Nov. 1, 1932. O. J. SUNDSTRAND 1,885,960

COMPUTING MACHINE

Filed June 21, 1929

Fig. 1.

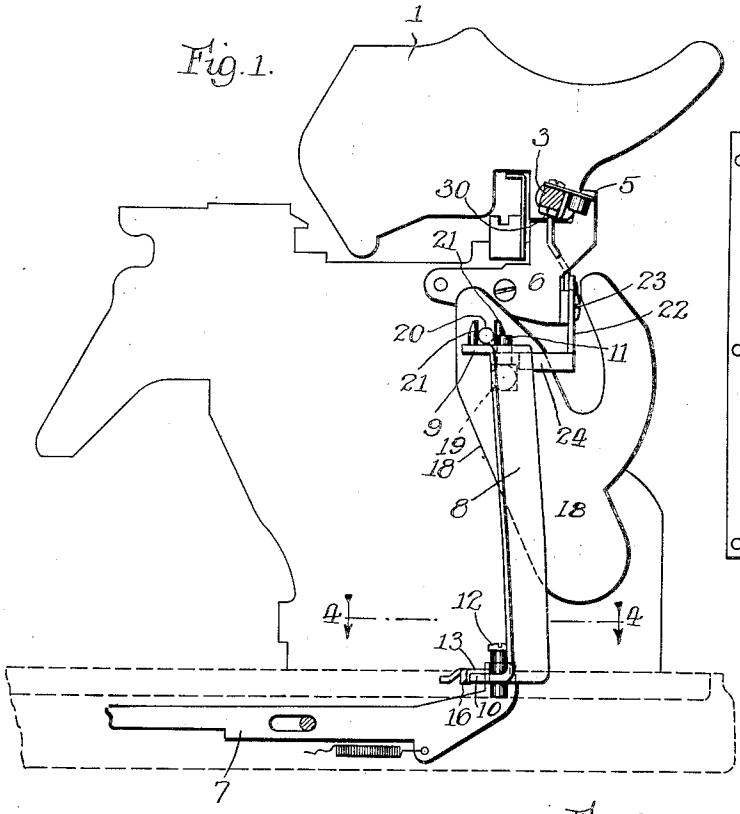


Fig. 2.

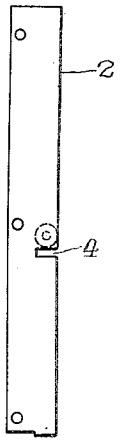


Fig. 3.

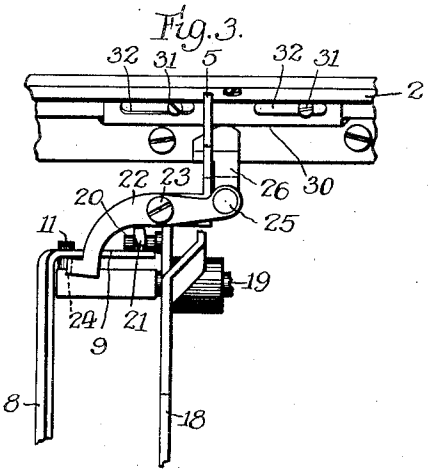


Fig. 4.

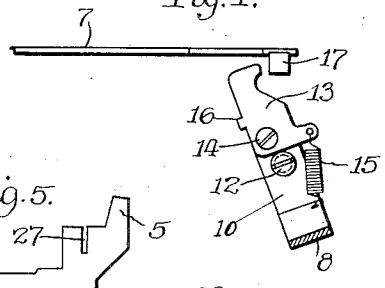


Fig. 5.

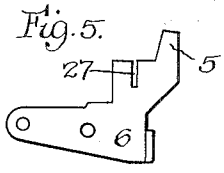
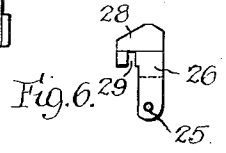


Fig. 6.



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UNITED STATES PATENT OFFICE

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COMPUTING MACHINE

Application filed June 21, 1929. Serial No. 372,646.

This invention relates to adding and/or subtracting machines and has particular reference to means for determining which of a plurality of counters shall be used and to means for determining whether addition or subtraction shall occur.

The object of the present invention is to provide means of the character stated which shall be actuated in the adjustment of the paper carriage to the desired one of a plurality of positions.

In the accompanying drawing,

Figure 1 is a fragmental right-hand view of a machine embodying the features of my invention.

Fig. 2 is a plan view of a plate attached to the paper carriage and forming a part of the means for holding the paper carriage in adjusted position.

Fig. 3 is a fragmental rear view of the machine.

Fig. 4 is a section on line 4—4 of Fig. 1.

Fig. 5 is a detail view of a plate forming a part of the machine frame.

Fig. 6 is a detail view of a plunger comprised in the mechanism.

While the invention may be embodied in machines of various types and makes, it is herein shown as incorporated in a machine of the Sundstrand type, as, for example, the duplex or two-counter machine shown in my application Serial No. 720,187, filed June 16, 1924, (now Patent No. 1,724,231, dated August 13, 1929), or the adding and subtracting machine shown in my application Serial No. 670,665, filed October 25, 1923 (which corresponds to British Patent No. 223,866). In the case of the duplex machine the present invention would serve to determine which of the two counters would be in use, whereas when embodied in an adding and subtracting machine the invention would serve to determine whether a positive or negative operation would occur in the accumulation of items.

The paper carriage is indicated at 1. It may be locked in either of two positions to which it is manually adjusted by any preferred locking means, as, for example, a plate 2 fixed to a rod 3 which is journaled in the paper carriage. In the rear edge of the plate 2 is a notch 4 for the reception of a lug 5 on a plate 6 which is secured in the framework of the machine. When the plate 2 is in engagement with the lug 5 (as shown in Fig. 1), the carriage is held against lateral movement. When it is desirable to adjust the carriage so that printing shall occur in a different column the plate 2 may be tilted out of engagement with the lug 5, whereupon the carriage may be slid to the left until the lug 5 registers with a space between the right-hand end of the plate 2 and the right-hand end wall of the paper carriage. Said space is the equivalent of the notch 4.

The accumulating mechanism is not shown in the drawing. If said mechanism comprises a plurality of counters, the selection of the counters may be effected by any preferred means, as, for example, the mechanism shown in my application Serial No. 720,187, said mechanism comprising a link 7 arranged for movement back and forth longitudinally of the machine. If the accumulating mechanism is adapted for direct subtraction, it may be adjusted for addition or substraction by means of a member such as the link 7, as fully explained in my application Serial No. 670,665. The means herein shown for moving said link comprises a member 8 in the nature of a lever. The member 8 comprises an upper horizontal portion 9 and a lower horizontal portion 10 which are pivoted at the points 11 and 12, respectively, to swing on a vertical axis. The inner end of the portion 10 is preferably made yieldable, as indicated in Fig. 4, where it will be seen that the member 13 is pivoted to the lower portion 10 at 14 and is yieldingly held in normal position by means of a spring 15, the action of said spring being restrained through engagement of a lug 16 on the member 13 with the edge of the lever portion 10.

On the link 7 is a lug 17 for engagement by the inner end of the member 13 when the member 8 is swung on the axis of the pivots 11 and 12. The member 8 is swung by means including, in this instance, a lever 18 pivoted at 19, said lever having a pin 20 that lies between a pair of projections 21 on the

lever portion 9. The lever 18 is swung in every cycle of operations of the machine, as fully disclosed in the before-mentioned applications. The operating end of the arm 10 is made yieldable, as described, in order that the extent of movement of said arm need not correspond precisely to the extent of movement of the link 7.

The member 8 is arranged for vertical movement into and out of position where the inner end of the member 13 can engage the lug 17. In the drawing, the member 8 is shown elevated into such position that the member 13 can engage the lug 17. As shown in Figs. 1 and 3, the pivots 11 and 12 are sufficiently long to allow for such vertical movement of the member 8 and the projections 21 extend sufficiently above the lever portion 9 to engage the pin 20 in either the upper or lower position of the member 8.

The means for raising the member 8 into operative position comprises a lever 22 which is pivoted in the framework of the machine at 23. One arm of the lever 22 has a lug 24 which underlies the lever portion 9. The other arm of the lever 22 is pivoted at 25 to a plunger 26 which is guided by means of the plate 6 for vertical movement. As shown in Fig. 5, the plate 6 has a slot 27 therein to receive a portion 28 of the plunger 26. Said plunger in turn is slotted at 29 to fit over the plate 6. The upper end of the plunger 26 is adapted for engagement by a cam mounted on the paper carriage, said cam in this instance being attached to the pivot shaft 3. In the form herein shown, the cam consists of an angular piece 30 of sheet metal adjustably secured to the pivot shaft 3 by means of screws 31 extending through elongated openings 32 in the piece 30.

When the paper carriage 1 occupies one of its operative positions, the cam 30 is out of engagement with the plunger 26, gravity then serving to hold the plunger elevated and the member 8 in its lowermost position wherein the inner end of the member 13 is below the horizontal plane of the lug 17. The oscillations of the member 8 as the machine is operated therefore have no effect upon the member 7. When, however, the carriage 1 is shifted to another operative position wherein the cam 30 holds the plunger 26 depressed, the member 8 is raised so as to bring the inner end of the member 13 into the horizontal plane of the lug 17. It will be seen that when so raised the next oscillation of the member 8 will cause rearward movement of the link 7 whereby the accumulating mechanism is adjusted for use of another counter, or for registration of items in a manner opposite to that previously employed, as, for example, subtraction in place of addition.

I claim as my invention:

1. In a calculating machine of the character described, the combination of a laterally movable paper carriage, a controlling member operable as an incident to cycling of the machine, a lever for moving said member, means for automatically oscillating said lever in every cycle of operations of the machine, said lever being translatable into and out of position to engage said member, and means for thus moving said lever comprising a lever pivoted in the framework of the machine and engaging the first-mentioned lever, a plunger connected to the second lever, and a cam located on the paper carriage in position to engage said plunger when the paper carriage occupies one of its operative positions.

2. In a calculating machine of the character described, the combination of a laterally movable paper carriage, a shiftable control member, a lever automatically oscillated in every cycle of operation of the machine, means effective to provide an operative connection between said control member and said lever including a lever mounted for sliding movement in a vertical plane and pivotal movement in a plane angularly disposed thereto, said second mentioned lever having a permanent operating connection with said first mentioned lever, and being adapted to coact with said control member in one vertical position and to operate idly in a second vertical position, and means actuated as an incident to the lateral movement of the paper carriage to move said second mentioned lever vertically into position to coact with said control member.

3. In a calculating machine of the character described, the combination of a laterally movable paper carriage, a shiftable control member, a lever automatically oscillated in every cycle of operation of the machine, means effective to operatively connect said control member and said lever including a second lever having spaced arms rigidly connected for translating and pivotal movement, one of said arms being pivotally and slidably connected to said first mentioned lever, the second arm being provided with an abutment effective to coact with said control member in one position of said second lever, and to pivot idly in another position, and cam means on the paper carriage to move said second lever to render the second arm thereof effective.

In testimony whereof, I have hereunto affixed my signature.

OSCAR J. SUNDSTRAND.