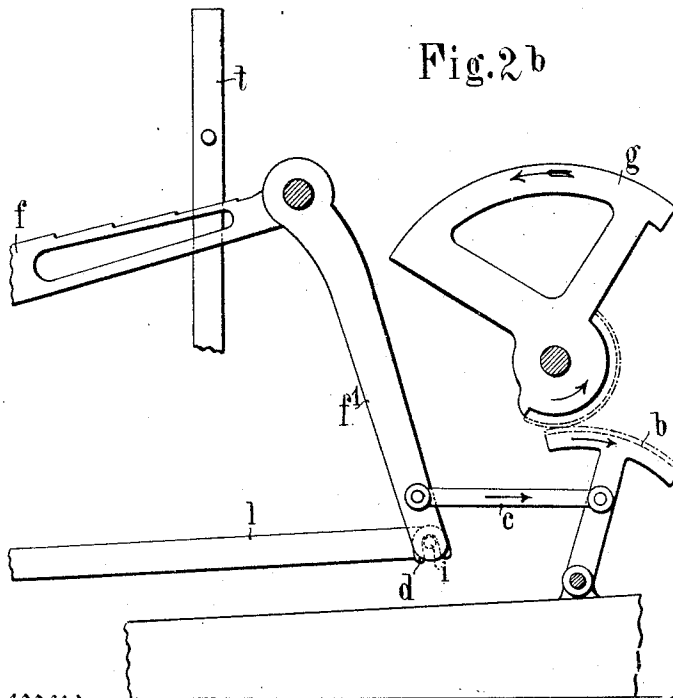
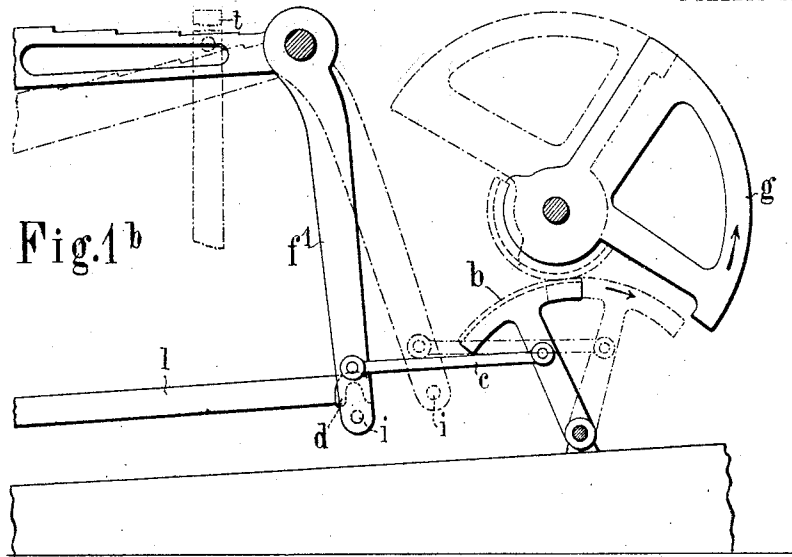


B. BEHR.
 CALCULATING MACHINE WITH PRINTING DEVICE.
 APPLICATION FILED AUG. 28, 1911.

1,041,576.

Patented Oct. 15, 1912.

2 SHEETS—SHEET 1.



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UNITED STATES PATENT OFFICE.

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CALCULATING-MACHINE WITH PRINTING DEVICE.

1,041,576.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, BERNHARD BEHR, citizen of the Kingdom of Saxony, residing at Dresden, Germany, have invented certain new and useful Improvements in Calculating-Machines with Printing Devices, of which the following is a specification.

It is known to employ disks having spirally increasing notches in calculating machines, for the purpose of transmitting the total in the adjusting mechanism to the type mechanism. It is possible on transmitting to the total to move figure disks to a lower number so that an incorrect result is printed. The machine is accordingly locked for the plus movement, but not simultaneously also for the minus movement. For simultaneously also locking the minus movement disks provided with radially directed notches or recesses are employed, according to this invention, in which at the moment of transmitting the total operated pins engage, which are independent of the calculating mechanism, thereby locking the figure disks and the complete calculating mechanism. Any further movement of the crank or the lever is thus prevented. As the locking device is independent of the calculating mechanism *i. e.* of the adjustable ruler, the ruler can be adjusted independently of the stationary adjusting device. It is not necessary in the practical calculation of decimal figures to print the complete total, but only that part which comes in question practically. Consequently the ruler is moved, before printing, such a distance to the right that the surplus decimals are beyond the adjusting means for printing the total which has remained stationary. By this arrangement, on the comma changing its position, the commas are brought one under the other for the purpose of subsequent addition, which is of great importance for carrying out and checking the addition.

In the accompanying drawing:—Figures 1^a and 1^b, together show the machine in side elevation out of operation, the parts not required for explanation being omitted. Figs. 2^a and 2^b, together show a side elevation of the device in the operative position. Fig. 3 is a plan of a figure disk. Fig. 4 is a modification according to which the notched

disk is omitted, and the figure disk itself is employed as the notched disk. Fig. 5 is a vertical section of Fig. 4.

On the bevel wheel of the change gear α connected to the ruler s is mounted a disk o , which is shown in plan in Fig. 3. This disk is provided with peripheral notches of various depths corresponding to the numbers 1 to 9.

In the front wall of the machine are mounted rods n which under the action of spiral springs m engage with the peripheral notches of the disks o . The rear end of the spring operated rods n is hinged to a bell-crank lever h which is hinged to an arm k provided on the front wall of the machine. The free end of the bell-crank lever h is detachably connected by means of a rod l to the end of the bell-crank-lever f ^{f^1} . This bell-crank lever f ^{f^1} (known from application Ser. No. 558715) is at the front end of one arm provided with a toothed segment e which correspondingly to the depression of the keys t adjusts the corresponding figure disk. The detachable connection between the rod l and the end of the arm of the bell-crank lever f ^{f^1} consists in providing the lever l with a forked end d which engages with a pin i of the lever arm f^1 . The lever arms f^1 are by means of links o connected to the toothed segment levers b which in the known manner engage with the teeth of the type segment g . Below the rod l is rotatably mounted a pawl r of which one end abuts against the lower edge of the rod l . The other end of the pawl r is by means of a rod a connected to the operating lever p . The operating lever p is rotatably mounted on the shaft z which traverses the machine. For purpose of withdrawing the separate rods n simultaneously from the notches of the notched disks o by means of a single operating lever p , there are mounted on the rotary shaft z disks v for each corresponding rod n which disks by means of a slot engage with the pins w of the rods o .

In the position of the device illustrated in Fig. 1^a, the separate rods n are withdrawn from the notches of the disk by rotating the hand lever p . Simultaneously the lower end of the hand-lever p which is provided as a bell-crank lever, has moved the connecting rod q to the right whereby the pawl r has

raised the fork d of the rod l from the pin i of the bell-crank lever arm f^1 . Consequently on depressing the keys t only the figures corresponding to the keys t are transmitted to the writing mechanism, or the type segment g . If, however, the lever p is moved in the direction of the arrow, to the right, as shown in Fig. 2^a, then the rods n by means of their springs m are pressed into the notches of the disk o . Simultaneously the pawl r is rotated and the forked end d of the rod l engages with a pin i of the bell-crank lever arm f^1 so that in consequence of the coupling of the separate rods n to the toothed segment b each segment makes a movement corresponding to the corresponding figure and adjusts the corresponding segment with a corresponding type under the hammer of the writing mechanism.

In Thomas calculating machines in which, as is known, it is also possible to simultaneously multiply, there exists in an extremely annoying manner, in consequence of the extraordinary rapid rotation of the figure disks by means of the crank, a centrifugal action which leads to incorrect calculations. For this reason it is possible according to Figs. 4 and 5 to omit the special notched disk and to provide the figure disks themselves with peripheral notches so that the figure disk simultaneously serves as notched disk. In this manner the mass set in motion is substantially reduced, especially by the reduction in material in consequence of the peripheral notches in the figure disk which are therefore themselves also substantially reduced in weight.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. In a calculating machine provided with printing mechanism and a figure device, the combination with rotatable disks provided with radial notches of different depth corresponding to the different number of values, and spring controlled devices arranged to

engage the notches in said disks to arrest rotation thereof, substantially as described.

2. In a calculating machine provided with printing mechanism and a figure device, the combination with rotatable disks provided with radial notches of different depths and figures or characters of different value adjacent said notches, and spring controlled rods arranged to engage the notches, in said disks to arrest rotation thereof, substantially as described.

3. In a calculating machine provided with a figure device, the combination with rotatable disks provided with radial notches of different depths corresponding to numbers of different values, spring controlled rods for engagement with said notches to arrest rotation of said disks, an operating shaft, notched segments on said shaft, one for each rod, said rods having pins lying in the notches of said segments, and means for operating said shaft to withdraw said rods from engagement with said disks, substantially as described.

4. A calculating machine provided with a figure device, the combination with rotatable disks provided with radial notches of different depths corresponding to the numbers of different values, spring controlled rods for engagement with said notches to arrest rotation of said disks, an operating shaft, notched segments on said shaft, one for each rod, said rods having pins lying in the notches of said segments, means for operating said shaft to withdraw said rods from engagement with said disks, and link mechanism operated upon movement of said shaft, substantially as and for the purposes set forth.

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

BERNHARD BEHR.

Witnesses:

PAUL ARRAS,
CLÄRE SIMON.