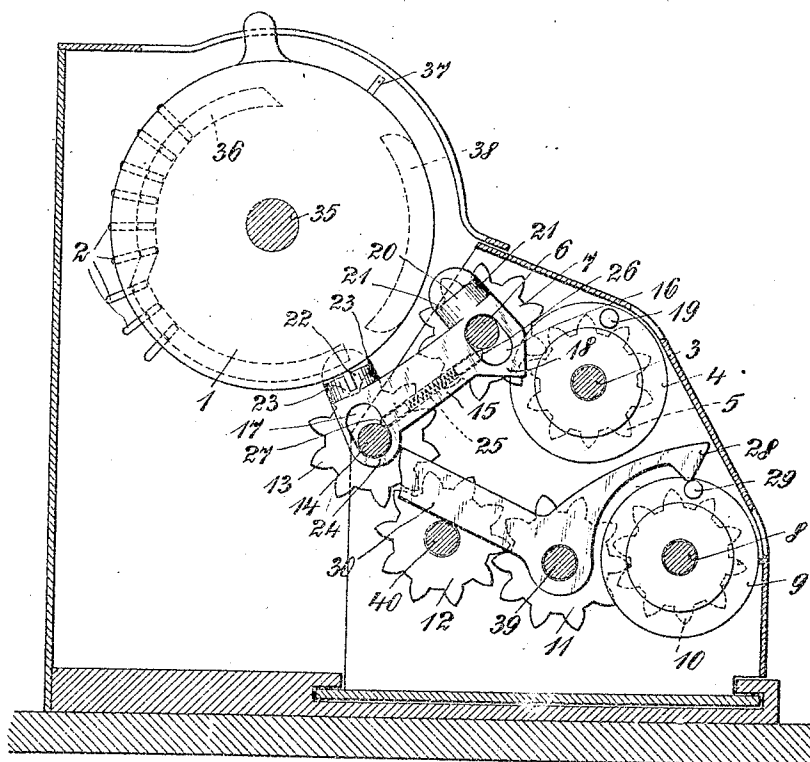


E. SCHUSTER.
 CALCULATING MACHINE.
 APPLICATION FILED JUNE 27, 1911.

1,008,079.

Patented Nov. 7, 1911.
 2 SHEETS-SHEET 1.

Fig. 1.



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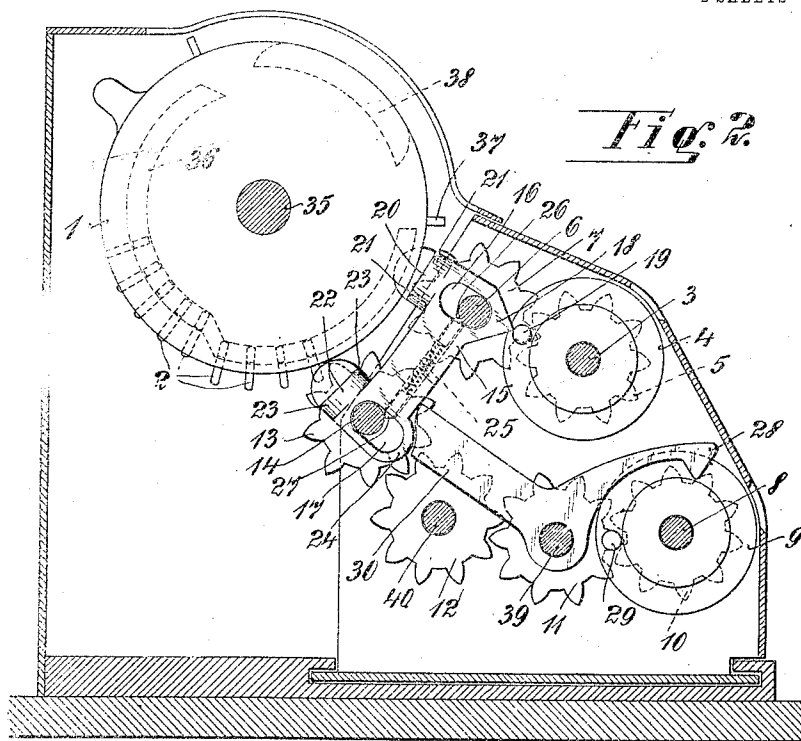
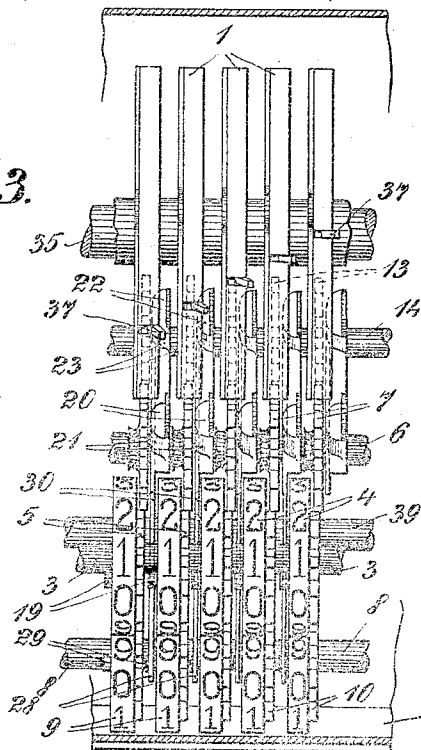


Fig. 3.



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UNITED STATES PATENT OFFICE.

ERNST SCHUSTER, OF BERLIN, GERMANY.

CALCULATING-MACHINE.

1,008,079.

Specification of Letters Patent.

Patented Nov. 7, 1911.

Application filed June 27, 1911. Serial No. 635,562.

To all whom it may concern:

Be it known that I, ERNST SCHUSTER, a citizen of the German Empire, residing at Berlin, in the Kingdom of Prussia, Germany, mechanical engineer, have invented certain new and useful Improvements in Calculating-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in calculating machines, and more particularly in calculating machines of the class shown and described in my copending application Ser. Nr. 507,839, filed July 15, 1909; in which two registering mechanisms are provided which coöperate with the same setting mechanism.

My invention relates more particularly to the carrying mechanism. And the object of the improvements is to provide a carrying mechanism for the registering mechanisms which is simple in construction.

With this object in view my invention consists in providing the same member, preferably in the form of a rocking lever, which is actuated by either one of the registering mechanisms for effecting the carrying operation.

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 the calculating machine showing a side view of the setting mechanism, the registering mechanisms, and the carrying mechanisms, Fig. 2, is a similar cross-section showing the actuating member or lever for the carrying mechanisms in a different position, and Fig. 3, is a partial front view of the machine with the cover removed.

On a shaft 35 mounted in the side walls of the casing of the machine a plurality of adjusting or setting disks 1 are located each of which is provided with nine teeth 2 adapted to be shifted outward into operative position by means of a cam disk the cam face 36 of which has been shown in

dotted lines in Figs. 1 and 2. Furthermore the said setting disks carry two teeth 37, 37 for effecting the carrying operation in the registering mechanisms. Normally the said carrying teeth are in inoperative position in which they are rocked laterally and out of the plane of the teeth 2, and they are held in this position by springs, as has been described more in detail in United States Patent to Hamann, Nr. 772,935, dated Oct. 25, 1904. For performing a carrying operation the carrying teeth are adapted to be temporarily rocked into the plane of the teeth 2 by means of a rocking lever 15. It will be understood, that at a time only one of the teeth is thus rocked into operative position, one of them being used for addition or multiplication and the other one for subtraction and division. On a shaft 3 disposed in front of and below the shaft 35 one of the registering mechanisms is located which comprises a plurality of number disks 4 and gear wheels 5, one gear wheel being connected with each of the number wheels. The said gear wheels are in mesh with intermediary gear wheels 7 mounted on a common shaft 6. The teeth 2 and, under certain circumstances, either one of the carrying teeth 2, are adapted to operate the said intermediary wheel 7, and through the latter and the gears 5 the number wheels 4. Below the shaft 3 and in front thereof a second registering mechanism is provided the number wheels 9 and toothed gear wheels 10 of which are disposed on a common shaft 8. The latter are likewise adapted to be operated by the teeth 2 and 37 through the intermediary of spur gears 11, 12, and 13 mounted respectively on shafts 39, 40, and 14.

Adjacent to each of the gears 7 and 13 a rocking lever 15 is located which near its ends is formed with transverse slots 16 and 17 by means of which it is supported on the shafts 6 and 14 of the wheels 7 and 13. The front end of each of the levers 15 is provided at its lower side with a boss 18 having inclined side faces and normally extending into the path of a pin 19 secured to the side of the number disk 4. At its opposite side the lever is formed with a projection 20 and inclined cam faces 21 which are

adapted to shift either one of the carrying teeth 37 into operative position whereby the registering disk of the next higher denomination is shifted one tooth, as has been described more in detail in the aforesaid patent to Hamann. The lower and rear end of each of the rocking levers 15 is formed with a similar projection 22 and inclined cam faces 23 which are likewise adapted to shift the teeth 37 into operative position. At the opposite side the lever is provided with a semicircular boss 24. Each of the levers 15 is formed with a longitudinal slot 38 from which pins 26 and 27 actuated by a spring 25 project into the slots 16 and 17. The said pins engage with their front ends the surfaces of the shafts 6 and 14 and tend to yieldingly lock the levers in position.

On the shaft 39 which carries the spur gears 11 bell crank levers 30 are mounted which at one of their ends are formed with noses 28 similar in form to the noses 18 and extending in the path of pins 29 secured to the side faces of the number wheels 9. The opposite arm of the said bell crank lever extends to a point adjacent the rounded projection 24 of the lever 15, and it is adapted when rocked by the pin 29 to shift the end of the lever 15 upward with its cam faces 23 in the path of the carrying teeth 37.

Normally the levers 15 are in their inoperative positions in which the shafts 6 and 14 are in contact with the upper side walls of the slots 16 and 17, and they are held in this position by the spring actuated pins 26 and 27. If however in one of the registering mechanisms a carrying operation must be performed, the cooperating end of the corresponding lever 15 is rocked upward with the cam faces 21 or 23 into the path of the corresponding teeth 37. In Fig. 1 the parts are shown in the position in which the rear or lower end of the lever 15 has been rocked upward, so that carrying is performed in the lower registering mechanism, while in Fig. 2 the parts are shown in the position in which the front or upper end of the lever has been rocked upward, so that carrying is performed in the upper registering mechanism. It will readily be understood, that the pins 19 operate through the cam faces 18, while the pins 29 operate through the intermediary of the bell crank lever 30 and the rounded projection 24. By the cam face 21 or 23 which has thus been rocked upward one of the teeth 37 is shifted into the plane of the teeth 2, so that it engages the gear wheel 7 or 13 of the next higher denomination and advances the same one tooth.

To return the levers 15 into their normal or inoperative positions any known or preferred means may be provided. In the example illustrated cam faces 38 are provided on the setting disks which engage the rocked

ends of the levers 15 and force the same backward into inoperative positions.

I claim herein as my invention:

1. In a calculating machine, the combination with the setting mechanism adapted to have values set thereon, a plurality of registering mechanisms, and means to transmit the values set on the setting mechanism to said registering mechanisms, of carrying mechanisms for said registering mechanisms adapted to be operated by said setting mechanism, and means adapted to be operated by both of said registering mechanisms to cause said setting mechanism to perform a carrying operation.

2. In a calculating machine, the combination with the setting mechanism adapted to have values set thereon, a plurality of registering mechanisms, and means to transmit the values set on the setting mechanism to said registering mechanisms, of carrying mechanisms for said registering mechanisms adapted to be operated by said setting mechanism, and a rocking member adapted to be rocked by said registering mechanisms and to cause said setting mechanisms to perform a carrying operation in the registering mechanism.

3. In a calculating machine, the combination with a setting mechanism provided with teeth adapted to be shifted into operative positions and a normally inoperative carrying tooth, and two registering mechanisms adapted to be actuated by the shifted teeth of the setting mechanism and the carrying tooth, of a lever adapted to be rocked at each of its ends by said registering mechanisms and when rocked to shift said carrying tooth into operative position, and means to return said rocking lever into inoperative position.

4. In a calculating machine, the combination with the setting mechanism adapted to have values set thereon, two registering mechanisms, and means to transmit the values set on the setting mechanism to said registering mechanisms, of carrying mechanisms for said registering mechanisms adapted to be operated by said setting mechanism, a rocking lever adapted to be rocked by one of said registering mechanisms, and a rocking member adapted to be rocked at one end by said rocking lever and at its opposite end by the registering mechanism which does not act on the rocking lever, said rocking member being adapted when rocked to cause said setting mechanism to perform a carrying operation in the registering mechanism which has rocked the rocking member.

5. In a calculating machine, the combination with the setting mechanism adapted to have values set thereon, a registering mechanism, and means to transmit the values set on the setting mechanism to said registering mechanism, of carrying mechanism for said

registering mechanism adapted to be operated by said setting mechanism, a rocking member adapted when rocked to cause said setting mechanism to perform a carrying
5 operation, a lever adapted to be rocked by the registering mechanism and to rock said rocking member.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

ERNST SCHUSTER.

Witnesses:

HENRY HASPER,
WOLDEMAR HAUPT.