W. H. PIKE, Jr.

ATTACHMENT FOR ADDING AND RECORDING MACHINES.

APPLICATION FILED MAY 24, 1906.

1,050,845.

Patented Jan. 21, 1913.

4 SHEETS—SHEET 1.

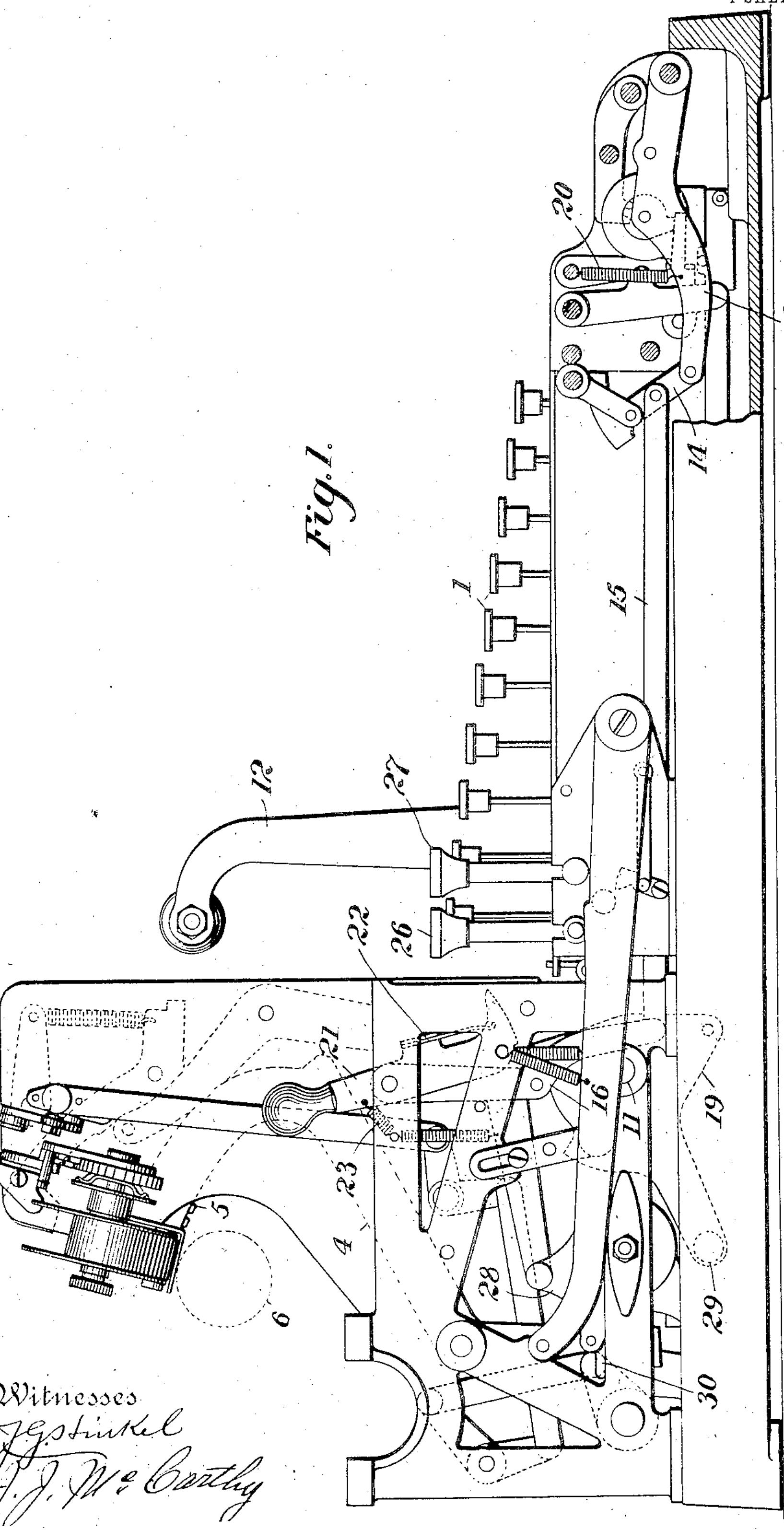

Fig. 1.

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4 SHEETS—SHEET 2.

Fig. 2.

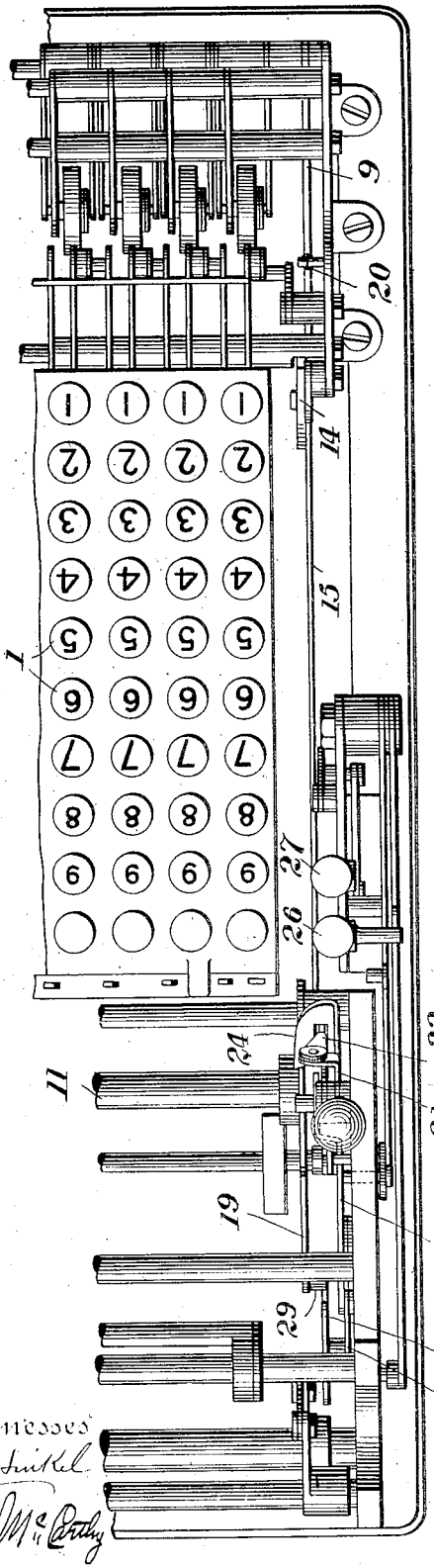
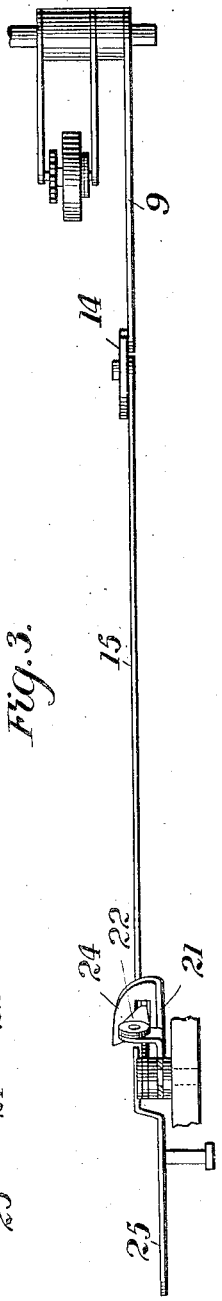


Fig. 3.



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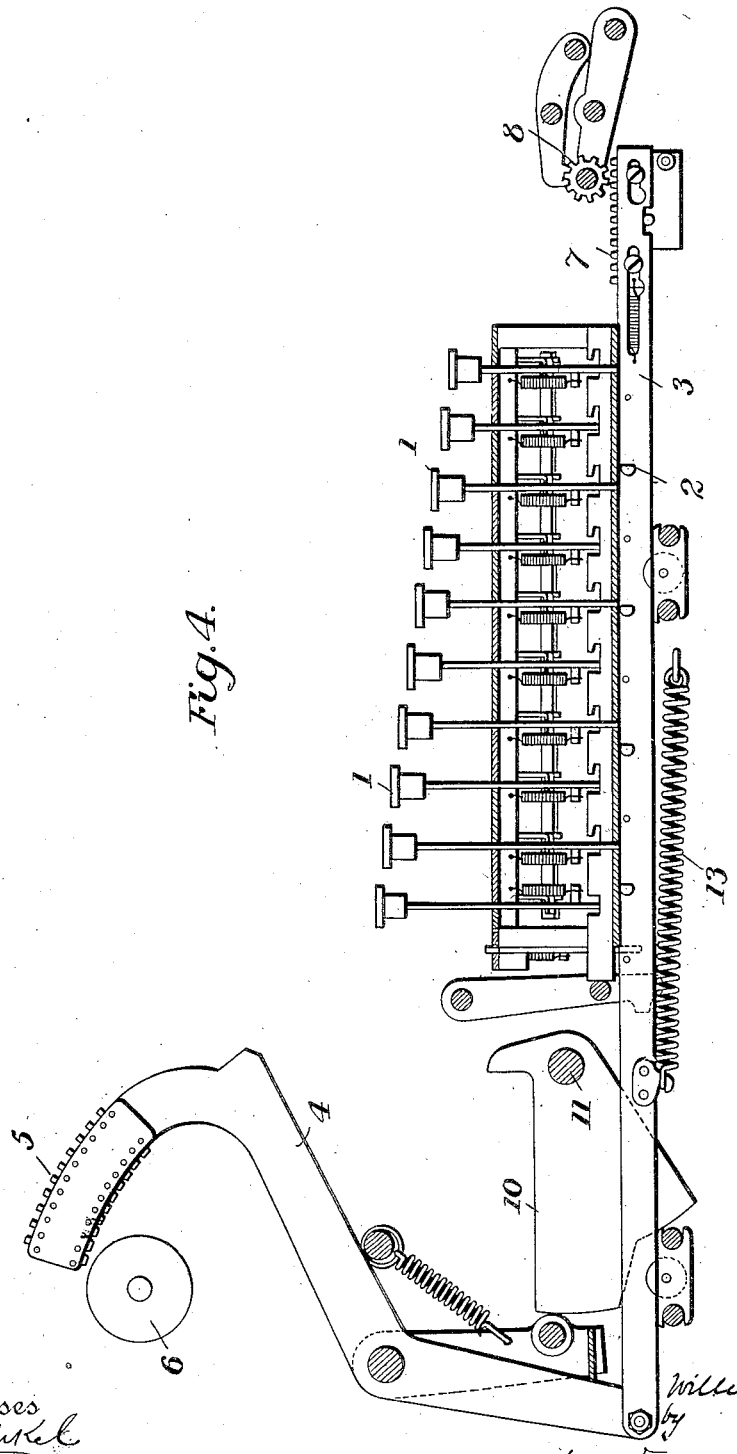
4 SHEETS—SHEET 3.

Fig. 4.



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4 SHEETS—SHEET 4.

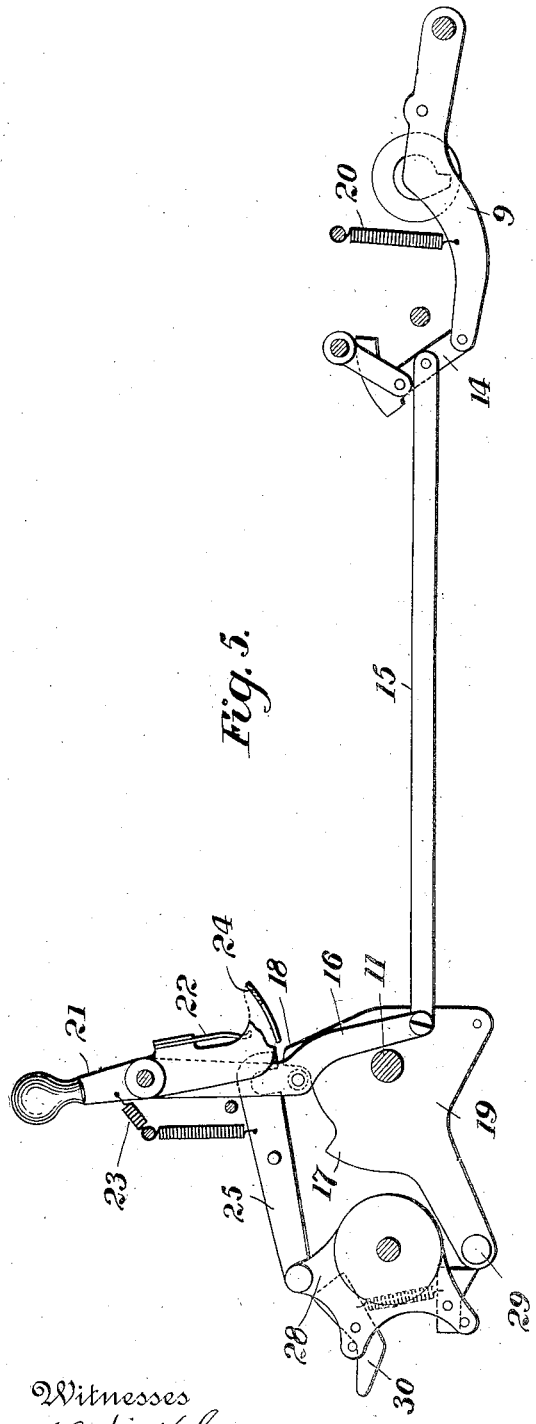

Fig. 5.

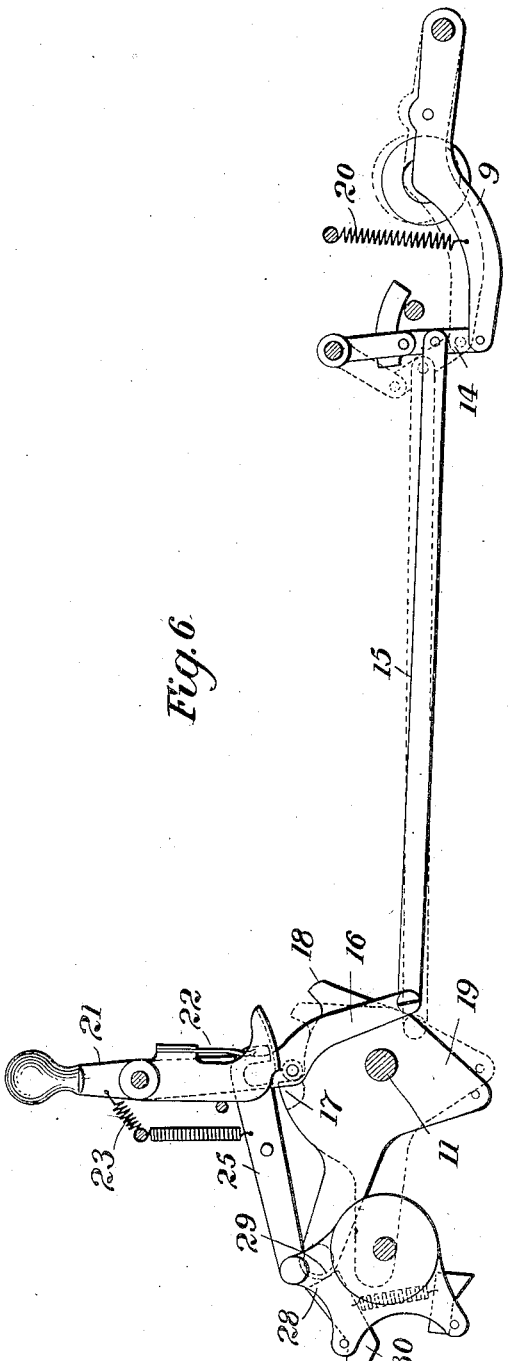

Fig. 6.

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UNITED STATES PATENT OFFICE.

WILLIAM H. PIKE, JR., OF SOUTH ORANGE, NEW JERSEY, ASSIGNOR, BY MESNE ASSIGNMENTS, TO BURROUGHS ADDING MACHINE COMPANY, OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN.

ATTACHMENT FOR ADDING AND RECORDING MACHINES.

1,050,845. Specification of Letters Patent. Patented Jan. 21, 1913.

Application filed May 24, 1906. Serial No. 318,511.

To all whom it may concern:

Be it known that I, WILLIAM H. PIKE, JR., a citizen of the United States, residing at South Orange, Essex county, State of New Jersey, have invented certain new and useful Improvements in Attachments for Adding and Recording Machines, of which the following is a specification.

The present invention relates to improvements in combined adding and recording machines of that class in which at every actuation of the recording devices, the operating means of the accumulating devices is operated. In the practical use of machines of this character, it is sometimes desirable to use the recording devices for securing a record of a number without accumulating the value of said number on the accumulating devices.

To provide means by which this may be accomplished is the particular purpose of the present invention.

The invention has for its object additional purposes which will be evident from the following description.

In the accompanying drawings, the invention is shown as embodied in an adding and recording machine of the type or character illustrated and described in Patent No. 763,692, dated June 28, 1904; but it will be evident that the invention is not limited to use with a machine of the particular style illustrated.

In the drawings;—Figure 1 is a side elevation of an adding and recording machine having the present invention applied thereto; Fig. 2 is a plan view of a portion of the machine, several parts thereof being removed as they are not necessary to an understanding of the present invention; Fig. 3 is a detail plan view of one member of the accumulating devices; Fig. 4 is a vertical longitudinal section through the machine; Figs. 5 and 6 are detail views of the attachment, illustrating the operation of the invention.

Referring to the drawings, the machine is provided with a series of rows of numeral keys 1, the stems of the keys of each row being adapted to coöperate with stops 2 on a strip 3, which is connected at one end to a sector 4 carrying a plurality of type 5 adapted to be moved, by the reciprocation of said bar 3, over a platen 6. At its forward end, each of the strips 3 is provided with a rack 7 adapted to actuate a pinion 8 of the accumulating devices, said pinions 8 being mounted in a swinging frame 9 by which they can be moved to and from position where they will engage the racks 7. The strips and their connected type-carrying sectors are moved in one direction by the action of a cam plate 10 on a power shaft 11, which, in the particular machine illustrated, is operated from a crank or handle 12; and with each strip is connected a spring 13 that acts to move said strip in a direction opposite that in which it is moved by the cam 10.

The swinging frame 9 carrying the pinions and indicating wheels of the accumulating devices is connected with one member of a toggle 14, which is connected by a link 15 with a lever 16, suitably fulcrumed on the frame of the machine, and having a laterally projecting pin adapted to be engaged by two ears or shoulders 17, 18, on a cam plate 19 mounted on the main shaft 11. At each actuation of said main shaft, the cam 10 will be moved to release the sectors 4 and the lower ends of the latter, under the influence of the springs 13 will move forwardly, the extent of movement of each strip 3 and sector 4 being determined by the particular key 1, associated with said strip, which is depressed. At the termination of such forward movements of the strips 3, the shoulder or ear 17 of the cam plate 19 will actuate the lever 16, and through the link 15 and toggle 14 move the swinging frame 9 to cause the pinions 8 to engage with the racks 7. During the return movement of the main shaft 11, the strips 3 will be moved rearwardly by the action of the cam plate 10, the pinions 8 will be turned by the racks to an extent corresponding to the previous forward movement of the latter, and the number represented by the depressed key or keys 1 will be accumulated, such number having been recorded by the recording devices at the completion of the forward movement of the strips 3. At the completion of this rearward movement of the strips 3, the shoulder 18 will engage the lever 16 and break the toggle when springs 20 will act to raise the swinging frame 9 to lift the pinions 8 from engagement with the racks 7. The operation thus briefly described is believed to be sufficient for the purposes of explaining the present invention, the detailed operation of the

machine illustrated being clearly set forth in the patent hereinbefore referred to.

From the foregoing, it will be seen that at each actuation of the handle 12, in the normal operation of such a machine, the accumulating pinions will be brought into engagement with their operating racks and maintained in such engagement until the completion of the rearward movement of the strips 3.

It is sometimes desirable to use the machine to record a number without accumulating the value thereof. To do this, it is evident that the pinions 8 must not be engaged with the rack 7 during the rearward movement of the strips 3. Various means may be employed for accomplishing this result. As shown, a short hand lever 21 is suitably fulcrumed on the frame-work of the machine, and carries a yielding plate or finger 22, adapted to be moved into the path of the lever 16. Normally a spring 23 holds said lever 21 in the position shown in Figs. 1 and 5, where the finger 22 is held beyond the forward limit of the path of movement of the lever 16. If, however, said lever 21 be moved into the position shown in Fig. 6 and held there, said finger 22 will be engaged by the lever 16 as the latter moves forwardly to straighten the toggle 14 and connect the pinions 8 of the accumulating devices with their operating racks. At the termination of such forward movement of the lever 16, the free end of said spring finger 22 will be deflected from its normal position and the finger placed under such tension that the instant the shoulder 17 is withdrawn from engagement with the lever 16 at the commencement of the rearward movement of the power shaft 11, said finger 22 will force the lever 16 rearwardly instantly opening the toggle 14 and allowing the pinions of the accumulating devices to return to their normal elevated position before any rearward movement of the racks 7. That is, if the upper end of the handle 21 is drawn forwardly and is held in this position during an operation of the main operating handle 12, the number represented by the depressed key or keys 1 will be recorded by the recording devices, but will not be accumulated by the machine. The lever 21 also serves another function. When it is operative, as above described, a laterally projecting lip or foot 24 thereon is beneath the free end of a link 25 which is adapted to be depressed when either the sub-total key 26 or total key 27 is operated. As explained in said patent, when it is desired to take a sub-total, that is to record the total of the amounts or items previously recorded and accumulated by the machine, and at the same time to retain such total on the accumulating devices, the key 26 is depressed prior to operating the handle 12. In thus depressing the key 26, the link 25 is pulled down to engage the stud or pin on the lever 16, and as said link is connected with a plate 28, that is rocked by a stud 29 on the cam plate 19 on the commencement of the movement of the power shaft 11, the toggle 14 is straightened and the pinions 8 of the accumulating devices brought into engagement with their operating racks prior to the beginning of the forward movement of the strips 3, and said pinions are maintained in engagement with said racks until, at the completion of the return movement of the handle 12, the shoulder 18 on cam plate 19 operates the lever 16 to open the toggle 14. During the forward movement of the strips 3 with the parts thus positioned, it will be seen that the pinions 8 of the accumulating devices will be turned in a reverse direction to that in which they have been previously moved, the extent of such movement in the case of each pinion corresponding to the number of steps which such pinion has previously been turned from its normal position. That is, with each pinion cooperates a stop for limiting such reverse movement when the wheel has been returned to its normal or zero position. The movement of each sector 4 will of course correspond directly to the extent of movement of its connected strip 3 and therefore the recording mechanism will indicate the total of the items previously accumulated by the turning of the pinions 8. During the return movement of the strips 3, under the influence of their springs 13, the pinions 8 remaining in engagement with the racks 7, each of said pinions will be restored to the position which it occupied prior to operating the machine with the key 26 depressed and therefore at the termination of such operation the accumulating devices will still indicate the total which has been recorded. Such operation is designated as the taking of a "sub-total." When, however, it is desired to record the total of the items previously recorded and accumulated, and at the same time to restore the indicators of the accumulating devices to zero position, the key 27 is depressed before operating the handle 12. This causes the link 25 to engage with lever 16 prior to the beginning of the movement of the cam plate 19, so that the pinions 8 are engaged with their operating racks prior to the forward movement of the strips 3. Therefore during such forward movement of the strips the pinions 8, will, as above described, be returned to zero position and the recording devices actuated to record the total of the previously accumulated items. If the parts remain in this position, so that the pinions 8 are in engagement with the rack 7, during the return movement of the strips 3, the effect will be, as above described, to restore the pinions to the positions in which the accumulating

mechanism will indicate the sum of the previously recorded items. Therefore if it is desired to leave such pinions and accumulating devices in their normal or zero positions after recording the total of a plurality of items, it is necessary to disengage the pinions from the racks prior to the beginning of the return movement of the strips 3. By the present invention at the termination of the forward movement of the strips 3, the link 25 and lever 16 engaged therewith will be moved rearwardly by reason of a stud or pin 29 on the cam plate 19 rocking the plate 28, by engaging with a dog 30 thereon, and the link 15 will be drawn rearwardly opening the toggle and permitting the pinions 8 to rise from engagement with their operating racks. By this operation therefore the accumulating devices will be left at zero following the operation of the machine with the key 27 depressed, during which operation the total of previously accumulated items will be recorded. As above noted, when the lever 21 is swung forward, its laterally projecting foot 24 is brought into position beneath the link 25, and therefore it is impossible for said link to move downwardly into engagement with the stud on lever 16, and consequently neither the sub-total key 26 nor total key 27 is operative to effect any result when the lever 21 is in the position shown in Fig. 6. This is an important feature, as without it an operator might unintentionally clear the machine or take a total while intending merely to record an item without having the value thereof accumulated by the accumulating devices.

As shown clearly in Figs. 2 and 3, the laterally projecting foot 24 of the lever 21 is provided with a slot through which the lever 16 extends, so that while it affords a firm and positive stop preventing downward movement of the link 25, it does not interfere at all with the forward movement of the lever 16.

What I claim is:—

1. In a combined adding and recording machine, the combination of recording devices, accumulating devices including reciprocating racks, each connected with a member of the recording devices, and pinions adapted to be moved to and from engagement with said racks, means for effecting engagement of the racks and pinions and maintaining such engagement during movement of the racks in one direction to produce an actuation of the accumulating devices corresponding to a recording operation of the machine, and means operative at will for disengaging the pinions and racks prior to the latter imparting any movement to the pinions, whereby a number may be recorded without causing an accumulating movement of the pinions.

2. In a combined adding and recording machine, the combination of recording devices, accumulating devices including reciprocating racks, each connected with a member of the recording devices, and pinions mounted to move bodily to and from engagement with said racks, an operating handle, means for operating the recording devices and moving the racks during a movement of the operating handle in one direction, means for moving the accumulating pinions into engagement with the racks at the termination of such movement and retaining said engagement during the return movement of the handle, and means operative at will for disengaging the pinions and racks prior to the latter imparting any movement to the pinions, whereby an item may be recorded without effecting any turning movement of the pinions.

3. In a combined adding and recording machine, the combination with an accumulating device, including a reciprocatory rack and a pinion adapted to be moved bodily toward and from said rack and to be rotated thereby, recording devices having a member connected with said rack whereby the rack will be reciprocated at each operation of the recording devices, of means adapted to move the pinion relative to said rack and normally retain the same in engagement therewith during the last half of said reciprocation of the rack, and means adapted to instantly swing the pinion from engagement with the rack as the latter commences its return movement to prevent any operation of the pinion by the rack, substantially as and for the purpose described.

4. In a combined adding and recording machine, the combination with accumulating devices including reciprocatory racks and pinions movable bodily to and from said racks and adapted to be rotated thereby, recording devices, means for reciprocating one or more of the racks whenever a number is recorded by the recording devices, and means for moving the pinions bodily relative to the racks to engage the latter during a portion of each reciprocation of the racks, of means for swinging said pinions out of engagement with the racks immediately after the engagement thereof to prevent any movement thereof by the racks, whereby a number may be recorded without actuating the accumulating devices.

5. In a combined adding and recording machine, the combination of accumulating devices including reciprocatory racks, pinions adapted to mesh with said racks, and a swinging frame in which said pinions are mounted, recording devices, means for reciprocating one or more of the racks of the accumulating devices whenever a number is recorded by the recording devices, means

for moving said swinging frame to cause the pinions supported thereby to engage said racks, and means for disengaging said pinions and racks during a movement of the latter incident to an operation of the recording devices and prior to any movement of the pinions by the racks, for the purpose specified.

6. In a combined adding and recording machine, the combination of recording devices, accumulating devices, including reciprocatory racks each connected with a movable element of the recording devices, and pinions each supported by a frame mounted to move to and from a position where they will engage said racks, a link connected with the movable pinion supporting frame of the accumulating devices and adapted to be reciprocated, whenever the machine is operated to record a number, to move the pinions into engagement with the racks, and means for moving said link to disengage said pinions and racks prior to any movement of the pinions by the racks, for the purpose specified.

7. In a machine of the character described, the combination of means for recording items, means for accumulating items, actuation of the item recording means normally producing corresponding movement of the accumulating means, totalizing devices requiring actuation prior to recording the sum of accumulated items, and means operable at will for obtaining independent actuation of the recording means and simultaneously preventing actuation of the totalizing devices.

8. In a machine of the character described, the combination of means for recording items, means for accumulating items, devices requiring actuation prior to recording a total or sub-total of accumulated items, and means operable at will for preventing actuation of said devices and the accumulating means while the means for recording items are operative.

9. In a machine of the character described having means for accumulating totals, means for recording items and totals and sub-totals, keys controlling the recording of totals and sub-totals, and means operative at will for preventing operation of the accumulating devices and the total and sub-total keys without interfering with the operation of the recording devices.

10. In a combined adding and recording machine, the combination of recording devices, accumulating devices including reciprocating racks, each connected with a member of the recording devices, and pinions adapted to be actuated by said racks, means for moving the pinions bodily relative to the racks, including a swinging member, as the lever 16, adapted to be positively moved in opposite directions by a vibratory actuator, and a spring adapted to be placed under tension by the movement of said vibratory actuator by which the racks and pinions are engaged and to effect a disengagement of said elements of the accumulating devices during the return movement of said actuator and before the pinions have been actuated by the racks.

11. In a combined adding and recording machine, the combination of recording devices, accumulating devices including reciprocating racks, each connected with a member of the recording devices, and pinions adapted to be actuated by said racks, means for moving the pinions bodily relative to the racks, including a swinging member, as the lever 16, adapted to be positively moved in opposite directions by a vibratory actuator, and a spring adapted to be placed under tension by said swinging member during a movement effecting engagement of the racks and pinions and to cause disengagement of said elements of the accumulating devices before the pinions have been actuated by the racks.

12. In a combined adding and recording machine, the combination of recording devices, accumulating devices including reciprocating racks, each connected with a member of the recording devices, and pinions adapted to be actuated by said racks, means for moving the pinions bodily relative to the racks, including a swinging member, as the lever 16, adapted to be positively moved in opposite directions by a vibratory actuator, and a leaf spring adjustably supported in the path of said swinging member and adapted in one position to be placed under tension by the movement of said swinging member that effects engagement of the racks and pinions and to cause a disengagement of said elements of the accumulating devices before the pinions have been actuated by the racks.

13. In a combined adding and recording machine, the combination of recording devices, accumulating devices including reciprocating racks, each connected with a member of the recording devices, and pinions adapted to be actuated by said racks, means for moving the pinions bodily relative to the racks, including a swinging member, as the lever 16, a vibratory actuator adapted to positively engage said swinging member near the termination of its movement in each direction, and means operative at will for adjusting the swinging member to prevent actuation of the pinions by the racks.

14. In a combined adding and recording machine, the combination of recording devices, accumulating devices including reciprocating racks, each connected with a member of the recording devices, and pinions adapted to be actuated by said racks, means for moving the pinions bodily relative to the

racks, including a swinging member, as the lever 16, a vibratory actuator adapted to positively engage said swinging member near the termination of its movement in each direction, the pinions and racks being normally engaged during the interval between the periods of engagement of the actuator and swinging member, and means operative at will for effecting disengagement of said elements of the accumulating devices before the pinions are actuated by the racks.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM H. PIKE, JR.

Witnesses:
J. L. WHITE,
E. G. LANGHORNE.