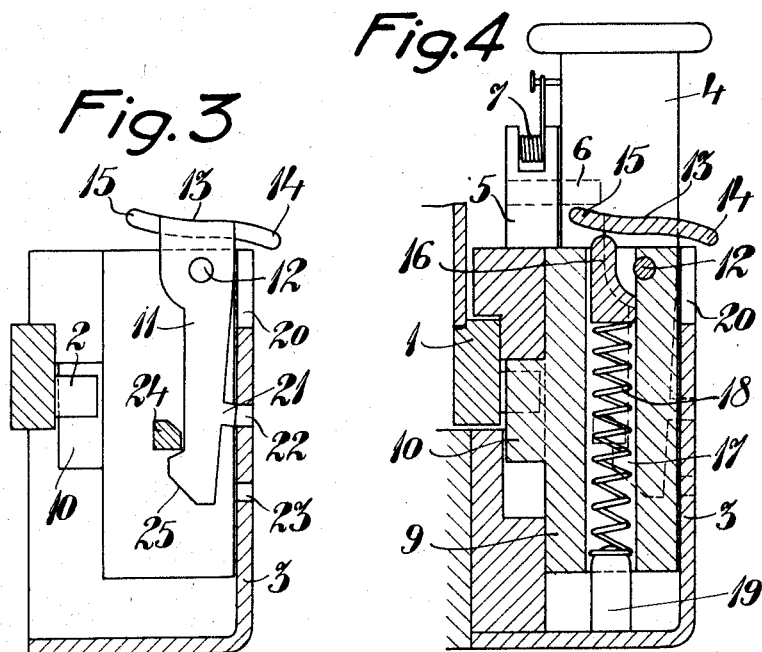
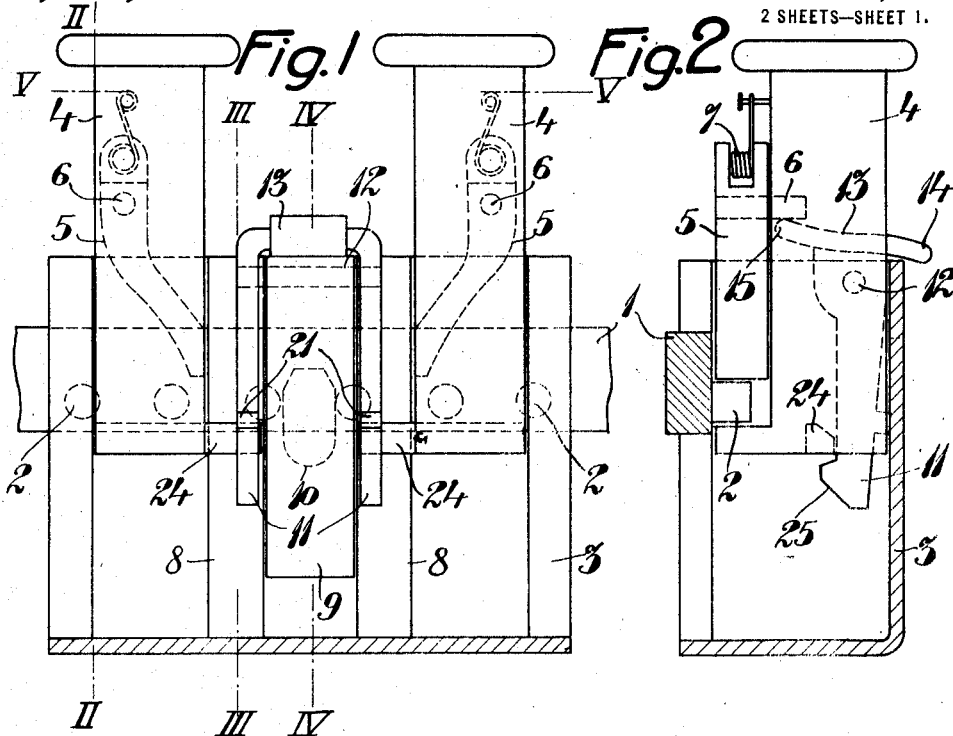


1,385,350.

Patented July 19, 1921.

2 SHEETS—SHEET 1.



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E. KUIKKA.
CALCULATING MACHINE.
APPLICATION FILED NOV. 4, 1919.

1,385,350.

Patented July 19, 1921.

2 SHEETS—SHEET 2.

Fig. 5

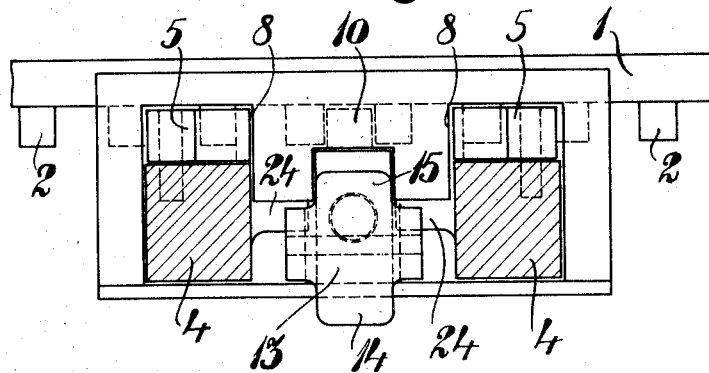
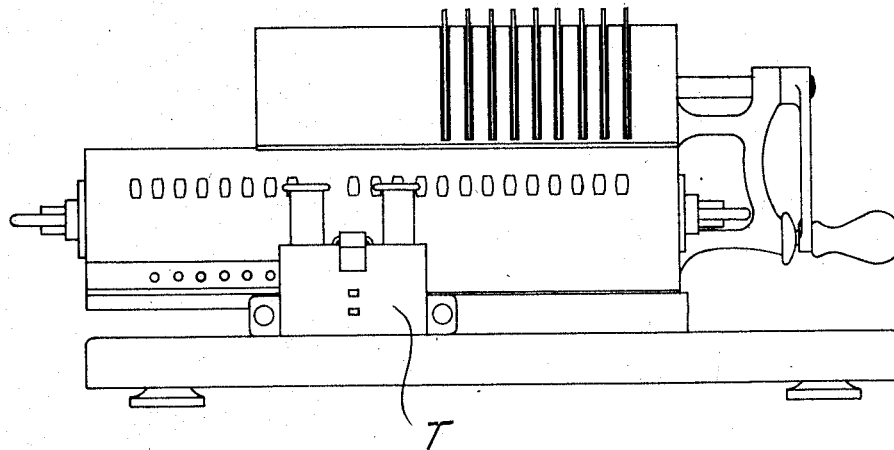


Fig. 6



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UNITED STATES PATENT OFFICE.

EDVARD KUIKKA, OF GOTTENBORG, SWEDEN, ASSIGNOR TO AKTIEBOLAGET ORIGINAL-
ODHNER, OF GOTTENBORG, SWEDEN, A CORPORATION OF SWEDEN.

CALCULATING-MACHINE.

1,385,350.

Specification of Letters Patent.

Patented July 19, 1921.

Application filed November 4, 1919. Serial No. 335,661.

To all whom it may concern:

Be it known that I, EDVARD KUIKKA, a citizen of the Republic of Finland, residing at Gottenborg, Sweden, have invented new and useful Improvements in Calculating-Machines, for which have been filed an application in Sweden, October 24, 1918, by Aktiebolaget Original-Odhner, of Gottenborg, Sweden, of which the following is a specification.

This invention relates to calculating machines and more especially to calculating machines having tabulating mechanism and in which the machine, for multiplication or division with units, tenths, hundreds and so on, is adjusted by moving stepwise a carriage in the one direction or the other.

The devices hitherto constructed for that purpose are imperfect because of being complicated and not capable of stopping the carriage reliably when reaching the position desired. Owing thereto it will happen that the carriage on rapid depression of an operating key is moved two steps instead of one step only, the multiplication or division thereby being erroneous.

Said inconveniences are prevented by my present invention the object of which is the provision of a tabulating mechanism of simple construction and one that will occupy less space than those hitherto constructed and of quite reliable functioning, since the carriage, on each depression of an operating key, is always moved one step only.

To this purpose the tabulating mechanism comprises a series of projections preferably placed on the carriage or any member connected with the same and an escapement pawl adapted to enter between said projections at about right angles to their direction of movement, said pawl being provided with a slide surface coacting with the projections and so formed as to actuate, on the movement of the escapement pawl, one of said projections in such manner that the projection together with the carriage is fed forward.

A preferred embodiment of the invention is illustrated in the accompanying drawings in which—

Figure 1 is a side view of the tabulating mechanism. Figs. 2 to 4 inclusive are vertical sections on lines II—II, III—III and IV—IV respectively in Fig. 1. Fig. 5 is a horizontal section on line V—V in Fig. 1.

Fig. 6 is a front view of a calculating machine provided with a tabulating mechanism constructed according to the invention.

Referring to the drawings, the tabulating mechanism T comprises a feed bar 1 movable in the longitudinal direction and in any convenient manner connected with the carriage of the calculating machine and by the motion of which the machine is adjusted for multiplication or division with units, tenths, hundreds and so on. Placed on one side of the feed bar 1 at equal intervals are pins 2 or similar projections, each of the intervals corresponding to one step of the carriage. Guided in a frame-work 3 provided at the side of the feed bar 1 are two keys 4 adapted to move up and down at right angles to the direction of movement of the bar 1.

Each key 4 is provided with an escapement pawl 5 journaled on a pin 6 fixed to the key, a spring 7 actuating the pawl and tending to keep the lower end of the same in contact with a vertical wall 8 of the frame-work 3. On the depression of the key 4 the end of the pawl enters the space between said wall and a projection 2 of the feed bar 1, the slide surface of the pawl coacting with said projection being so formed that the projection together with the feed bar 1 is moved longitudinally with a speed very little at the beginning but increasing successively and decreasing during the last half of the down-stroke of the key. One of the keys 4 is provided with a pawl 5 effecting the movement of the feed bar 1 in one direction, and the other key 4 has another pawl 5 effecting the movement in opposite direction, as will appear from Fig. 1. The keys are actuated in upward direction by springs (not shown) tending to keep the keys in raised position.

Placed between the keys 4 is a slide 9 movable in parallel to the keys and provided at the side facing the feed bar 1 with a lug 10 the width of which corresponds to the interval between two projections 2 of the feed rail and adapted to enter, in its uppermost position, between the projections, thus locking the feed bar. Attached to each of the sides of slide 9 facing the keys 4 is a pawl 11. The pawls 11 are secured to a common pin 12 journaled in the slide 9 and at the top are interconnected by a plate 13 provided with a fore

projection 14 and a rear projection 15. Bearing against the lower side of the rear projection 15 is a piston 16 or the like guided in a vertical bore 17 in the slide 9 and forced
 5 against the said projection by a spring 18 inserted in the bore 17 and the lower end of which bears upon a projection 19 extending from the bottom of the frame work 3 and entering the bore 17. The fore projection 14 of the plate 13 is adapted to limit
 10 the downward motion of the slide 9 by engaging the bottom of a recess 20 made in the upper edge of the fore wall of frame work 3 (Figs. 3 and 4).

15 At the side facing said fore wall each pawl 11 is provided with a projection 21, and in the wall two apertures 22 and 23 are provided for each pawl 11 corresponding to the projection 21 in the uppermost and
 20 the lowermost position respectively of the slide 9.

Each key 4 has a lateral projection 24 coacting with the adjacent pawl 11, the lower edge of which has a bevel face 25 adapted
 25 to coact with a corresponding bevel face on the upper side of projection 24.

The device described above operates as follows:

The different members assume normally
 30 the positions shown in Fig. 1 in which the keys 4 and the slide 9 are held in their raised positions, the lug 10 catching between two projections 2 thus locking the feed bar 1. The spring 18 keeps the pawls 11 in the
 35 position shown in Fig. 3, the projection 21 being out of engagement with the aperture 22 and the pawls 11 catching under the projections 24. On the depression of a key 4, for instance the right one in Fig. 1, the
 40 escapement pawl 5 of said key moves the adjacent projection 2 to the right, and at the same time the projection 24 moves the corresponding pawl 11 and the slide 9 contrary to the action of spring 18. Thereby
 45 the lug 10 is released from engagement with the projections 2. Owing to the form of the slide surface of the pawl 5, the feed rail 1 is started softly and, consequently, has no tendency to move intermittently. At
 50 about half of the down-stroke of the key 4 the projection 14 of plate 13 strikes the bottom of the recess 20, further downward motion of the slide 9 thus being hindered. At the same time the projection 21 of the
 55 pawl 11 arrives at the aperture 23. On further downward movement of key 4 the projection 14 causes the pawl 11 to swing to the side against the action of spring 18, the projection 21 entering the aperture 23.
 60 Owing thereto the projection 24 can move past the pawl 11 allowing the key 4 to be moved to its lowermost position. The pawl 11 being released from projection 24, both
 35 pawls 11 are swung back by the action of spring 18, the projection 21 thus leaving the

aperture 23 and the compressed spring 18 moving the pawls 11 and the slide 9 upward. The lug 10 then strikes the lower side of the projection 2 previously situated to the
 70 left of the lug, and as soon as the key 4 has reached its lowermost position and the bar 1 thereby has moved one step to the right, the lug 10 enters between said projection and the next one thus again locking
 75 the feed bar 1. When releasing the key 4, it is returned to its uppermost position by the spring actuating the same. Then the side of the pawl 5 facing the wall 8 slides on the projection 2 situated to the left of the
 80 pawl, the latter being swung as far as is needed against the action of spring 7 so as to be capable of moving upward. During the upward motion of the key 4 the bevel face of projection 24 strikes the bevel
 85 face 25 of pawl 11 and, the spring raising the key 4 being more powerful than spring 18, the pawls 11 will be swung, so as to allow the projection 24 to pass the end of the pawl 11, since the projection 21 is now
 90 situated in front of the aperture 22. The spring 7 tends, it is true, to swing the pawl 5 during the upward motion of the key 4, so as to move the bar 1 backward. This movement is, however, prevented by the bar
 95 1 being locked by the lug 10.

The lug 10 of slide 9 keeping the rail 1 locked between the movements thereof effected by the pawl 5, it is evident that no undesired movement of the bar and the carriage can take place.
 100

By depressing the slide 9 directly by hand the carriage will be released so that it can be moved any number of steps in either direction.

Having now particularly described and ascertained the nature of said invention and in what manner the same is to be performed, I declare that what I claim is:—
 105

1. In a calculating machine having a movable carriage, a tabulating device comprising
 110 projections arranged at intervals and connected with said carriage, an escapement pawl movable at right angles to the direction of movement of the carriage and having a sliding surface adapted to actuate said projections to move the carriage, means normally
 115 locking the projections operated by the actuating movement of the pawl to release the projections, and means whereby the locking means is returned to normal position in advance of the return movement of the pawl.
 120

2. In a calculating machine having a movable carriage, a tabulating device comprising a feed bar connected with the carriage and having a plurality of projections arranged at
 125 intervals, an escapement pawl movable at right angles to the direction of movement of the feed bar and having a sliding surface adapted to actuate said projections to effect the motion of the carriage, a slide normally
 130

locking the projections against movement and operable by the pawl in its actuating movement to release the projections and means to return the slide to locking positions in advance of the return movement of the pawl.

3. In a calculating machine having a movable carriage, a tabulating device comprising a feed bar connected with the carriage and having a plurality of projections arranged at intervals, a key movable at right angles to the direction of movement of the bar, an escapement pawl journaled on the key and having a slide surface adapted to engage said projections on depressing the key, a slide having a lug normally engaging said projections to lock the bar against movement and movable out of normal position by the pawl on the depression of the key, and means to automatically return the slide to normal position independently of and in advance of the return movement of the key.

4. In a calculating machine having a movable carriage, a tabulating device comprising a feed bar connected with the carriage and having a plurality of projections arranged at intervals, a key movable at right angles to the direction of movement of the bar, an escapement pawl journaled on the key and having a slide surface adapted to engage said projections on depressing the key, a slide having a lug to engage said projections and lock the bar against movement, a spring for normally holding the slide in locking position, a projection on the key adapted to engage the slide whereby the latter is retracted during the depression of the key and means to limit the movement of the slide and automatically release the slide from the key during the depression of the latter.

5. In a calculating machine, the combination of a casing, a carriage movable in said casing, a row of projections on said carriage, and a member in said casing movable at right angles to the direction of movement of the

carriage, said member having a cam surface to engage with said projections, for the purpose described.

6. In a calculating machine, the combination of a casing, a carriage movable in said casing, a row of projections on said carriage, a key on said casing movable at right angles to the direction of movement of the carriage, and a member carried by said key and having a cam surface to engage with said projections, substantially as described.

7. In a calculating machine, the combination of a casing, a carriage movable in said casing, a row of projections on said carriage, a key on said casing, movable at right angles to the direction of movement of the carriage, a member pivoted to said key and having a cam surface to engage with said projections, and means for preventing said member from rotation during the depression of the key while permitting rotation of said member in the restoration of the key, for the purpose described.

8. In a calculating machine, the combination of a casing, a carriage movable horizontally in said casing, a horizontal row of projections on said carriage, a key movable up and down on said casing, a member on said key having a cam surface to engage with the said projections upon the depression of the key, and means to lock the carriage against movement, said means being arranged to be released by the key when depressed.

9. In a calculating machine, the combination of a casing, a carriage movable horizontally in said casing, a horizontal row of projections on said carriage, and two keys movable up and down on said casing, members on said keys having oppositely positioned cam surfaces to engage with said projections.

In testimony whereof I have signed my name.

EDVARD KUIKKA.