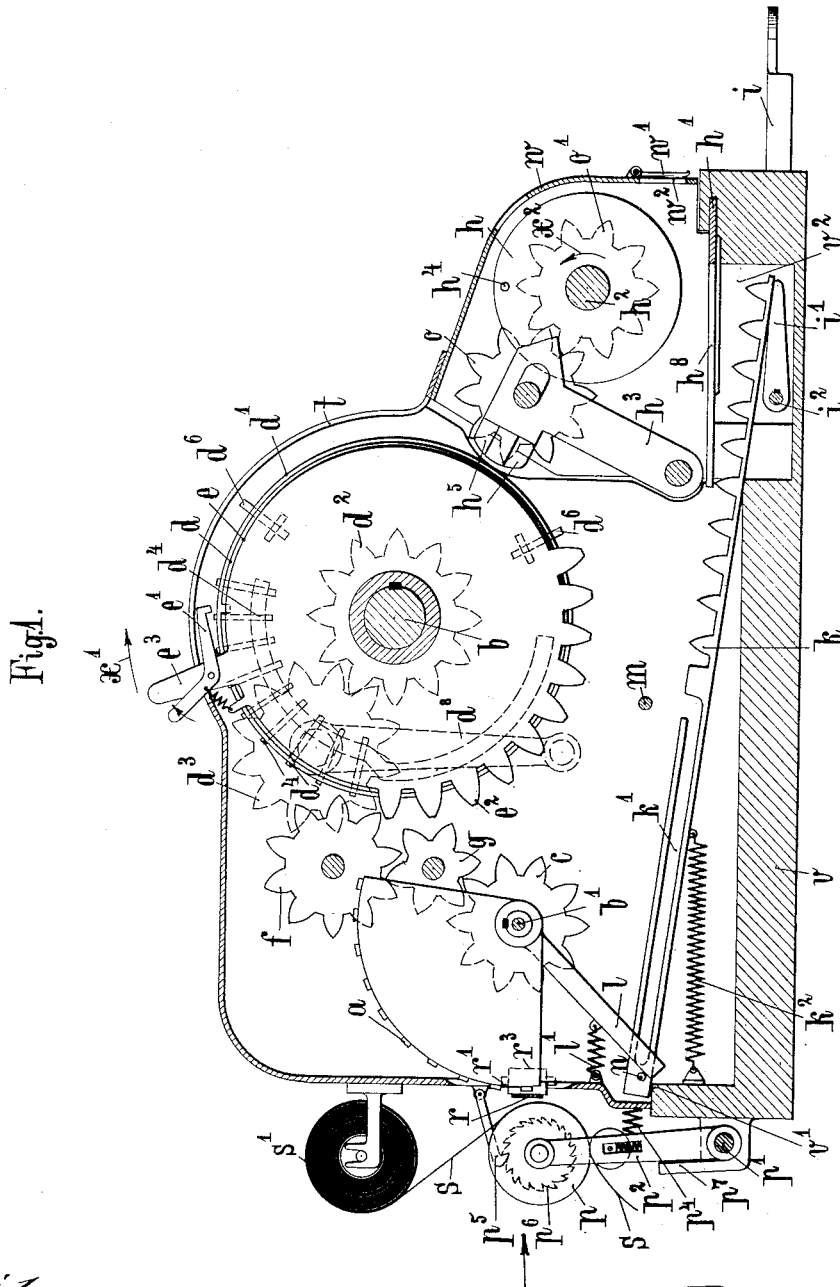


F. TRINKS.
 CALCULATING MACHINE.
 APPLICATION FILED APR. 25, 1912.

1,039,614.

Patented Sept. 24, 1912.

2 SHEETS—SHEET 1.



Witnesses:

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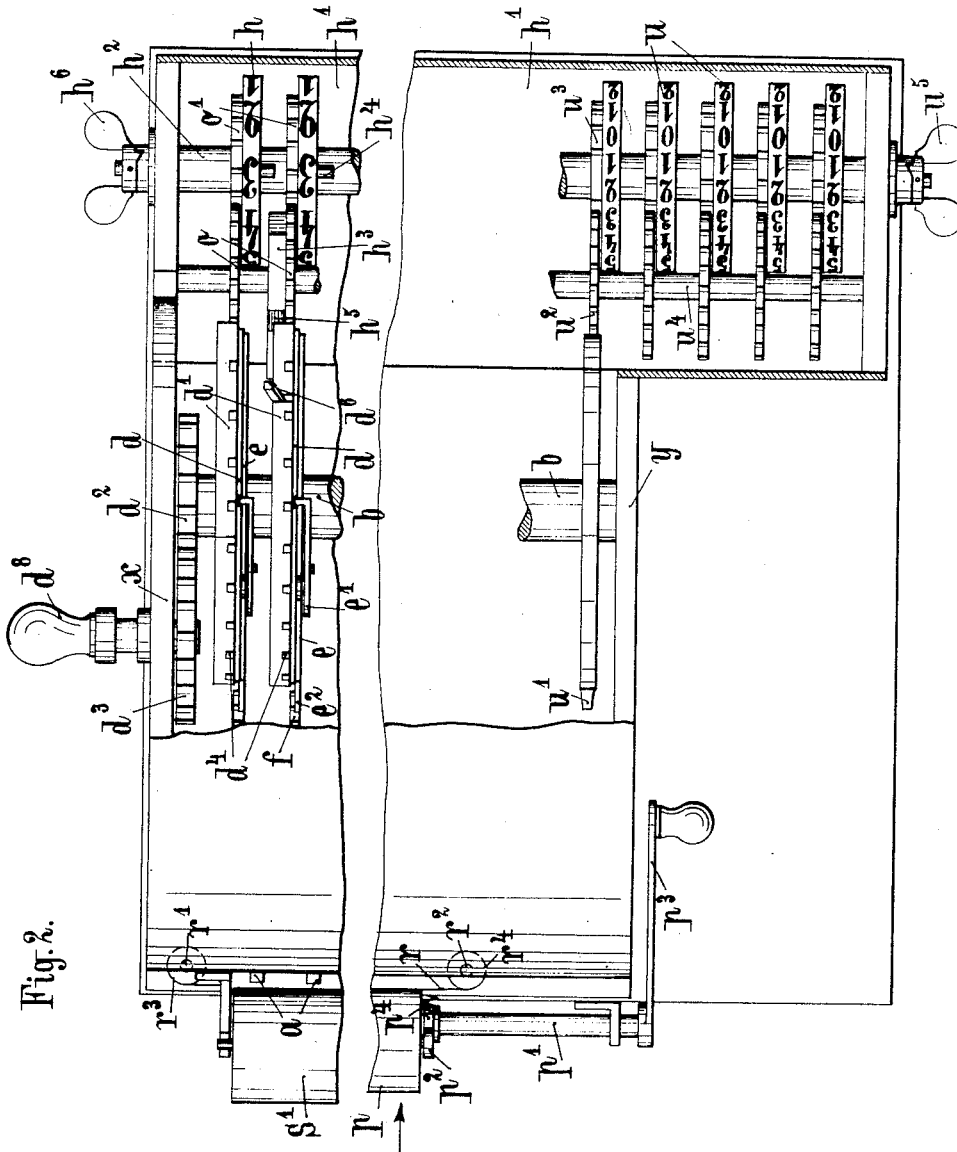


Fig. 2.

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UNITED STATES PATENT OFFICE.

FRANZ TRINKS, OF BRUNSWICK, GERMANY.

CALCULATING-MACHINE.

1,039,614.

Specification of Letters Patent.

Patented Sept. 24, 1912.

Application filed April 25, 1912. Serial No. 693,181.

To all whom it may concern:

Be it known that I, FRANZ TRINKS, manufacturer, a citizen of the Duchy of Brunswick, Empire of Germany, residing at 71 Kastanienallee, 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 printing mechanism for calculating machines, and more particularly in printing mechanism of the class shown and described in the Patent of the United States No. 953,242, granted to me March 29, 1910. In this patent a calculating machine is shown in which the values set on the setting mechanism are recorded when rotating the machine crank by means of printing mechanism.

The object of the present improvements is to provide a printing mechanism by means of which the result of a calculation displayed by the registering mechanism is recorded.

With this object in view my invention consists in providing an operative connection between the numeral wheels of the registering mechanism and the printing mechanism, which connection can at will be thrown out of operation, and includes a coupling mechanism which acts in one direction only, so that the printing mechanism can be operated as well from the setting disks as from the numeral wheel of the registering mechanism.

For the purpose of explaining the invention an example embodying the same has been shown in the accompanying drawings, in which the same letters of reference have been used in all the views to indicate corresponding parts.

In said drawings—Figure 1, is a cross-section of a typewriting-calculating machine, and Fig. 2, is a plan view thereof with the cover removed.

Referring to the example illustrated in the drawings, in the lateral uprights x , y of the machine casing a shaft b is mounted for rotation, which is adapted to be rotated from the machine crank d^3 acting through the intermediary of spur gears d^2 , d^1 . To the said shaft setting disks d^1 are secured each of which is equipped with nine radially movable teeth d^4 adapted to be shifted into or out of operative positions by a rotary cam disk d mounted coaxially with the disk. For rotating the cam disk d relatively

to the setting disks d^1 disks e with handles e^3 are loosely mounted at the sides of the said cam disks, which can be coupled to the latter by bell crank levers e^1 . Each of the bell crank levers projects with one of its arms through a slot t made in the upper wall of the casing to points adjacent to the handles e^3 of the disks e , and by forcing a handle e^3 and the adjacent arm of the bell crank lever e^1 together and turning the cam disk d at the proper angle in the direction of the arrow x^1 shown in Fig. 1, the desired number of teeth d^4 is set on the setting disk d^1 in operative position. When rotating the setting disks d^1 by means of the machine crank, such rotation is transmitted through the intermediary of gear wheels o , o^1 to the numeral wheels h of the main registering mechanism, which is mounted on a carriage h^1 movable in a direction parallel to the axis b of the setting mechanism. The numeral wheels are placed on a common shaft h^2 rotatably mounted on the said carriage, and equipped at its end with a thumb nut h^6 by means of which the numeral wheels can be reset. The carriage is shiftable in order to permit the setting disks to be used for operating the numeral wheels of the higher orders. The main registering mechanism is equipped with carrying mechanisms which in the example shown consist of levers h^3 in the form of hammers. When one of the numeral wheels h passes from nine to zero, or vice versa, the corresponding hammer is rocked by a pin h^4 secured to the numeral wheel, so that a beveled part h^5 of the lever h^3 is set in the path of a rocking tooth d^5 of the setting disk d^1 and forces the same into position for engagement with the teeth of the intermediary gear wheel o of the numeral wheel of the next higher order. Thereby the said numeral wheel is shifted one tooth forward or backward. Each of the hammers h^3 coöperates with two rocking teeth d^5 , one of the said teeth being operative for right hand rotation of the machine crank d^3 , and the other one for left hand rotation thereof.

Coaxially of the main registering mechanism h a revolutions counting mechanism u is mounted on the carriage h^1 , by means of which the number of the revolutions of the machine crank is registered. The said revolutions counting mechanism is operated by means of a single tooth wheel u^1 secured to the axis b of the setting mechanism and

adapted to engage in the teeth of one of a plurality of intermediary spur gears u^2 once for each rotation of the machine crank. Each of the numeral wheels u coöperates
 5 with an intermediary gear wheel u^2 of its own, and each of the said intermediary gear wheels is in mesh with gear teeth u^3 connected with the corresponding numeral wheel. All the intermediary wheels are
 10 preferably loosely mounted on a common shaft u^4 . For resetting the revolutions counting mechanism a thumb nut u^5 is provided on the shaft carrying the numeral wheels of the revolutions counting mechanism.
 15

The disks e are formed at their circumferences with teeth e^2 which upon rotation of the disk in the direction of the arrow shown in Fig. 1 engage in gear wheels f and carry
 20 the same along. Thereby also sector shape type carriers a are rotated, which are connected with the gear wheels f through the intermediary gear wheels g and c . Each of the type carriers a carries at its circumference the types of the numerical characters from "1" to "9," and the "0" sign, and the ratio of the numbers of the teeth of the disk e , and the gear wheels f , g , c is such, that for example when setting four teeth d^4
 25 on a setting disk d^1 the type "4" is brought into printing position on the corresponding type carrier a . When shifting the disk e backward into the normal position shown in Fig. 1, the type carrier a is likewise set
 30 to "0."

Printing of the value set on the type carrier a is effected by means of a platen p which is mounted for rotation on a rocking lever p^2 fulcrumed on a horizontal shaft p^1 .
 40 By means of a crank p^3 or the like the platen p can be thrown in the direction of the arrow, so that a web s of paper taken from a roll s^1 thereof is forced against an ink ribbon r passed in front of the types of the type carrier a . When releasing the crank p^3 a spring p^4 throws the platen p backward into its normal position and in contact with a stop p^7 . In this position the platen is fed one step by means of a ratchet wheel p^6
 50 connected with the axis of the platen and a pawl r^5 coöperating therewith, whereby the web of paper s is fed one step so as to be ready for the next printing operation. The inking ribbon r may be wound on two spools
 55 r^3 and r^4 which are rotatably mounted on two vertical spindles r^1 and r^2 respectively, and are connected with the platen p by any suitable step by step feeding mechanism (not shown), so that the ribbon r is automatically
 60 fed upon each return movement of the platen p . Mechanisms of this kind are known in the art and therefore need no detailed description. Printing may also be effected by other means. For example the platen,
 65 whether in the form of a cylinder as shown,

or of a punch, may be operated from the machine crank d^8 , as has been described in my aforesaid letters patent.

Referring now to those parts to which my invention more particularly relates, between
 70 the numeral wheels h of the main registering mechanism and the type carrier a an operative connection is provided, which may be thrown out of operation, and is provided
 75 with coupling means operative in one direction only, so that the type carriers a can be operated either from the setting levers e or from the main registering mechanism h . The said connection must be thrown into
 80 operative position, before the numeral wheels are reset by means of thumb nut h^6 . When resetting is completed, the type carrier a shows the value which before resetting was displayed by the main registering mechanism. After printing has been effected in
 85 the manner described, or in another way, the connection may again be thrown out of operation, whereupon any suitable means, such for example as a weight, or a spring, are used to return the type carriers into their
 90 zero positions.

In the example illustrated in the drawings the connections, between the numeral wheels of the main registering mechanism and the type carriers a consist of toothed racks k ,
 95 which with one of their ends bear on shoulders v^1 formed in the rear wall of the machine casing, and with their opposite ends on arms i^1 secured to a horizontal rock shaft i^2 provided with a hand lever i . By
 100 lifting the latter the toothed racks k can be thrown into engagement with the gear wheels o^1 of the corresponding numeral wheels h which are located above the same. After the racks have thus been brought into
 105 engagement with the said gear wheels, the resetting shaft h is turned in the direction of the arrow x^2 shown in Fig. 1. Thereby the gear wheels o^1 pull the racks to the right. When thus being shifted the racks
 110 ride with their right hand ends on the arms i^1 and with their left hand ends on pins m engaging in longitudinal slots k^1 of the racks, and they pass through slots w^2 made in the front wall of the carriage casing and
 115 normally closed by hinged and yielding cover plates w^1 . The racks k are equipped with pins n which are adapted to engage at the rear of arms l respectively secured to the type carriers, so that the racks k when
 120 shifted as described carry along the arms l and set the type carriers a according to the lengths of their movements. After the racks have been disengaged from the gear wheels o^1 of the numeral wheels by rocking
 125 the hand lever i downward, the racks and the type carriers are retracted into their normal or inoperative positions by weights or, as shown, by springs k^2 and l^1 .

The pins n and the arms l provide the 130

coupling mechanism which as stated above acts in one direction only, and they permit the type carriers to be set by means of the disks e , because the levers l can be removed from the pins n .

In order that the shifting movement of the carriage is not interfered with by the racks k , the carriage is formed in its bottom with slots h^3 through which the racks pass downward when being disengaged from the gear wheels o^1 , so that they extend normally below the bottom of the carriage and into notches v^2 made in the stationary base plate v of the machine frame.

While in describing the invention reference has been made to a particular embodiment of the same and to the construction of details which in my opinion serve the purpose best, I wish it to be understood, that my invention is not limited to the construction shown in the drawings, and that various changes may be made in the general arrangement of the mechanism and the construction of its parts, without departing from the gist of my invention. For example the toothed racks may be substituted by other members adapted to perform the same function. Also the coupling means which as shown consist of the pins n and arms l may be constructed in a different way.

I claim herein as my invention:

1. In a calculating machine, the combination with the setting mechanism, and the registering mechanism, of printing mechanism cooperating with the setting mechanism, and means to establish an actuating connection between said registering mechanism and printing mechanism and operative either from the setting mechanism or from the registering mechanism.

2. In a calculating machine, the combination with the setting mechanism, and the registering mechanism, of printing mechanism cooperating with the setting mechanism, and means to establish an operative connection between said registering mechanism and printing mechanism, said connection being independent of the operation of the printing mechanism by the setting mechanism.

3. In a calculating machine, the combi-

nation with the setting mechanism, and the registering mechanism, of printing mechanism cooperating with the setting mechanism and disconnected therefrom in the zero position of the setting mechanism, and means to establish an operative connection between said registering mechanism and printing mechanism.

4. In a calculating machine, the combination with the setting mechanism, and the registering mechanism, of printing mechanism cooperating with the setting mechanism, and means to establish an operative connection between said registering mechanism and printing mechanism, said connection comprising a coupling member which is inoperative for transmitting movement from the printing mechanism to said connection.

5. In a calculating machine the combination with the setting mechanism, and the registering mechanism, of printing mechanism comprising a rocking type carrier, a connection operative when setting the setting mechanism between the setting mechanism and type carrier, and normally inoperative means to transmit resetting movement from the registering mechanism to the type carrier, said means being independent of the movement of the type carrier when set by the setting mechanism.

6. In a calculating machine the combination with the setting mechanism, and the registering mechanism, of printing mechanism comprising a rocking type carrier, a gearing intermediate from the setting mechanism and type carrier and disconnected from the setting mechanism in the zero position thereof, a rack loosely connected with said type carrier, and means to throw said rack into engagement with the registering mechanism, said rack being adapted to transmit resetting movement of the registering mechanism to the type carrier.

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

FRANZ TRINKS.

Witnesses:

WILHELM LEHRKE,
JULEUS SECKEL.