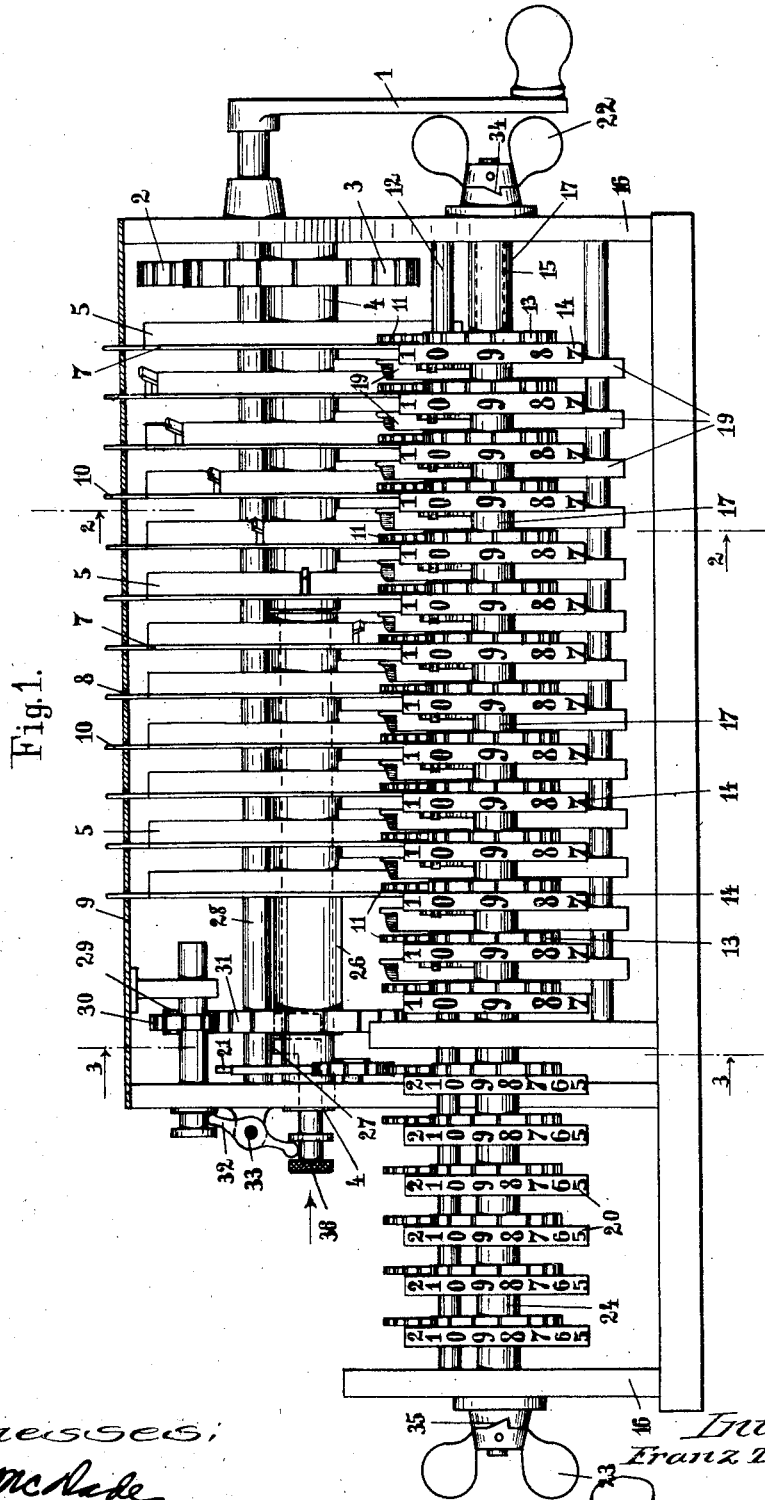


F. TRINKS.
 CALCULATING MACHINE.
 APPLICATION FILED APR. 15, 1913.

Patented Apr. 21, 1914.
 2 SHEETS—SHEET 1.

1,094,275.



Witnesses:
 M. E. McNamee
 C. J. Kessler

Inventor
 Franz Trinks
 James L. Morris
 Attorney

F. TRINKS.
 CALCULATING MACHINE.
 APPLICATION FILED APR. 15, 1913.

1,094,275.

Patented Apr. 21, 1914.

2 SHEETS-SHEET 2.

Fig. 2.

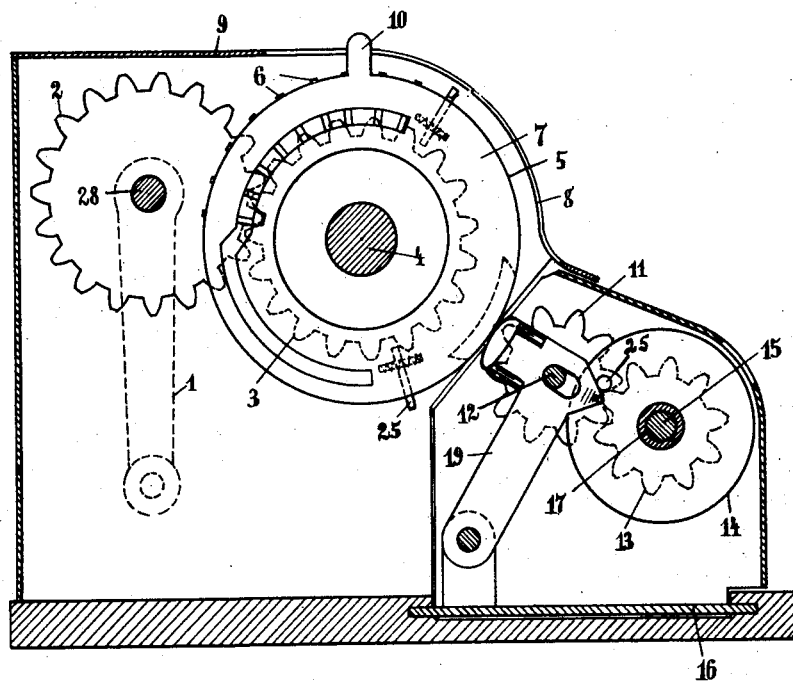
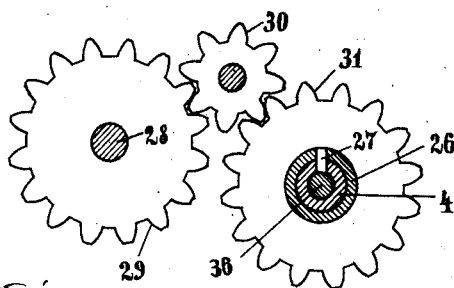


Fig. 3.



Witnesses:

M. E. McAdams

[Signature]

Inventor
 Franz Trinks

by

[Signature]
 Attorney

UNITED STATES PATENT OFFICE.

FRANZ TRINKS, OF BRUNSWICK, GERMANY.

CALCULATING-MACHINE.

1,094,275.

Specification of Letters Patent.

Patented Apr. 21, 1914.

Application filed April 15, 1913. Serial No. 761,307.

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 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 of the type shown and described in my prior United States Patents, Nos. 928,083, 1,038,464, and 1,040,059, granted, respectively, July 13, 1909, September 10, 1912, and October 1, 1912. As shown in these patents, a calculating machine of this type includes a setting mechanism which consists of setting disks which are adapted to be simultaneously rotated and are equipped with radially shiftable teeth controlled by cam disks.

The object of the present improvements is to provide a machine of the type indicated by means of which two different kinds of calculations, such as addition and subtraction, or multiplication and division, can simultaneously be performed, though only one setting mechanism is employed, and which on the other hand permits the use of a great number of setting disks in all of the said operations.

With this object in view my invention consists in dividing the setting mechanism into two groups of setting disks and so mounting the said groups and their driving mechanisms, that by the rotation of the machine crank one of the groups of adjustable setting disks can be rotated at will either in the same direction as the disks of the other group or in the opposite direction.

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

In said drawing Figure 1, is a front view of the calculating machine with the cover of the casing partly removed, Fig. 2, is a vertical cross-section taken on the line 2—2 of Fig. 1, and Fig. 3 is a vertical cross-section of a detail taken on the line 3—3 of Fig. 1.

For the purpose of explaining the invention I have shown a calculating machine in which a registering mechanism and a revolutions counting mechanism are mounted in front of the setting mechanism and on a

carriage which is longitudinally shiftable in a direction parallel to the axis of the setting mechanism. The general construction of these parts is known in the art and is shown for example in my aforesaid patents. Therefore a brief description will be sufficient for a clear understanding of the invention.

On a main shaft 4 a setting mechanism is mounted which consists of a plurality of equidistant setting disks 5. The shaft 4 is adapted to be rotated by means of a crank 1 mounted on a shaft 28 through the intermediary of gear wheels 2 and 3. Each of the setting disks 5 is provided with nine radially shiftable teeth 6 and with a cam disk 7 adapted to shift the said teeth inward or outward, the cam disk being formed with a hand piece 10 projecting through a slit 8 formed in the cover 9 of the casing of the machine. In front of the setting mechanism intermediate gear wheels 11, one for each of the setting disks, are loosely mounted on a shaft 12, and the said intermediate gear wheels are adapted to be rotated by means of the teeth of the setting disks which have been shifted outward by their cam disks. The intermediate gear wheels are in mesh with gears 13 connected to numeral wheels 14 which are loosely mounted on a shaft 15 and are held at their proper distances apart by spacing sleeves 17. When the intermediate gear wheels are rotated by the setting disks, the numeral wheels are rotated forward or backward at angles which correspond to the number set on the respective setting disks 5. The shafts 12 and 15 are mounted on a carriage 16 which can be shifted in a direction parallel to the shaft 4. The numeral wheels 14 which form the registering mechanism are provided with carrying devices which have been indicated in the drawing by teeth 25 adapted to be actuated by hammers 19. The carrying mechanism is described more in detail in my aforesaid patents, so that a detailed description is not necessary.

At the side of the registering mechanism 14 and co-axially therewith a mechanism 20 for counting the revolutions of the machine crank 1 is provided, and the said revolutions counting mechanism is adapted to be turned forward or backward one step for each rotation of the machine crank by means of a single tooth 21 provided on or rotating with the main shaft 4.

Resetting devices are provided on the reg-

istering mechanism and revolutions counting mechanism, which as shown consist of thumb nuts 22 and 23 provided with cam faces 34 and 35 respectively and adapted to
 5 shift the shafts 15 and 24 axially at the beginning of their operation and thereby to move radial pins provided on the said shafts in position for engagement with noses provided on the numeral wheels so as to return
 10 the same into their zero positions. Devices of this class are known in the art, and they have been described in detail in my said patents, so that a detailed description is not necessary.

15 Referring now to those parts to which my invention more particularly relates, the group of setting disks 5 which are located at the left in Fig. 1 are separated from the group of setting disks which are located at
 20 the right hand part of the machine, so that they can be rotated independently of the latter. In the example shown in the drawing the group of setting disks which is located at the left of the machine is mounted
 25 on a sleeve 26 which is mounted for rotation on the main shaft 4 which carries the right hand group of setting disks, and the said shaft and sleeve are adapted to be coupled by means of a clutch member or tooth 27.
 30 Apart from this, gear wheels 29, 30, and 31, are provided intermediate the shaft 4 and sleeve 26, which can be thrown into or out of operation and permit the shaft and sleeve to be rotated either in opposite directions or
 35 in the same direction.

If it is desired, that the left hand group of setting disks 5 be rotated in the same direction as the right hand group, a button 36 carrying the coupling member 27 is shifted
 40 in the direction of the arrow shown in Fig. 1. Thereby the sleeve 26 is connected with the main shaft 4, and the aforesaid gearing thrown out of operation, so that upon rotation of the machine crank 1 the said sleeve
 45 takes part in the rotary movement of the right hand group of setting disks mounted on the main shaft. If on the other hand it is desired that the left hand group of setting disks be rotated in a direction opposite to that of the right hand group of setting disks, the clutch mechanism 27, 36 must be thrown out of operation and the gear wheels 29, 30, 31 into operation. By the said gear wheels the sleeve 26 is connected
 50 with the crank shaft 28 independently of the clutch 27, 36, and in such a way, that upon rotation of the machine crank 1 the left hand group of setting disks is rotated in a direction opposite to that of the rotation of
 55 the right hand group of setting disks, as will clearly be understood from an inspection of the drawing.

As it is necessary to throw the gear wheels 29, 30, 31 out of operation when the clutch
 60 27, 36 is thrown into coupling position, or

vice versa, both mechanisms are preferably connected in such a way, that one of the mechanisms can be thrown into operation only after the other one is or has been thrown into inoperative position. To indicate
 70 what may be done for this purpose, the parts 30 and 27 are shown as connected by a lever 32 having a fulcrum at a point intermediate its ends on a relatively fixed part 33. Therefore, when one of the parts
 75 30 or 27 is thrown into operative position, the other one 27 or 30 is thrown into inoperative position, or vice versa.

I claim:

1. In a calculating machine, the combination with a setting mechanism comprising two groups of setting members, a main shaft having one group of setting members secured thereto, and a sleeve on said main shaft and carrying the other group of setting
 80 members, of operating means for said main shaft, registering mechanism comprising a plurality of registering members adapted to be operated by said setting mechanism, and means to connect said main shaft and said
 85 sleeve with each other at will for rotation in the same or in the opposite direction.

2. In a calculating machine, the combination, with a setting mechanism comprising two independently-revoluble groups of
 90 setting members, and a registering mechanism operable partly by one group and partly by the other; of means for rotating one of said groups; and means for connecting the other group to the first-named group
 100 for simultaneous rotation therewith in either the same or the opposite direction.

3. In a calculating machine, the combination, with a setting mechanism comprising two independently-revoluble groups of setting members arranged in axial alinement, and a registering mechanism operable by said setting mechanism; of means for rotating one of said groups; and means for connecting the other group to the first-named
 110 group for simultaneous rotation therewith in either the same or the opposite direction.

4. In a calculating machine, the combination, with a setting mechanism comprising two independently-revoluble groups of setting members, and a registering mechanism operable partly by one group and partly by the other; of a member rotatable continuously in one direction and having a constant connection with one of said groups
 115 and a reversible connection with the other group, to rotate both groups either in the same direction or in opposite directions.

5. In a calculating machine, the combination, with a setting mechanism comprising two independently-revoluble groups of setting members, and a registering mechanism operable by said setting mechanism; of an operating crank; a driving connection between said crank and one of said groups for
 120 125 130

rotating the latter constantly in one direction; and a reversible driving connection between said crank and the other group, for rotating said other group in either the same direction as or the opposite direction from the first-named group.

6. In a calculating machine, the combination, with a setting mechanism comprising two independently-revoluble groups of setting members, and a registering mechanism operable by said setting mechanism; of an operating crank; a driving connection between said crank and one of said groups for rotating the latter constantly in one direction; means for coupling said groups together for rotation in the same direction; and a reversing connection between said crank and the other group, for rotating said other group in the opposite direction from the first-named group.

7. In a calculating machine, the combination, with a setting mechanism comprising two independently-revoluble groups of setting members, and a registering mechanism operable by said setting mechanism; of an operating crank; a driving connection between said crank and one of said groups for rotating the latter constantly in one direction; means for coupling said groups together for rotation in the same direction; a reversing connection between said crank and the other group, for rotating said other group in the opposite direction from the first-named group; and means for operating said coupling means and said reversing connection alternately.

8. In a calculating machine, the combination, with a setting mechanism comprising two independently-revoluble groups of setting members, and a registering mechanism operable by said setting mechanism; of an operating crank; a driving connection between said crank and one of said groups for rotating the latter constantly in one direction; means for coupling said groups together for rotation in the same direction; a reversing connection between said crank and the other group, for rotating said other group in the opposite direction from the first-named group; and a single member connected with said coupling means and said reversing connection for operating the same alternately.

9. In a calculating machine, the combination, with a setting mechanism comprising two independently-revoluble groups of setting members, and a registering mechanism operable by said setting mechanism; of an operating crank; a driving connection between said crank and one of said groups for rotating the latter constantly in one direc-

tion; means for coupling said groups together for rotation in the same direction; and reversing gearing connecting said crank and said other group, for rotating said other group in the opposite direction from the first-named group, said gearing including a shiftable gear wheel and actuating means therefor.

10. In a calculating machine, the combination, with a setting mechanism comprising two independently-revoluble groups of setting members, and a registering mechanism operable by said setting mechanism; of an operating crank; a driving connection between said crank and one of said groups for rotating the latter constantly in one direction; means for coupling said groups together for rotation in the same direction; reversing gearing connecting said crank and said other group, for rotating said other group in the opposite direction from the first-named group, said gearing including a shiftable gear wheel and actuating means therefor; and means for operating said coupling means and said gear-actuating means alternately.

11. In a calculating machine, the combination, with a setting mechanism comprising two independently-rotatable groups of setting members, and axially-aligned supporting elements whereon said groups are secured; of an operating member; separate driving connections between said operating member and said supporting elements for rotating said groups in opposite directions; and means for coupling said elements together for rotation in the same direction.

12. In a calculating machine, the combination, with a setting mechanism comprising two independently-rotatable groups of setting members, and axially-aligned supporting elements whereon said groups are secured; of an operating member; a gear connection between said operating member and one of said supporting elements for rotating the latter constantly in one direction; a reversing gear connection between said operating member and the other supporting element, for rotating said other element in the opposite direction, said reversing gear connection including a shiftable gear wheel; and means for coupling said elements together for rotation in the same direction.

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

FRANZ TRINKS.

Witnesses:

WILHELM LEHRKE,
KARL MUNDT.