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PATENT



SPECIFICATION

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Application Date (in the United Kingdom), Dec. 31, 1917. No. 19,327/17.

Complete Accepted, June 13, 1918.

COMPLETE SPECIFICATION.

Improvement in Adding Machines.

I, OSCAR ADOLF KRISTIAN PRINTZ, of Södra Vägen 16, Kalmar, Sweden, Mechanical Engineer, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

5 This invention relates to adding machines of the kind, in which the actuating members for the indicating wheels consist of slidably mounted toothed bars provided with retracting springs and having locking means whereby they may be maintained in set position for the purpose of permitting observation of the number transferred, means being further provided for releasing the actuating
10 members from engagement with the indicating wheels.

One object of the invention is to provide simple and reliable releasing means of the said kind by means of which the actuating members, after having been set, will be automatically brought out of contact with the indicating wheels without being removed from the set position, wherein they are maintained by
15 the locking devices. This constitutes a simple means for permitting the transposition of the figures of any number from the left, in the same order in which the figures are read, without interfering with the possibility of observing the number transferred.

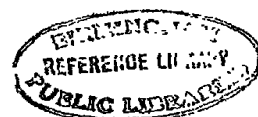
Another object of the invention is so to dispose said releasing means with
20 relation to said locking means that said first-mentioned means will prevent the operation of the indicating wheels when the locking means are out of operative position.

According to one feature of this invention the said releasing means consist of pivotally mounted levers or arms bearing against the lower toothed surface
25 of the actuating bars, the arrangement being further such that any actuating bar, after having been set, will be moved back for a certain distance by the retracting spring before being locked by the locking device, and in this movement one tooth of the bar will ride upon the top of the corresponding releasing lever thereby lifting the bar out of contact with the indicating wheel.

In the accompanying drawing which illustrates one embodiment of the invention, Fig. 1 is a longitudinal section through the machine with the actuating
30 bars in elevated position. Fig. 2 is a longitudinal section of the machine showing the locking levers in elevated position and the actuating bars in their original position. Figs. 3, 4 and 5 show detailed views on a larger scale of parts of the releasing mechanism. Fig. 6 is a plan view of the machine.

35 As shown in the drawing, the adding machine involves a series of indicating wheels 7 pivotally mounted side by side on a common shaft 70 and having

[Price 6d.]



means (not shown) for the transfer of units to tens and so on. The indicating wheels are provided with teeth on their circumference, said teeth being marked in numerical order with the numbers 0 to 9. The actuating members for the indicating wheels consist of a series of slidably mounted bars 2 corresponding in number to the number of the indicating wheels and having teeth formed in their lower surface for engagement with the teeth of the indicating wheels. Formed in the upper surface of the bars are teeth marked in order with the numbers 0 to 9, said teeth permitting the displacement of the bars by means of a suitable pointed instrument, such as, for instance, a pencil 1 (Fig. 1) or the like. The rigid frame surrounding the bars is in well known manner marked with numbers arranged in the opposite order to that of the numbers of the bars. The bars 2 are each provided with a retracting spring 12 adapted to return the displaced bar to the original position. Further, there is provided a spring operated locking device 5, 6 for the indicating wheels, a transverse bar 4 carried by side arms pivoted on the shaft 3 being provided for the purpose of operating said locking device, said bar 4 being in turn operated by the pencil 1. Part 6 is also a transverse bar carried by arms 5 at the sides of the housing, said arms sliding at their one end on two pins 16 and further sliding on pins 50 near the narrower end of the arms 5. The bar 6 is held out of engagement with the indicating wheels by a spring 18 (Fig. 2) tending to keep the arms 5 in contact with the side arms of the bar 4. To lock the bars 2 after each setting operation a locking lever 10 is provided for each of said bars adapted to cooperate with the teeth in the upper side of the bar. 11 indicates the releasing device by means of which the bars 2 may be brought out of contact with the indicating wheels without releasing the locking levers 10.

As shown in Figs. 1 and 2, the bars 2 are entirely symmetrical with as many teeth in the lower side as in the upper side, which permits the provision of numbers also in the lower teeth, the upper and lower surface of the bars being, preferably, printed in different colors so that different combinations of colors may be obtained on the upper side of the bars by inverting some of the bars, the finding of any desired bar in making additions of numbers of different characters being thus considerably facilitated. The teeth of the actuating bars 2 are, preferably, somewhat deeper than those of the indicating wheels.

The detailed construction of the machine will sufficiently appear from the following description of the operation thereof. When the transposition of a figure is to take place, the pencil 1 is first engaged in the tooth of the desired bar 2 which is marked with the figure in question, and the bar is then displaced longitudinally towards the indicating wheels. Towards the end of the movement of any bar 2, the pencil 1 strikes the transverse bar 4 swinging the same backwards, the side arms of the bar 4 in this movement acting on the arms 5 so as to displace the same until the bar 6 engages with the indicating wheels and locks the same against pawls 8 situated behind the indicating wheels, and engaging therewith under the influence of springs 9. When the bar 4, and, consequently, also the pencil 1 thus come to rest, the operated indicating wheel, the actuating bar and the corresponding locking lever 10 as well as the releasing device 11 will occupy the positions shown in Fig. 3. The figure is now transferred to the indicating wheel. As the pencil is then removed from the bar, the spring 12 (Fig. 1) tends to retract the bar 2 to its original position. Only a slight movement of the bar, however, takes place viz: until the tooth 13 (Fig. 3) of the bar adjacent to the locking lever 10 strikes said lever thereby stopping the bar in set portion. During said slight movement of the bar, the tooth thereof engaging the top of the device 11 rides upon said top thereby lifting the bar out of engagement with the indicating wheel. While the bar is thus lifted, the device 11 is prevented from turning about the journal 14 by this that the lower end of said device 11 bears against a vertically slidable member 17 (Figs. 1 and 3) which is maintained in its uppermost position under the

action of a spring 15. The movement of the sliding member 17 is guided by pins 16. During this returning movement of the bar 2, the locking device 5 is retracted by the spring 18 (Fig. 2) so as to come out of engagement with the indicating wheels. After having been stopped by the control locking lever 10, the bar 2 will occupy the position shown in Fig. 1, in which the indicating wheels are free to move each other for the transfer of units to tens and so on. After the figure transferred has been observed by the operator, the control locking levers 10 are lifted by depressing an exterior arm 20 (Figs. 5 and 6) attached to a journal 19 until said arm strikes a stop 21. By this movement, cam disks 22 attached to the said journal 19 and situated beneath the control locking levers 10 are turned into the position shown in Fig. 2. At the first portion of the said movement of the cam disks 22, a slide 24 only is displaced by the cam disks. Said slide is at its rear end formed with bent projections 25 (Figs. 1 and 4) each of which engages with one of the sliding members 17 to move the same downwardly during the said displacement of the slide 24. After the sliding members 17 during the movement of the cam disks 22 have come below the lower edge of the releasing devices 11 (Fig. 1), the cam disks 22 will also come in contact with the control locking levers 10 and lift the same out of contact with the actuating bars 2. As soon as the bars 2 are free to move, the displaced bars will be brought back into their original position under the action of the springs 12, and in this movement the releasing devices 11 are free to turn so as not to prevent the returning movement of the bars. After the latter are again at rest in their original position, the devices 11 will be moved into the position shown in Fig. 2 under the action of the coiled spring 26 (Figs. 3 and 4), a spring 27 preventing the bars 2 from being lifted. As soon as the lever arm 20 is released, the slide 24 is brought back to its original position by the spring 28, and operates the cam disks 22 until the lever arm 20 strikes the stop 29 (Fig. 5). The cam disks 22 and the slide 24 are thus moved into the position shown in Fig. 1. The control locking levers 10 will at the same time return to the position shown in Fig. 1 under the action of the springs 30, and the sliding members 17 will under the influence of the spring 15 be moved upward, until the upper surface thereof bears against the lower side of the levers 11. At the subsequent displacement of an actuating bar, the tooth in the under side of the bar immediately in front of the upper projecting portion of the releasing device 11 will engage with said projection and turn the device 11 so as to bring the lower end thereof out of contact with the sliding member 17, as shown in Fig. 3, thereby permitting the sliding member 17 to be moved by the spring 15 into the position shown in Fig. 3. The releasing device will under the action of the spring 26 be moved into the position shown in Fig. 3 as soon as the bar 2 reaches the end of its movement, whereupon the lifting of the bar will take place in the manner already described. With the control levers 10 after operation of the part 20 in raised position, it is impossible to displace any actuating bar towards the indicating wheels, as this movement is prevented by the device 11 the lower end of which striking the upstanding portion 31 of the slide 24 (Fig. 2) at any attempt to displace the bars, and cannot pass the said portion 31 until after the slide 24 in its returning movement has brought the cam disks 22 into a position in which the control locking levers are brought back to their operative position under the action of the retracting springs 30.

It is, of course, immaterial whether a common slide 24 is provided for all of the actuating bars, or there is a separate slide for each of said bars.

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. An adding machine in which the actuating means for the indicating wheels consists of toothed bars which are locked in set position and automatically returned to their original position upon the release of the locking means, characterised in the provision of means for automatically releasing the said

actuating bars from engagement with the indicating wheels after each setting operation without removing the actuating bars from the set position wherein they are maintained by the locking means.

2. An adding machine as claimed in Claim 1 in which the actuating bars are free to be moved back for a certain distance after each setting operation before being locked in set position and in which the said releasing means consist of pivotally mounted levers engaging the toothed under side of the actuating bars for lifting the latter out of contact with the indicating wheels, as the bars are thus moved back.

3. In an adding machine as claimed in Claims 1 and 2 the provision of slidable means for maintaining the releasing levers (11) in operative position or for releasing the same, the said slides being adapted to be moved by the same members used for operating the locking devices of the actuating bars, the arrangement being such that the slides will release the levers (11) immediately before the locking devices are released so that the levers (11) may not prevent the retracting movement of the actuating bars.

4. In an adding machine as claimed in Claim 3, the characteristic feature that the said slides will return the levers (11) into operative position at the subsequent operation of the actuating bars.

5. In an adding machine as claimed in Claims 3 and 4 in which a slide (24) forming part of the operating means of the locking devices for the actuating bars will maintain the levers (11) in a position in which they will prevent the operation of the actuating bars while the said locking devices are out of operative position.

Dated this 31st day of December, 1917.

CRUIKSHANK & FAIRWEATHER, LIMITED,

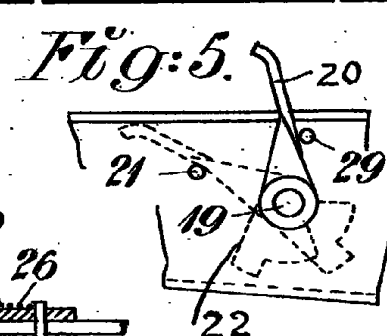
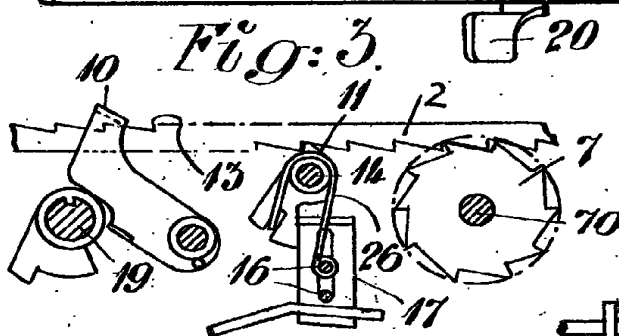
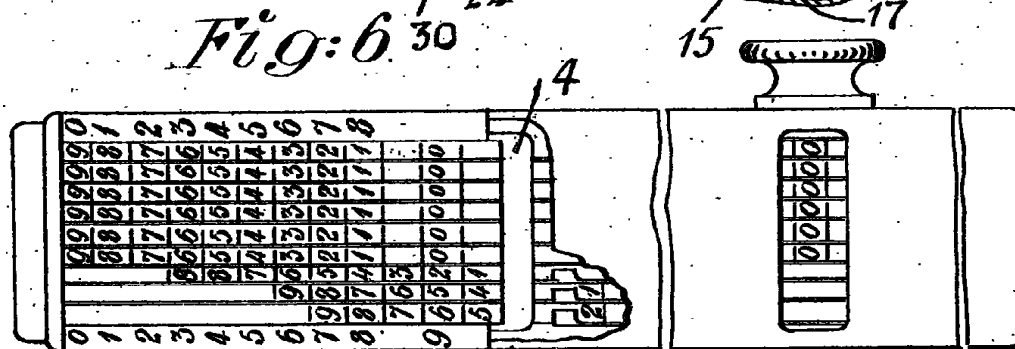
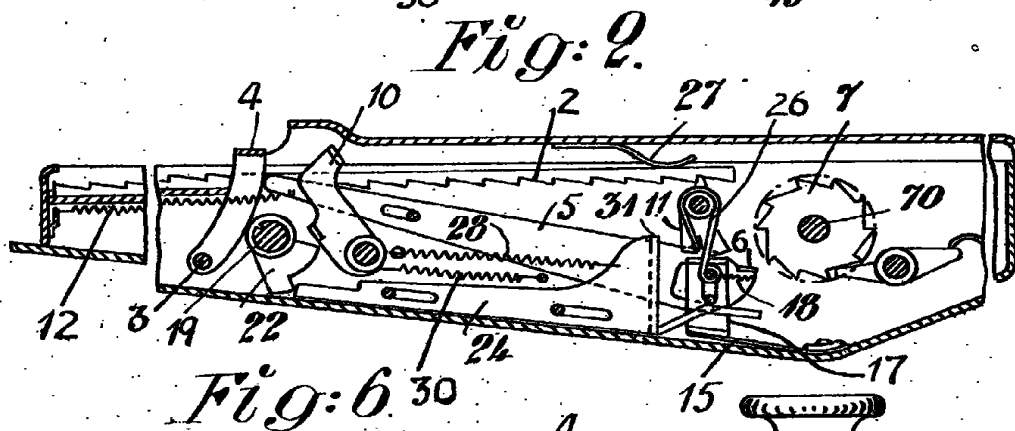
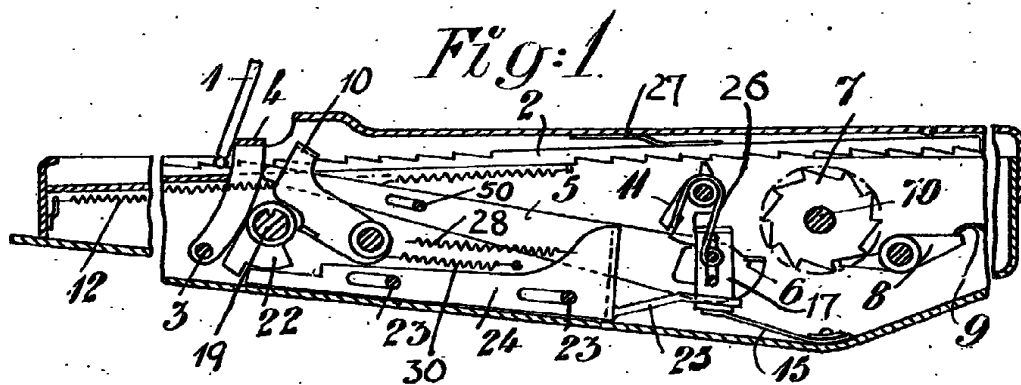
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[This Drawing is a reproduction of the Original on a reduced scale.]