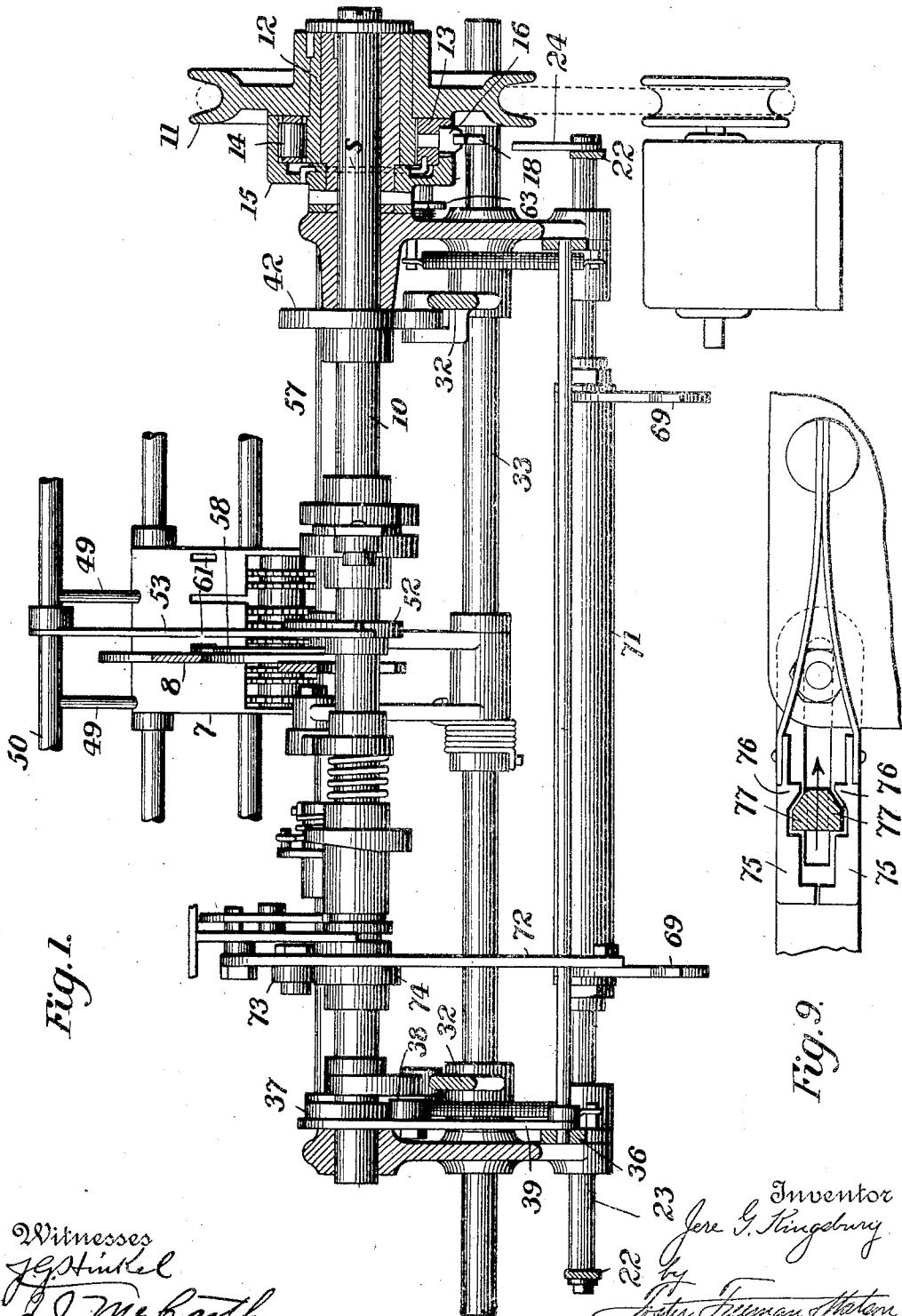


J. G. KINGSBURY.
 ADDING TYPE WRITER.
 APPLICATION FILED APR. 16, 1906.

932,786.

Patented Aug. 31, 1909.
 4 SHEETS—SHEET 1.



932,786.

Patented Aug. 31, 1909.

4 SHEETS—SHEET 2.

Fig. 2.

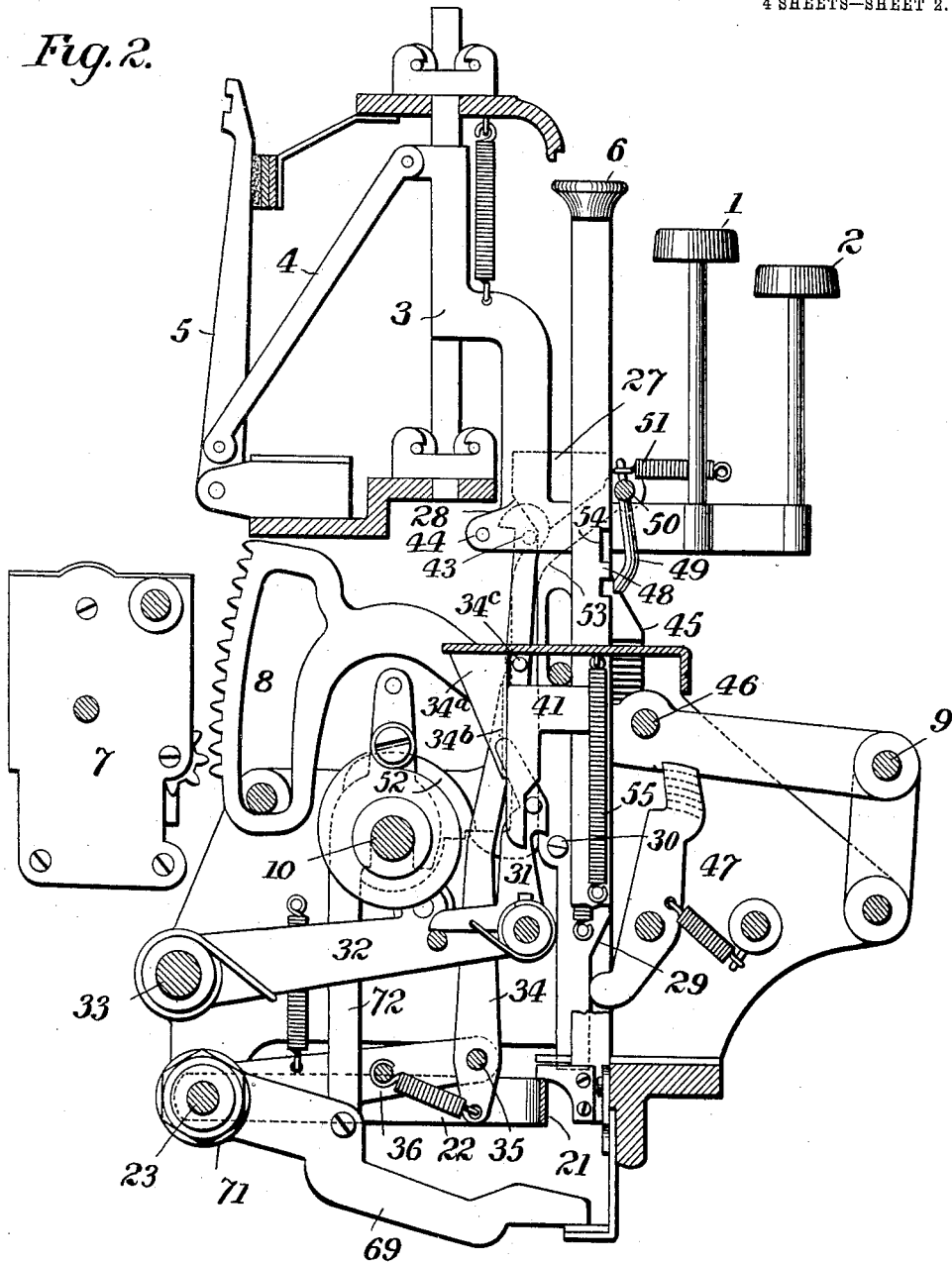
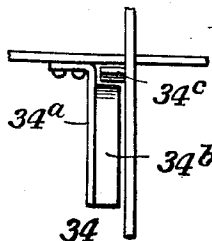


Fig. 10.



Witnesses
J. G. Stinkel
J. J. M. Carthy

Inventor
J. G. Kingsbury
 by *Foster Sullivan Matson*
 Attorneys

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4 SHEETS—SHEET 3.

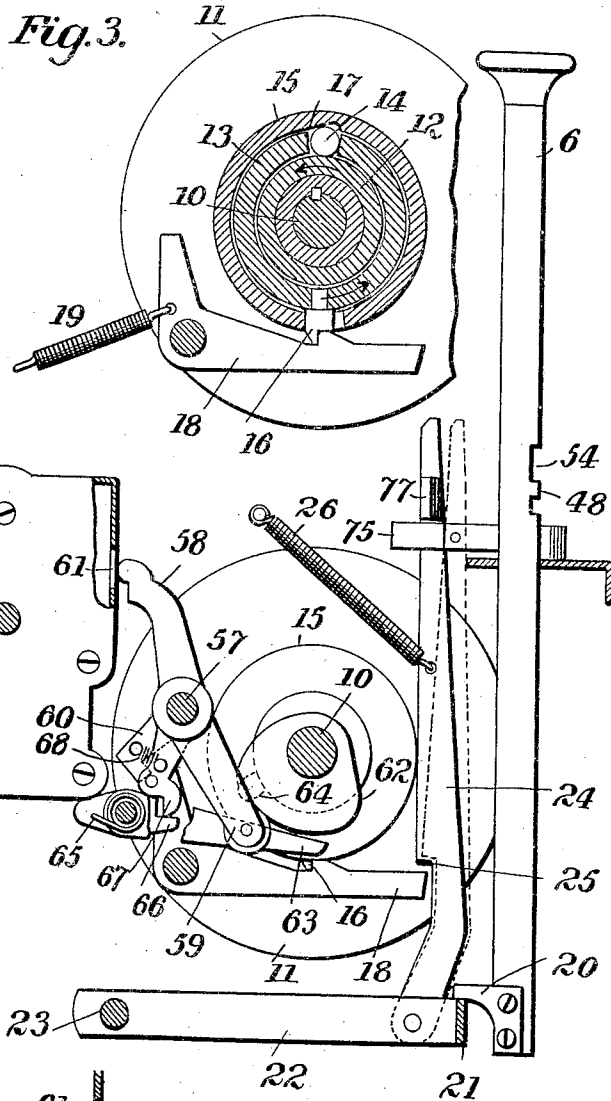


Fig. 4.

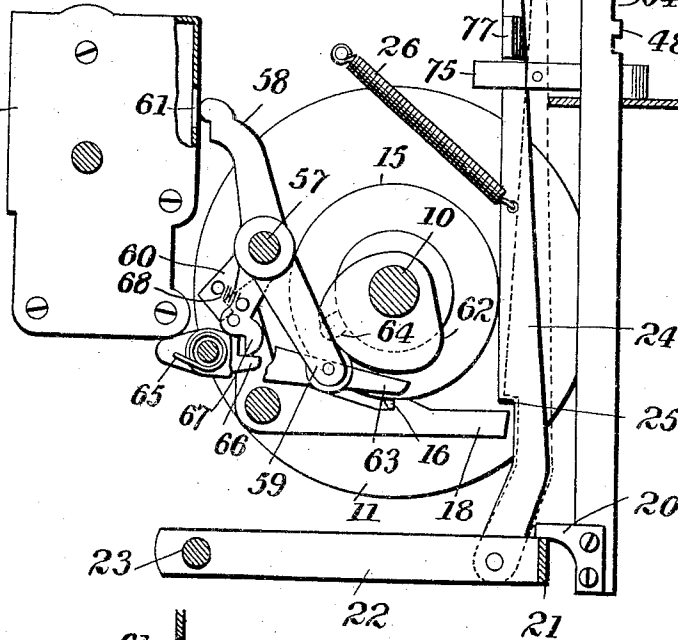
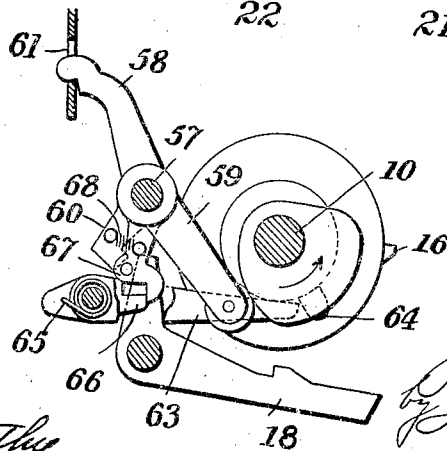


Fig. 5.



Witnesses

J. J. Hinkel

J. J. Mc Carthy

Inventor

J. G. Kingsbury

Robert F. Heman & Watson

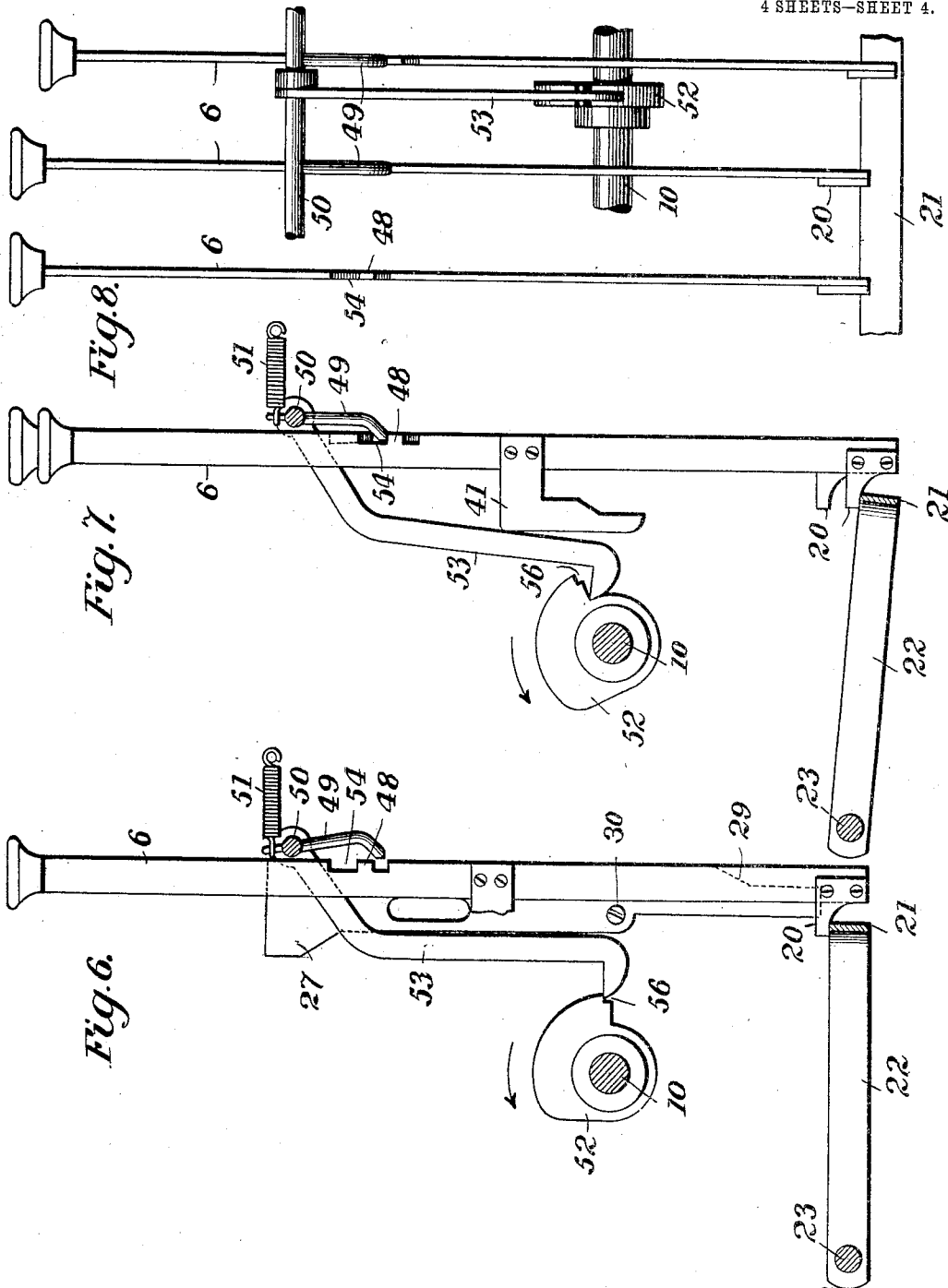
Attorneys

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4 SHEETS—SHEET 4.



Witnesses

J. G. King
J. J. McCarthy

by

Jere G. Kingsbury
Foster Freeman Matern
 Attorneys

UNITED STATES PATENT OFFICE.

JERE G. KINGSBURY, OF ORANGE, NEW JERSEY, ASSIGNOR TO NEW YORK ADDING TYPEWRITER COMPANY, OF ORANGE, NEW JERSEY, A CORPORATION OF MISSOURI.

ADDING TYPE-WRITER.

932,786.

Specification of Letters Patent.

Patented Aug. 31, 1909.

Application filed April 16, 1906. Serial No. 311,994.

To all whom it may concern:

Be it known that I, JERE G. KINGSBURY, a citizen of the United States, residing at Orange, Essex county, State of New Jersey, have invented certain new and useful Improvements in Adding Type-Writers, of which the following is a specification.

The present invention relates to improvements in combined typewriting and adding machines in which the adding and recording mechanisms are simultaneously operated by power mechanism controlled by suitable devices, hereinafter termed "shifters" which are manipulated by the operator. In the ordinary operation of such a machine, the power shaft is released and permitted to make a single rotation when any one of the series of shifters is actuated; and the parts are so constructed and arranged that the power shaft will be automatically checked on the termination of a single rotation whether the actuated shifter be maintained in the adjusted position to which it is moved to permit of the operation of said shaft, or released prior to the completion of said rotation. Under certain conditions, however, it is necessary that the power shaft make two successive rotations and that the recording devices be actuated only during the first of said rotations. At such times it is necessary that the operative shifter be moved from the position assumed prior to the commencement of the shaft's rotation in order to permit a disengagement of the printing or recording devices and said shaft during the second rotation, whether the operator releases said shifter or not. To provide means for accomplishing this result is one of the important features of the present invention.

A further object of the invention is to provide means for positively limiting the movement of the actuating device of the adding or accumulating mechanism to that required for accumulating the value represented by the numeral key associated with the particular shifter which is operated.

A further object of the invention is to provide means whereby when any one of the series of shifters is actuated, it will be retained in its shifted position until the rotation of the driving shaft has commenced and every other one of the series of shifters will be locked in its normal position so that it will be impossible to actuate a second shifter until the rotation of the driving shaft per-

mitted by the operation of the first shifter is completed.

The invention is illustrated in the accompanying drawings, as applied to a combined typewriting and adding machine of the character illustrated in detail in the application of Frederick A. Hart, filed Apl. 16th, 1906, and only such parts of said machine as are necessary to illustrate the present invention are shown.

Figure 1 is a plan view, partly in section, of a combined typewriting and adding machine having the present invention applied thereto; Fig. 2 is a transverse vertical sectional view through a portion of the machine illustrating the connections between the actuating devices of the adding mechanism and the recording devices; Fig. 3 is a sectional view of the clutch connecting the driving shaft with the motor; Fig. 4 illustrates the connection between the shifters and the power shaft releasing devices; Fig. 5 is a detail view; Fig. 6 illustrates the locking devices for the shifters, the latter being shown in their normal inoperative positions; Fig. 7 is a similar view showing the position of said locking devices when one of the shifters is actuated; Fig. 8 is a face view of the parts shown in Fig. 7; Fig. 9 is a detail view of a lock for the starting devices; Fig. 10 is a detail view.

Referring to the drawings, 1 designates a numeral key of a combined typewriting and adding machine, and 2 one of the letter or other character keys of such machine. Each of said keys is connected with a sliding frame 3, which is connected by a link 4 with a pivotally mounted type bar 5.

It will be understood that the machine is provided with the usual number of keys 1, 2, but for the purposes of the present invention it is believed to be unnecessary to illustrate more than one of each. In addition to the usual numeral and character keys, the machine is provided with a series of devices termed "shifters" because they do not themselves operate any part of the accumulating or printing devices, but serve to shift parts into position to be actuated, or to actuate, the operating mechanism. These shifters are shown in the form of keys 6, there being one of said shifters for each of the numeral keys 1.

When either of the keys 1, 2 is actuated, the printing devices connected therewith will

be operated in the ordinary manner, but the actuation of such keys 1, 2, will not operate the adding mechanism 7. This mechanism, which may be of any suitable character, is mounted on the carriage of the machine, not shown, and is adapted to be actuated by a rack, shown as a sector 8, which rack is pivotally supported at its forward end, as at 9, and is adapted to be moved to and from a position where it will engage with the pinions of the adder 7, when the latter are in proper position, by suitable means.

When it is desired to simultaneously print and accumulate the numeral represented by any of the keys 1, the corresponding shifter 6 is depressed and thereby parts are so positioned that on the release of a detent or lock normally holding a driving or power shaft 10 stationary, said shaft is connected with the means for depressing the sector 8 and also with the sliding frame 3 of the numeral key 1 corresponding to the actuated shifter.

A constantly rotating pulley 11 is adapted to be connected with the shaft 10, to impart a single rotation thereto and then be automatically disconnected therefrom when any one of the shifters 6 is actuated. Between the pulley 11 and shaft 10, is arranged a suitable clutch. The pulley carries a hardened steel sleeve or bushing 12, and about the latter is loosely arranged a ring 13 notched to receive a hardened cylinder or roller 14. The ring 13 and roller 14 are inclosed by a muff 15 which is keyed to the shaft 10, and a bent spring S, Fig. 1, is connected at one end to the muff and at the other end to the ring 13.

A pin 16 projects from the ring 13 through a slot in the muff, and the coiled spring tends to turn the ring to throw said pin in the direction of the rotation of the shaft, Fig. 3.

Within the muff is an inclined face 17 opposite the roller 14, and a detent 18 normally engages the pin 16 and tends to hold the parts in the position shown in Fig. 3, where the shaft 10 is held stationary, while the pulley 11 constantly rotates.

A spring 19 constantly acts to hold the detent 18 in the position shown in Fig. 3. If said detent is depressed or moved to release the pin 16, the ring 13 will be moved by the spring connected therewith to carry the roller 14 between the sleeve 12 and the inclined face of the muff so that the latter is clutched to the sleeve, and thereby the pulley 11 will be connected with the sleeve and shaft.

The parts are so arranged that on depressing any shifter when the accumulating mechanism or adder 7 is in position to be actuated by the sector 8, the detent 18 will be depressed and the shaft 10 connected with its driving pulley 11. The spring 19 acts to return the detent to its normal position, af-

ter the pin 16 passes from contact therewith, and as the rotation of the shaft is completed, said pin again strikes the shoulder of the detent and a slight rotation of the shaft is permitted by the compression of the spring connecting the ring 13 with the muff, while said ring remains stationary. This carries the inclined surface 17 of the muff to a position to release the grip on the roller 14 so that the pulley 11 turns without moving the shaft.

As shown, each of the shifters 6 is provided with a finger or lug 20 adapted to engage a cross bar 21 of a frame 22, which is pivotally supported at 23, and to this frame 22 is pivotally connected the lower end of a catch 24, a shoulder 25 on which is adapted to engage the end of the detent 18. A spring 26 connected to the catch 24 tends to lift said catch and also carry it toward the detent 18. On depressing any shifter, the frame 22 is depressed with the catch 24 which depresses the detent 18 so that the pin 16 escapes the shoulder on said detent, and the shaft 10 begins its rotation. As the shaft turns, the pin 16 contacts with the catch 24 and pushes it forward thus releasing the detent which is immediately lifted by its spring 19 to intercept and engage the pin 16 and arrest the shaft 10 on the completion of its rotation.

Coöperating with and adjacent each shifter 6 is a vertical cam blade or plate 27 having cam faces or inclined edges 28, 29, and a lug 30, extending from one side of the plate, is adapted to be engaged by a catch 31 pivoted to the cross bar of a frame 32, pivoted at 33 to the main frame. A series of hooks 34 are each pivoted at the lower end to the cross bar 35 of a frame 36, which frame is depressed by the action of a cam 37 upon the shaft 10, acting upon a roller 38 carried by a blade 39 connected at its lower end with said frame 36.

The stem of each shifter 6 carries a bracket 41, adapted to engage the adjacent catch 31 so that when the shifter is depressed said catch will be moved to bring its hook or shoulder over the lug or stud 30 of the adjacent cam plate 27 and when the frame 32 is thereafter moved downward the catch will descend and carry with it the cam plate which, through suitable connections, operates the frame 3 of the numeral type lever corresponding to the depressed shifter.

The downward motion of the frame 32 is not produced by the shifter itself, but results from the rotation of the driving shaft 10 through suitable devices, as for instance a cam 42 upon said shaft engaging a roller on the frame. Suitable springs are provided for lifting the cam plate 27 and shifter when the latter is released. As the cam plate 27 begins to move downward, under the action of the frame 32, the catch 31 having engaged the stud 30, the cam edge 28

bearing upon a lug 43 at the side of the adjacent hook 34, carries the latter over a stud 44, upon the sliding numeral type bar frame 3, corresponding to the depressed shifter, and draws down said sliding frame and its connected type lever.

To insure the engagement of the hook 34 with the stud 44 throughout the entire movement of the frame 36, a suitable guide is supported on the frame of the machine. As shown, this guide is part of a bracket which consists of two members 34^a, 34^b, which extend at right angles to each other. The member 34^b is supported by 15 and is somewhat shorter than the member 34^a or is cut away at its upper end to provide a slot through which a pin 34^c on the hook 34 passes when said hook is engaged with the stud 44. As the hook 34 20 moves downwardly, the pin 34^c after passing through said slot to the rear is in rear of the member 34^b and thereby the hook is prevented from moving forward out of engagement with the stud 44 until on the return 25 movement of the frame 36, the pin 34^c reaches the upper end of its travel, when it may pass forwardly through the aforesaid slot.

The extent to which the rack or sector 8 is depressed, depends upon the particular shifter and cam plate 27 which is operated, 30 each of said cam plates having a wing 45 which is above a cross bar 46 connected with the sector, and these wings 45 are at successively greater distances from said cross bar, 35 corresponding to the value of the numbers upon the shifters co-acting with the cam plates respectively, so that the cam plate adjacent to the shifter having thereon the number of highest value will have its wing 40 brought into contact with the cross bar 46 directly after the cam plate begins this downward movement, while the wing of the cam plate co-acting with the shifter having the lowest figure will only be brought into 45 contact with said cross bar just before the cam plate has completed its downward movement.

To secure a positive throw and movement of the sector and prevent it from exceeding 50 the precise extent of movement required, there is provided a series of pivotal stop levers 47, so arranged that the tail of each lever is opposite the edge 29 of one of the cam plates, so that on the descent of the 55 latter said cam edge 29 will bear on this tail and swing the upper end of the stop lever into the path of the bar 46 connected with the sector, said levers being of different lengths, so that the upper end of each lever 60 will define exactly the lowest position of the sector which is carried down by the wing 45 co-acting with the stop lever which is rocked.

If a shifter is struck percussively and

could immediately return to its elevated position, the catch 31 might not remain above 65 the stud 30 for a sufficient length of time to insure the proper engagement of the catch and stud, and it is therefore desirable to hold the shifter stem in its downward position 70 after being struck for a sufficient length of time to insure a proper co-action of the parts. This is insured by providing the stem of each shifter with a shoulder 48 adapted to be engaged by one of a series of 75 fingers 49 upon a rock shaft 50 which extends across the stems of all the shifters and is swung to carry the fingers toward the stems by means of a spring 51. This movement, however, is limited by a cam 52, upon 80 the shaft 10, which cam engages an arm 53 extending from the shaft 50 and passes from engagement with said arm immediately after the shaft 10 begins a rotation.

On the escape of the cam from the arm 53, 85 the spring 51 will rock the shaft 50 and carry the fingers 49 toward the shifter stems, and the end of the finger adjacent or in line with the depressed shifter, will be brought into position above the shoulder 48 on said 90 shifter and hold the latter down, while the other fingers 49 will extend into recesses 54 of the stems of the other shifters and hold them in their normal positions. As the shaft 10 continues to rotate the cam 52 will engage 95 the arm 53 and rock the shaft 50 to carry all of the fingers 51 away from the shifters when the depressed shifter will be released and will be carried upward by its spring 55, the cam and shaft 10 being arrested with the parts in the position shown 100 in Figs. 2 and 6. When the parts are in this position, the toe of the arm 53 rests in a notch 56 in the cam 52.

It will be understood that the adder is 105 moved by the carriage of the machine transversely past the sector 8 with a step by step movement, such a feeding being imparted to the adder after each actuation of the sector.

Referring to Fig. 1, it will be seen that the 110 actuating pinions of the adder are uniformly separated except between those representing the cents and dollars columns, those representing the hundreds and thousands columns, and those representing one hundred, thou- 115 sands and millions. With this arrangement, it will be evident that after printing the last figure in the division representing millions, or thousands, it will be necessary to move the adder an additional space without printing. 120 Various means may be employed for effecting this result. As shown, a rock shaft 57 carries three arms 58, 59, 60, the arm 58 being adapted to bear on the surface of the case of the adder 7, which latter has slots 61 125 corresponding in position to the spaces between each of the aforesaid divisions of the actuating pinions. The arm 58 is pressed

toward the adder case by a suitable spring. The arm 59 carries at its free end a roller which extends into the path of a cam 62 on the shaft 10, which is adapted to rock the shaft 57 to carry the arm 59 rearwardly just before the feeding of the adder occurs. A pivotally mounted catch lever 63 projects below the shaft 10, and the forward end thereof is adapted to be depressed by a lug 64 on the shaft, said catch lever being moved toward the shaft by a spring 65 and having a shoulder 66 with which a latch 67 mounted on the arm 60 is adapted to engage, said latch being also connected with the arm 60 by a coiled spring 68. The latch 67 carries a pin or stud adapted to engage the tail of the detent 18, which, as before described normally holds the shaft 10 stationary.

As long as the arm 58 bears against the surface of the adder case, the depression of the detent 18 will result in permitting a single rotation of the shaft 10. But, if, after a shifter 6 is depressed, the next feed of the carriage and adder brings a slot 61 opposite the lever 58, the latter will swing to the position shown in Fig. 5 (the cam 62 and lug 64 having rotated beyond the end of the catch lever 63) and the latch 67 will engage the shoulder 66 and be retained in said position until after the beginning of the second rotation of the shaft 10. When the latch 58 is thus moved rearwardly and the latch 67 forwardly, the pin or stud carried by the latter is in engagement with the tail of the detent 18 and holds the latter down in the position shown in Fig. 5 so that, as the shaft 10 completes its rotation, said detent will be out of engaging position. After the shaft commences its second rotation, the lug 64 thereon contacts with the catch lever 63 and depresses it, which carries the shoulder 66 from engagement with the latch 67, allowing it to return to its normal position while the cam 62 acting on the arm 59 rocks the shaft 57 to carry the arm 60 rearwardly. The detent 18 is then free to engage the pin 16 and arrest the shaft at the end of the second rotation.

During the before described second rotation of the shaft 10, it is desirable that the shifters 6 shall remain up in normal position, as, if a shifter should be depressed after the first rotation, it would result in connecting one of the sliding frames 3 with the shaft and a figure would be printed where there should be a blank space. If the operator removes his finger from the depressed shifter prior to the beginning of the second of two successive rotations, required under certain conditions, as before described, there would, of course, be no danger of a printing being effected by the second rotation. If pressure is maintained on the shifter and the catch 31 is not moved from engagement with the stud 30, however, a second printing will occur. Therefore,

means are provided by which even though pressure is maintained on the shifter, no printing will take place during the second rotation of the shaft. This is accomplished by positively lifting the depressed shifter 6 sufficient to insure the disengagement of the catch 31, which is effected by rock arms 69, swinging on the rod 23 and positively lifted at each actuation of the shaft 10 so that each arm 69 may strike the cross bar 21 of the frame 22, and lift the frame and the depressed shifter to a limited extent. As shown, a sleeve 71 incloses the rod 23 and the arms 69 are connected to said sleeve and to one of the arms is pivoted a blade 72 carrying a roller 73 which bears on a cam 74 on the shaft 10, which cam acts to impart the proper movements to the arms 69.

By means of the devices just described, the catch 24 will be moved upward with the frame 22 during the second revolution of the shaft 10 so that the detent 18 will be released and be returned by its spring 19 into position to engage the pin 16 on the termination of the second revolution.

As the frame 22 is, as just described, lifted by the arms 69 at each revolution of the driving shaft 10, it will be seen that the shoulder 25 of the catch 24 will be carried at each revolution above the end of the detent 18 and if the previously depressed shifter 6 is still depressed by the operator, the frame 22 will be instantly forced down as the arms 69 move from engagement therewith, and said downward movement of the frame 22 will cause the catch 24 to again trip the detent 18 and cause another revolution of the shaft 10, and this operation would be repeated as long as pressure is maintained on the shifter 6. To prevent this during the normal operation of the machine, the catch 24 extends up between guides 75 on the frame, each of said guides having an inwardly extending projection 76. Adjacent its upper end the catch 24 is provided on opposite sides with projecting ribs 77. When the frame 22 is elevated said ribs 77 are above the guides 75 and when the catch 24 is depressed to trip the detent 18, said ribs project somewhat below the guides.

As the shaft 10 revolves the pin or stud 16 contacts with the catch 24 and rocks it about its pivot to carry the shoulder 25 thereon above the detent 18 and permits the latter to rise. The movement thus imparted to the catch 24 by the pin 16 carries the upper end of the catch forward and brings the ribs 77 thereon between the projections 76 on the guides 75. The ribs 77 are engaged by the projections 76 and the catch 24 held in position where its shoulder 25 will not engage the detent 18 until the frame 22 moves upward to its highest position, when said ribs will be carried above the projections 76 and the catch 24 returned to its original position by 130

the spring 26. It will be understood that the final upward movement of the frame 22 by the arms 69 is not sufficient to release the ribs 77 from the projection 76.

5 Having thus described the invention what is claimed is,—

1. The combination with independent adding and recording mechanisms and a rotatable working shaft, of a plurality of shifters, means supported independently of the shifters operable from each shifter for putting the shaft into operative connection with said mechanisms, and means for locking the remaining shifters in position after one is shifted.

2. The combination with adding and recording mechanisms, and a rotatable working shaft, of a series of keys for directly operating the recording mechanism, an independent series of shifters, means supported independently of the shifters for putting the shaft into operative connection with the said mechanisms, and means for retaining each shifter in position after being shifted and thereafter automatically releasing it as the shaft continues its rotation.

3. The combination with adding and recording mechanisms and a rotatable working shaft, of a series of keys for operating the recording mechanism, an independent series of shifters having shoulders 48 and means supported independently of the shifters for putting the shaft into operative connection with the said mechanisms, catches for engaging said shoulders, and means for retracting said catches as the shaft completes a rotation.

4. The combination with adding and recording mechanisms, a rotatable working shaft and a series of keys for operating the recording mechanism and a series of independent shifters, means for putting the shaft into operative connection with said mechanisms, of a series of catches each adapted to engage one of said shifters, means connected with the said shaft for normally holding said catches out of engagement with the shifters, and means for moving all of said catches into engagement with the shifters as the shaft rotates, whereby said shifters will be locked during the rotation of the shaft.

5. The combination with adding and recording mechanisms and a rotatable working shaft and a cam thereon, of a plurality of shifters each adapted to operate means supported independently of the shifters for putting the shaft into operative connection with the said mechanisms, a rock shaft having a plurality of catches each adapted to engage one of the shifters, an arm connected with said rock shaft and extending into the path of the cam on the working shaft, whereby said catches are normally held out of engagement with the shifters, and means for moving

said catches into engagement with the shifters as the rotation of the working shaft carries said cam from engagement with the arm on the rock shaft.

6. In a machine of the character described, the combination with adding and recording mechanisms and a rotatable power shaft, of a series of shifters, means for connecting the power shaft with said mechanisms and securing a rotation of said shaft, means for securing a second rotation of said shaft after an actuation of the adding and recording mechanisms in certain positions, and means for preventing shifting of the shifters during such second rotation of the shaft.

7. In a machine of the character described, the combination with adding and recording mechanisms and a rotatable power shaft, of a series of shifters, means for connecting the power shaft with said mechanisms and securing a rotation of said shaft, means for securing a second rotation of said shaft after an actuation of the adding and recording mechanisms in certain positions, and means for positively lifting the depressed shifter prior to the beginning of such second rotation of the shaft.

8. In a machine of the character described, the combination of adding mechanism, recording mechanism, a rotatable working shaft, a series of depressible shifters, means adapted to be actuated by movement of the shifters to connect the power shaft with the adding and recording mechanisms, and means for positively elevating the depressed shifter during each rotation of the power shaft.

9. In a machine of the character described, the combination of adding mechanism, recording mechanism, a rotatable working shaft, a series of depressible shifters, a pivotally mounted frame 22 adapted to be rocked when any shifter is depressed, means adapted to be actuated by a movement of the shifters to connect the power shaft with the adding and recording mechanisms, and means for rocking said frame 22 to elevate a depressed shifter during each rotation of the power shaft.

10. In a machine of the character described, the combination of adding mechanism, recording mechanism, a rotatable working shaft, a series of depressible shifters, a pivotally mounted frame 22 adapted to be rocked when any shifter is depressed, means adapted to be actuated by a movement of the shifters to connect the power shaft with the adding and recording mechanisms, a plurality of pivotally mounted arms 69 extending below said frame, and means connected with said arms and adapted to be actuated by the power shaft to rock said frame and elevate a depressed shifter during each rotation of said shaft.

11. In a machine of the character described, the combination of adding mechanism, recording mechanism, a rotatable working shaft, a motor acting to constantly drive said shaft, a plurality of shifters, means for connecting the power shaft with said mechanisms, a detent normally holding said shaft stationary and adapted to engage the shaft on the completion of each rotation, a catch for shifting said detent when any of the shifters is operated, and means for positively moving said catch from engagement with the detent at each revolution of the shaft.

12. In a machine of the character described, the combination of adding mechanism, recording mechanism, a rotatable working shaft, a motor acting to constantly drive said shaft, a detent normally holding said shaft stationary, a series of shifters, a pivotally mounted frame 22 adapted to be rocked when any shifter is operated, a catch connected with said frame and adapted to engage the detent, and means for positively moving said frame to disengage the catch and detent during each revolution of the working shaft.

13. In a machine of the character described, the combination with adding mechanism, pinions connected therewith, an oscillating and reciprocating toothed sector for operating the adding mechanism, and means for shifting the sector to different positions into and out of engagement with said pinions, of a series of stops for positively limiting said oscillating movements of the sector.

14. In a machine of the character described, the combination with adding mechanism, a toothed sector for operating the adding mechanism, and a series of blades provided with wings in different positions for engaging and moving the sector, of a series of stops for positively defining each movement of the sector.

15. In a machine of the character described, the combination of an adding mechanism, a movable rack adapted to actuate the adding mechanism, a series of plates 27 having wings adapted to engage said rack, a working shaft, means for moving the plates separately therefrom, a cross bar carrying a series of stop levers 47, and means for shifting a stop lever when the adjacent plate is moved to limit the extent of movement of the rack.

16. In a machine of the character described, the combination of an adding mechanism, a recording mechanism, a movable rack adapted to actuate the adding mechanism, a working shaft, a series of shifters, a series of plates 27, each adapted to be oper-

ated by one of said shifters to connect the movable rack and recording mechanism with the working shaft, and a series of stop levers 47 each adapted to be moved by one of said plates to and from position to limit the movement of the rack.

17. In a machine of the character described, the combination of an adding mechanism, a recording mechanism, a movable rack adapted to actuate the adding mechanism, a rod connected with the rack, a working shaft, a series of shifters, a series of plates 27, each adapted to be operated by one of said shifters to connect the movable rack and recording mechanism with the working shaft, cams on said plates, and a series of stop levers of different lengths each having one end extended into the path of the cam on one of the plates 27 and its other end adapted to be moved by said plate into the path of the rod moving with the rack to limit the movement thereof.

18. In a machine of the character described, the combination of an adding mechanism, a type carrier, a slide for moving said type carrier, a series of shifters, a rack adapted to actuate the adding mechanism, a swinging frame carrying hooks each adapted to engage a type carrier slide, a rotatable working shaft adapted to vibrate said frame at each rotation, a series of plates 27 each adapted to be operated by one of said shifters to connect the movable rack with the working shaft and one of said hooks with a type actuating slide, and means for positively holding said hook in engagement with said slide during the movement of its supporting frame.

19. In a machine of the character described, the combination of an adding mechanism, a movable rack adapted to actuate the adding mechanism, a series of type carriers, a working shaft, a pivotally supported frame adapted to be vibrated at each rotation of the shaft, a series of hooks pivotally supported on said frame, a series of plates 27 each adapted to be operated by one of said shifters to connect the movable rack and recording mechanism with the working shaft and to move one of said hooks laterally into engagement with a type carrier slide, and stationary guiding devices for maintaining said hook in engagement with its slide throughout the movement of the frame supporting said hook.

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

JERE G. KINGSBURY.

Witnesses:

JOHN TAYLOR LANGHORNE,
FREDERICK A. HART.