

1,054,874.

Patented Mar. 4, 1913.

3 SHEETS—SHEET 1.

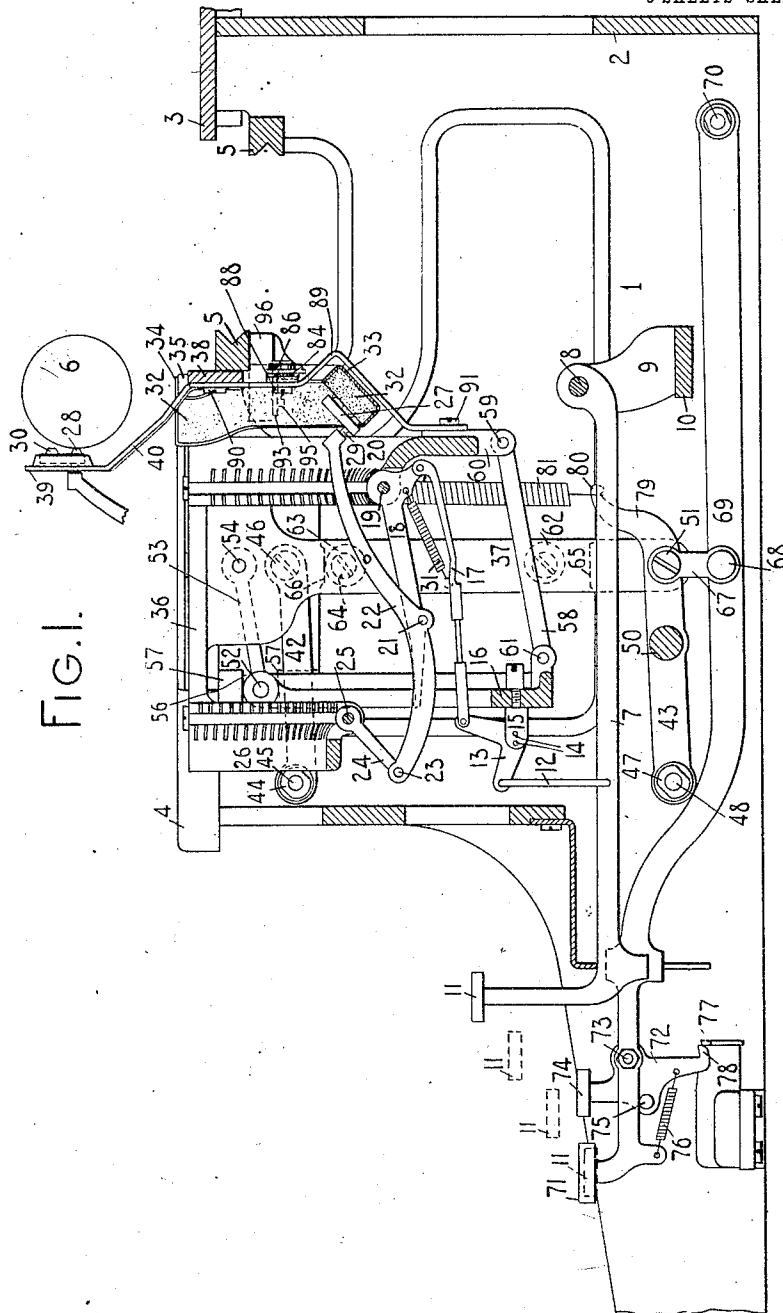


FIG. 1.

WITNESSES:

E. M. Wells.
Charles E. Smith

INVENTOR..

Arthur W. Smith

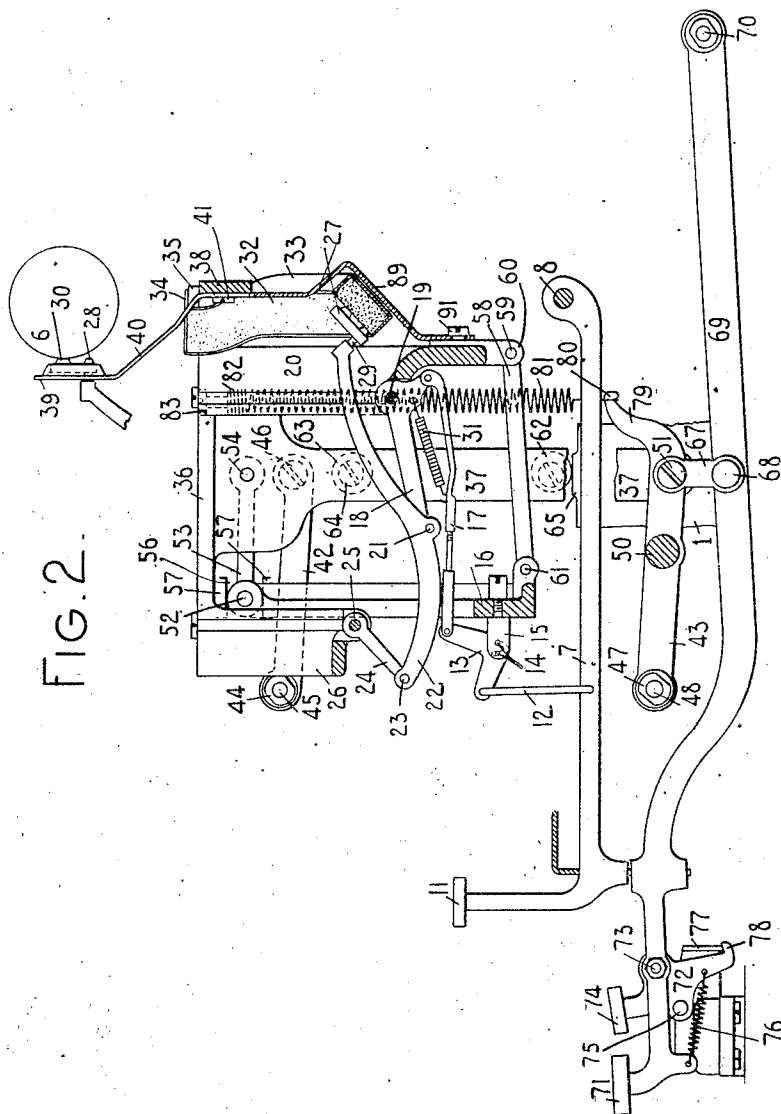
By Jacob Feld

HIS ATTORNEY

A. W. SMITH.
TYPE WRITING MACHINE.
APPLICATION FILED FEB. 23, 1912

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3 SHEETS—SHEET 2.



WITNESSES.

E. M. Wells.

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3 SHEETS-SHEET 3.

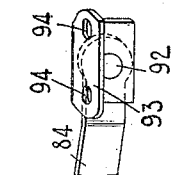


FIG. 4.

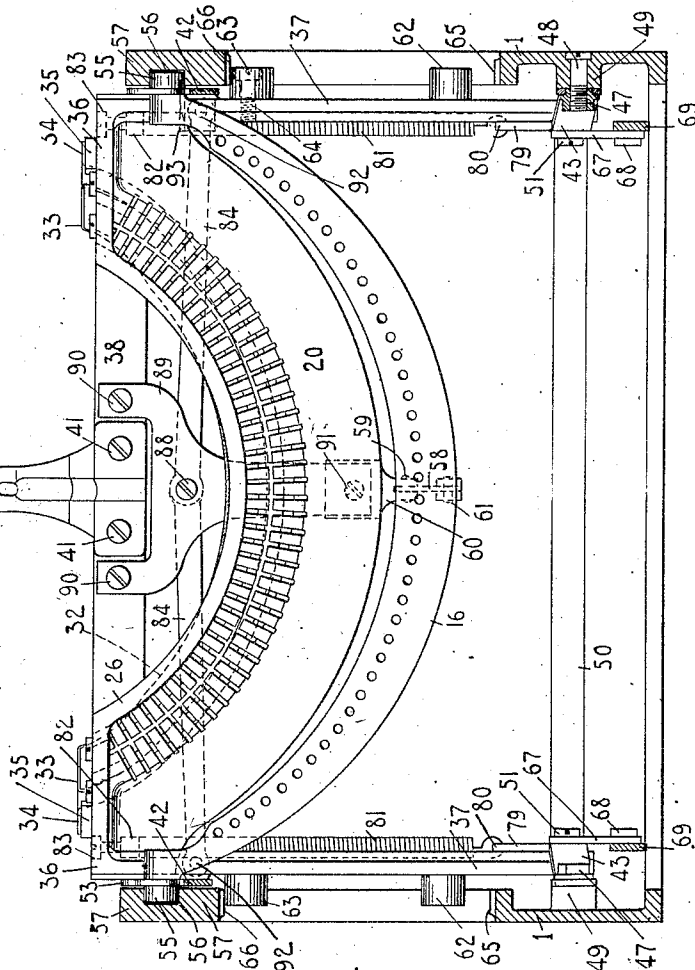


FIG. 3.

WITNESSES:

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UNITED STATES PATENT OFFICE.

ARTHUR W. SMITH, OF NEW YORK, N. Y., ASSIGNOR TO YOST WRITING MACHINE COMPANY, OF ILION, NEW YORK, A CORPORATION OF NEW YORK.

TYPE-WRITING MACHINE.

1,054,874.

Specification of Letters Patent.

Patented Mar. 4, 1913.

Application filed February 23, 1912. Serial No. 679 249.

To all whom it may concern:

Be it known that I, ARTHUR W. SMITH, a citizen of the United States, and resident of the borough of Manhattan, city of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

This invention relates to typewriting machines and more particularly to case shift mechanism for such machines.

The objects of the invention, generally stated, are to provide easily operating efficient and comparatively simple case shifting mechanism which may be actuated with but little noise and in which the shifted part is effectively guided in its case shifting movements and is held against lateral vibration in both the normal and shifted positions.

A further object of the invention, more specifically considered, is to convert a No. 15 Yost machine, for example, and in which the platen receives a case shifting movement, into a shifting basket machine, and to effect such change by comparatively simple means and without the necessity of re-organizing or modifying the type actions of such machines.

A still further object of my invention is to provide means which are applicable alike to both shifting basket and shifting platen machines for locking or holding the shifted part against vibration.

Another object of my invention is to provide effective spring returning means for the shiftable element whether such element be a type basket or a platen.

To the above and other ends which will hereinafter appear, my invention consists in the features of construction, arrangements of parts and combinations of devices to be set forth in the following description and particularly pointed out in the appended claims.

In the drawings wherein like reference numerals indicate corresponding parts in the various views, Figure 1 is a central, vertical, fore and aft section or view, with parts omitted, of one form of typewriting machine embodying my invention. Fig. 2 is a like skeletonized view of the same showing the basket shifted for upper case writing. Fig. 3 is a transverse vertical sectional view of the machine with parts omitted. Fig. 4 is a

fragmentary, detail, perspective view of the locking links and the manner of connecting and adjusting the same.

I have shown my invention embodied in the present instance in a front-strike shifting basket machine, and while certain features of the invention relate particularly to a machine in which the type bars receive a case shifting movement, other features of the invention are also applicable to machines in which the platen receives a case shifting movement as will hereinafter more clearly appear.

The frame of the machine comprises side plates 1, a rear cross plate 2 and top plates 3 and 4. Oppositely grooved guide rails 5 are fixed to the side plates to cooperate with suitable anti-friction rollers to support a suitable carriage in place, such a carriage for example as that employed in the No. 15 Yost machine except that the platen in the present instance is fixed against case shifting movement. Thus the carriage supports a cylindrical platen 6, diagrammatically shown in Figs. 1 and 2, which travels over the top plate from side to side of the machine under control of the usual escapement mechanism and which is held in any suitable manner against case shifting movement.

The type actions shown in the present instance are similar to those employed in the No. 15 Yost machine. Thus, each key lever 7 is pivoted at 8 on a pivot rod which is carried by upwardly extending bracket arms 9 which project from a cross bar 10, said bar being detachably fixed to the side plates 1 of the machine. Each key lever extends forwardly to the keyboard of the machine and is provided with a finger key 11. An upwardly extending link 12 is connected at its lower end to a key lever, and at its upper end to a forwardly extending arm of an angular sub-lever 13. Each sub-lever is pivoted on a double fulcrum, as at 14, to a hanger 15 which is detachably connected to a segment or support 16. A rearwardly extending two-part pull link 17 is connected at its forward end to the upright arm of a sub-lever and is connected at its rear end to a driver 18, the latter being pivoted on a pivot wire 19 carried by a segment or support 20. Each driver 18 is pivoted at 21 to a type bar 22 intermediate the ends of the latter. The forward end of each type bar is

pivoted at 23 to a guide link 24, which latter is pivoted on a pivot wire 25 to a segment or support 26. The rear end of each type bar carries a type block 27 provided with a lower case type 28 arranged directly in line with the stem 29 which connects the type block with the type bar, whereas the upper case type 30 is off-set on the outer or free end of the type block. A contractile returning spring 31 is connected at one end to the associated driver 18 and is connected at its opposite end to the companion pull link 17. This spring is effective to return the various parts of the type action to normal position, with the faces of the types resting against an ink pad 32. The pad is supported by a sheet metal frame or container 33, provided at its upper ends with ears 34 which rest upon parts 35 that are attached to or form part of the segment 20.

The parts of the type actions as thus far described, are similar to the corresponding parts embodied in the No. 15 Yost machine. In that machine, however, type bars are fixed against case shifting movement and the platen 6 is mounted to receive a case shifting movement to bring either the upper or lower case types of the type bar into use. In the present construction the platen 6 is fixed against case shift movement and means are provided whereby the type basket may receive a case shift movement relatively to the platen. By the present invention, the No. 15 Yost machine may be readily converted from a shifting platen machine into a shifting basket machine without modifying the structural features of the type actions as they exist in the shifting platen machine and without modifying the operation of the type actions. The segments 20 and 26 may be cast as one part with the connecting arms, webs or members 36 by which the segments are united at the sides of the machine. Downwardly extending arms 37 project from the connecting members 36 and are preferably formed integral therewith, so that the segments 20, 26, connecting members 36 and the depending arms 37 may all be made as a single casting or frame which is adapted to receive a vertical case shifting movement, as will hereinafter more clearly appear. A separate cross bar 38 extends transversely of the machine, and is detachably connected at its ends by screws to rearward extensions on the members 36. This cross bar constitutes a support for a type guide 39, said guide being formed with a depending arm 40 which is connected to the cross bar 38 by screws 41. The type guide is thus connected for case shifting movement with the segments 20 and 26. Parallel shift links 42, 43 are arranged in two pairs, one above the other, to support the type basket in its case shifting movement. The parallel links 42 are pivoted at their for-

ward ends on shouldered nuts 44, each of which coöperates with the threaded end of a headed screw 45 which is received in an opening in a side plate of the machine. The rear end of each of the links 42 is pivoted on a shouldered screw 46 to one of the depending members 37 connected with the type basket. Each of the set of lower parallel links 43 is pivoted at its forward end on a shouldered nut 47 which coöperates with a headed screw 48 received in the side plate of the machine. Each shift link 43 is confined between the shouldered nut on one side and a lug 49 on the other side, said lug projecting from the side plate of the machine as shown in Fig. 3. The pivotal support at the forward end of each link 42 is similar to the pivotal support for each of the links 43 and the pivots at the same ends of the links 42 are arranged directly above and in the same vertical transverse plane as the corresponding pivots of the links 43. A cross bar 50 extends transversely of the machine between the shift links 43 and is rigidly connected at its ends to said links. Each link 43 is pivoted on a shouldered screw 51 to one of the depending arms 37 of the type basket. It will be seen that the parallel shift links 42 and 43, intermediate the pivotal connection between the type basket and the frame of the machine, are co-extensive in length and that these links, between the points indicated, are also substantially co-extensive in length with the pull links 17 of the type actions and are in effect arranged in substantial parallelism therewith.

The segment 16 by which the angular sub-levers 13 are supported is carried by a fixed portion of the machine and does not receive a vertical case shift movement with the type basket. Said segment is nevertheless moved during the case shift movement of the basket at substantially right angles to the direction of such movement of the basket. This is in order to enable the case shift movement of the basket to be effected without depressing the key levers or affecting the coöperative relation between the various elements of the different type actions. Thus, it will be seen that the segment 16 is pivoted on each side, as indicated at 52, to a link 53, which in turn is pivotally connected at its rear end, as at 54, to one of the depending arms 37 on the shiftable type basket. There are two of these links 53 on opposite sides of the machine connected in a like manner. Each of the pivots 52, by which the links 53 are connected to the segment 16, carries an anti-friction supporting roller 55 which is received in horizontal grooved guide ways 56 formed between fixed lugs 57 which project inwardly from the side plates of the frame. These anti-friction rollers, and the fixed guides in which they are received, sup-

port the segment 16 and the parts carried thereby. A single, centrally disposed, link 58 is pivoted at its rear end as at 59 to a depending projection 60 formed on the segment 20. The forward end of this link is pivoted at 61 to a lug formed on the segment 16.

From an inspection of Fig. 1 it will be seen that the links 53 and 58 are in substantial parallelism although the link 58 is longer than the link 53. When the type basket receives a downward movement from the normal position shown in Fig. 1 to the upper case position indicated in Fig. 2, a slight forward movement of the upper end of the segment 16 is effected by the links 53 moving the segment on its supporting rollers 55 in the fixed guide lugs 57. The lower end of the segment 16 receives a corresponding movement through the centrally disposed link 58, thus producing a bodily forward movement of the segment 16 in a horizontal direction during the vertical case shift movement of the type basket from the position shown in Fig. 1 to that indicated in Fig. 2. The effect of this horizontal movement of the segment 16 is to produce a slight forward bodily movement of the sub-levers 13, thus causing the links 12 to turn around the points of their pivotal connections with the key levers without moving the key levers, and without affecting the effective relation of the different parts of the type action. Therefore, a depression of a finger key transmits the same movement to the associated type bar through the intermediate actuating connections when the type basket is in upper case position that it does when the basket is in the normal or lower case position.

The type basket is limited in its case shifting movements to and from the normal position by stops 62 and 63. There are two such stops 62 and two corresponding stops 63, each of which is formed as an eccentric, being eccentrically mounted on a screw 64 by which the stop is connected to one of the depending arms 37 connected with the type basket. These eccentric stops 62, 63 are preferably made of so-called parchementized or indurated fiber or some such equivalent hard, fibrous, substantially non-resilient, material to form an effective stop, and one which will not readily wear and yet will produce but little noise in limiting the case shifting movements of the type basket to and from normal position. The stops 62 cooperate with stop shoulders 65 formed on the side plates of the machine, whereas the stops 63 cooperate with corresponding shoulders or lugs 66 which are likewise formed on the side plates of the machine. It will be understood that a rotative adjustment of the stops 62 and 63 is effective to vary the extent of case shifting move-

ments of the type basket and to determine the position of the type basket in both its normal and shifted positions. The loosening of a screw 64 enables a rotative adjustment of the companion stop 62 or 63 to be effected, whereas the tightening of the screw clamps the stop in its adjusted position.

Short depending links 67 are pivoted at their upper ends on the shouldered screws 51 to the depending arms 37 of the shiftable frame of the type basket. The lower end of each of these links 67 is pivotally connected at 68 to a shift key lever 69, fulcrumed on the frame of the machine at 70 and extending forwardly to the keyboard, where it is provided with a finger key 71. The depression of either of these finger keys is effective to move the type basket downwardly from the normal position shown in Fig. 1 to the upper case or shifted position indicated in Fig. 2. One of the shift key levers 69 is preferably provided with a locking device 72 pivoted to the lever at 73 and provided with a finger key 74. A stop pin 75 projects from the locking device and engages the lower edge of the associated shift key lever to limit the movement of the locking device in one direction on its pivot 73. A contractile spring 76 is connected at one end to the shift key lever 69 and at its opposite end to the locking device 72. An adjustably mounted fixed engaging member 77 is carried by a side plate of the frame and is adapted to be engaged at its lower edge by a hook-like portion 78 of the locking device as indicated in Fig. 2. It will be understood that a depression of the key 71, on the key lever which carries the locking device 72, is merely effective to shift the type basket, and when the pressure of the finger is released from said shift key the parts will be restored to normal position. When, however, pressure is exerted on the key 74 it is effective to move the shift key lever 69 downwardly until the engaging portion 78 of the locking device reaches the bottom of the engaging member 77 and the pressure exerted on the key is effective to overcome the power of the spring 76, forcing the engaging portion 78 beneath the member 77 and when pressure is released on the finger key 74 the type basket will be locked in the upper case position. Slight pressure exerted by the finger on the associated shift key 71 is effective to overcome the pressure which holds the locking device 72 against the power of its spring 76, and said spring will then be effective to return the locking device to normal position, thus enabling the type basket to return to its normal position when pressure on the finger key 71 is released.

The means for normally maintaining the basket in the elevated position and for counterbalancing the weight thereof will now be

described. It will be observed that each of the parallel links 43 is extended rearwardly and upwardly beyond its point of pivotal connection 51 to form a lever arm 79. Each of these arms is provided at its rear end with a hook-like portion 80 adapted to be engaged by the lower end of a contractile spring 81. The upper end of this spring receives a nut 82 threaded on the outer surface thereof to cooperate with the coils of the spring. The nut is also internally threaded for the reception of a headed screw 83 supported to turn freely in an opening in one of the side members 36 of the shifting frame. By these means the upper end of each spring 81 is connected to and shifts with the type basket, whereas the lower end is connected to one of the levers 43—79 which guide the type basket in its case shifting movements. When a shift key 71 is depressed the rear ends of lever arms 79 travel downwardly faster than the type basket, thereby expanding each of the springs 81 as shown in Fig. 2 and the effective force of these springs is exerted through the levers 79—43 against the pivots 48 to cause the type basket to be shifted upwardly to the normal position when pressure is released on the depressed shift key 71. By these means the type basket is returned to normal position and is normally maintained in such position by the springs 81, notwithstanding the fact that both ends of each spring travel in the direction of the case shifting movement of the type basket. These means for returning the type basket to normal position and counteracting the weight thereof have, in practice, been found to be very effective and to afford an easy shifting movement and an effective restoration of the parts to normal position with but a comparatively small expansion of the restoring springs 81. It will be understood that so far as this feature of the invention is concerned it is immaterial whether the type bars or a platen is the shifted part or is carried by the shiftable frame.

It will be understood that the type basket in its case shifting movements is guided by the parallel links or arms 42 and 43, and is also held by said links in the normal and shifted positions against vibration fore and aft of the machine.

In order to provide against any lateral vibration of the shiftable member or type basket in either its normal or shifted positions, simple and effective means have been provided. Thus, referring more particularly to Figs. 3 and 4 it will be seen that two substantially horizontally disposed locking links 84 are provided, which links extend transversely of the machine. The inner end of each of these links is provided with an enlarged opening 85 which receives a shouldered nut 86, which latter is interiorly

threaded at 87 for the reception of a headed screw 88 that passes freely through an opening in a bracket 89. This bracket is arranged centrally of the machine and is secured at its upper end to the cross bar 38 by screws 90. The lower end of this bracket is secured by a screw 91 to the segment 20. It will be understood therefore that the headed screw 88 is effective to fixedly connect the nut 86 to the bracket so that the nut will constitute in effect a pin which is fixed to the type basket for case shifting movement therewith and that the links 84 cooperate with said pin by a lost motion connection due to the enlarged openings 85 in the links. The outer end of each link 84 is pivoted at 92 to an angular bracket 93, and this bracket has its foot-piece perforated as at 94 with elongated openings which extend transversely of the machine in the general direction of the length of the links 84. Headed screws 95 extend through the openings 94 in each bracket and engage in tapped openings in a lug 96 formed on the frame of the machine to clamp the bracket in its adjusted position. It will thus be seen that each adjustable bracket 93 constitutes means whereby the outer end of its associated link may be adjusted transversely of the machine toward and away from the nut or pin 86. From an inspection of Fig. 3 it will be observed that these links 84, in the normal positions of the parts represented in that figure, extend from their outer ends upwardly to the point of connection with the pin or nut 86. When, however, a shift key is depressed the inner ends of these links will be carried down with the type basket around the fixed pivots 92 and the links will, at the completion of the case shifting movement, extend downwardly and inwardly from the pivots 92 to the nut 86. In other words, at the completion of the case shifting movement the links 84 will assume a position at the opposite side of a line drawn through the pivots 92 which corresponds to the position of the links in the normal disposition of the parts.

In practice, the brackets 93 are adjusted outwardly when the type basket is in either the normal or shifted position until lost motion between the links 84 and the nut 86 is taken up. The brackets are then fixed in the adjusted positions, and it will be understood that each of the links 84 in the normal or shifted position automatically takes up the lost motion between the link and the nut 86 and locks the type basket against lateral movement or vibration but affords an easy case shifting movement of the basket. Thus in either the normal or shifted position of the basket the lost motion between the nut 86 and the links 84 will be taken up, and the right-hand link for example will lock or hold the type basket

against a transverse movement to the left, whereas the left-hand link will lock or hold the basket against a transverse movement or vibration to the right. In this manner the two links cooperate to lock the type basket against a lateral or transverse vibration or play when the type basket is in either the normal or the shifted position. By these means the usual ground guides and roller bearings to guide the type basket and maintain it against lateral vibration may be dispensed with and simple, effective and easily adjusted means may be used in the place thereof.

15 While the locking links 84 have been shown embodied in a machine in which the type basket receives a case shifting movement it should be understood that this feature of the invention is equally applicable to a machine in which the platen receives a case shifting movement. In other words, it is immaterial so far as this feature of the invention is concerned whether the shifting frame with which the links are connected carries the type bars or the platen and which of these members is shifted to effect a relative case shifting movement between the type bars and platen.

What I claim as new and desire to secure by Letters Patent, is:—

1. In a typewriting machine, the combination of a series of type bars mounted for case shifting movement, actuating devices for said type bars, means for effecting a case shifting movement of the type bars in one direction, and means for simultaneously effecting a bodily movement of certain of said actuating devices of all of the type actions in a different direction from that in which the type bars are moved.

2. In a front-strike typewriting machine, the combination of a platen; type bars; means for actuating the type bars; and means for effecting a relative case shifting movement between the type bars and platen, said case shifting means comprising a vertically shiftable support which carries the type bars, a support for certain of the type bar actuating devices, and means for effecting a substantially horizontal movement of said last mentioned support when the type bar support receives a vertical case shifting movement.

3. In a typewriting machine, the combination of a platen, a series of type bars, actuating devices for said type bars, means for effecting a case shifting movement of the type bars, and means for simultaneously effecting a bodily movement of certain of the type bar actuating devices of all of the type bars in a direction at substantially right angles to the case shifting movement of the type bars when the latter receive a case shifting movement.

4. In a typewriting machine, the combination of a platen, a series of type bars, a support for said type bars, said support being shiftable to vary the case position of the type bars relatively to the platen, actuating devices for said type bars, a shiftable support for certain of said actuating devices, and means operable by a case shifting operation for effecting a movement of the support for said actuating devices relatively to the type bar support when the latter is shifted.

5. In a typewriting machine, the combination of a platen, a series of type bars, a support for said type bars, said support being shifted to vary the case position of the type bars relatively to the platen, actuating devices for said type bars, said actuating devices including sub-levers, a shiftable support for said sub-levers, and means for effecting a movement of the sub-lever support relatively to the type bar support when the latter receives a case shifting movement so that the type bar actuating devices may accommodate themselves to the shifted position of the type bars.

6. In a typewriting machine, the combination of a platen, a series of type bars, a support for said type bars, said support being shiftable in one direction to vary the case position of the type bars relatively to the platen, actuating devices for said type bars, a support for certain of said actuating devices, said last mentioned support being shiftable in a different direction from the type bar support, and means for shifting the support for the type bar actuating devices when the type bar support is shifted.

7. In a front-strike typewriting machine, the combination of a platen, a series of type bars, a support for said type bars, said support being vertically shiftable to vary the case shift position of the type bars relatively to the platen, actuating devices for said type bars, a horizontal shiftable support for certain of said actuating devices, and means for effecting a vertical case shifting movement of the type bar support and for simultaneously effecting a horizontal shifting movement fore and aft of the machine of the support for the actuating devices.

8. In a front-strike typewriting machine; the combination of a platen, a series of type bars, a support for said type bars, said support being vertically shiftable to vary the case position of the type bars relatively to the platen, actuating devices for said type bars, a horizontally shiftable support for certain of said actuating devices, anti-friction rollers and guides for supporting said last mentioned support in its horizontal movement and for preventing a vertical movement thereof, and intermediate connections between said supports for effecting a horizontal movement of the support for the

actuating devices when the type bar is shifted vertically.

9. In a typewriting machine, the combination of a series of type bars; actuating devices therefor including a series of sub-levers, and intermediate actuating links between said sub-levers and type bars; a shiftable support which carries said type bars; a shiftable support on which said sub-levers are mounted; and means for effecting a relative movement between the sub-lever support and the type bar support when the latter receives a case shifting movement.

10. In a typewriting machine, the combination of a series of type bars, a series of sub-levers, intermediate actuating links between said sub-levers and type bars, a shiftable support which carries said type bars, a relatively movable support on which said sub-levers are mounted, a case shift key, means controlled thereby for effecting a case shift movement of the type bar support, and means for simultaneously effecting a relative movement of the sub-lever support in a direction transverse to the direction of case shift movement of the type bar support.

11. In a typewriting machine, the combination of a series of type bars, a support which carries said type bars and which is mounted for case shifting movement, a series of actuating devices for the type bars, a support for said actuating devices, said last mentioned support being fixed against movement in the direction of the case shifting movement of the type bar support but movable in a direction at substantially right angles to such direction, and means for effecting a movement of the support for the actuating devices when the type bars receive a case shifting movement.

12. In a typewriting machine, the combination of a platen, printing instrumentalities, means for effecting a relative case shifting movement between the printing instrumentalities and platen, a link operatively connected with the part to be shifted, and a lost motion connection for said link, the construction and arrangement of the parts being such that the lost motion in the lost motion connection will be taken up in the normal and shifted positions of the shiftable part.

13. In a typewriting machine, the combination of a platen, printing instrumentalities, means for effecting a relative case shifting movement between the printing instrumentalities and platen, a pair of oppositely directed links operatively connected to the part to be shifted, and a lost motion connection for each link, the construction and arrangement of the parts being such that the lost motion connection for each link will be taken up in the normal and shifted positions of the shiftable part.

14. In a typewriting machine, the com-

bination of a platen; printing instrumentalities; and means for effecting a relative case shifting movement between the printing instrumentalities and platen, said case shifting means including parallel arms by which the shiftable element is shifted, and links connected with said shiftable element and with the frame of the machine, said links extending at substantially right angles to said parallel arms.

15. In a typewriting machine, the combination of a platen; printing instrumentalities; and means for effecting a relative case shifting movement between the printing instrumentalities and platen, said case shifting means including parallel arms which extend fore and aft of the machine and on which the shiftable element is supported and by which it is guided and receives its case shifting movement, and links which extend transversely of the machine and each of which is connected at one end to the frame of the machine and at the other end to the shiftable element.

16. In a typewriting machine, the combination of a platen; printing instrumentalities; and means for effecting a relative case shifting movement between the printing instrumentalities and platen, said case shifting means including parallel arms by which the shiftable element is shifted, and links connected with said shiftable element and with the frame of the machine, each of said links having a lost motion connection with one of said parts and extending at substantially right angles to said parallel arms.

17. In a typewriting machine, the combination of a platen; printing instrumentalities; and means for effecting a relative case shifting movement between the printing instrumentalities and platen, said case shifting means including parallel arms which extend fore and aft of the machine and on which the shiftable element is supported and by which it is guided and receives its case shifting movement, and links which extend transversely of the machine and each of which is connected at one end to the frame of the machine and at the other end to the shiftable element, each of said links having a lost motion connection with one of said parts, which lost motion is taken up when the shiftable element is in the normal position and when it is in the shifted position.

18. In a typewriting machine, the combination of a platen; printing instrumentalities; and means for effecting a relative case shifting movement between the printing instrumentalities and platen, said case shifting means including parallel arms which extend fore and aft of the machine and on which the shiftable element is supported and by which it is guided and receives its case shifting movement, and links which extend

transversely of the machine and each of which is connected at one end to the frame of the machine and at the other end to the shiftable element, each of said links being
 5 connected at one end to one of said parts by a pin and slot connection and connected at the other end to the other of said parts by an adjustable connection, the pin for each slot being seated in an end thereof when
 10 the shiftable element is in both the normal and shifted positions.

19. In a typewriting machine, the combination of a printing instrumentality, a platen, means for effecting a relative case
 15 shifting movement between the type bars and platen, and links which extend at substantially right angles to each other and which are connected to the member to be shifted, certain of said links having lost motion
 20 connection which is taken up when the shiftable member is in the normal and in the shifted position to hold said shiftable member against lateral vibration.

20. In a front-strike typewriting machine,
 25 the combination of upwardly and rearwardly striking type bars; a platen; and means for effecting a relative vertical case shifting movement between the type bars and platen, said means comprising substan-
 30 tially horizontally disposed parallel arms which extend fore and aft of the machine and by which the shiftable member receives its case shifting movement, and substantially horizontally disposed links which extend
 35 substantially at right angles to said parallel arms and which are connected to the shiftable member to prevent a lateral vibration thereof on the parallel arms.

21. In a front-strike typewriting machine,
 40 the combination of a series of upwardly and rearwardly striking type bars; a support for said type bars, which support is adapted to receive a vertical case shifting movement;
 45 parallel arms on which said type bar support is mounted and by which it is guided in its vertical case shifting movements, said arms extending longitudinally fore and aft of the
 50 machine; and substantially horizontally disposed links which extend at substantially right angles to the parallel arms and each of which is connected at one end to the frame
 55 of the machine and at its opposite end to the type bar support, the connection of each of said links to one of said parts being by a lost motion connection which is taken up when the type bar support is in the normal
 60 or shifted position, thus holding the type bar support against lateral vibration in both the normal and shifted positions.

22. In a front-strike typewriting machine, the combination of a series of upwardly and
 65 rearwardly striking type bars; a support for said type bars, which support is adapted to receive a vertical case shifting movement;
 parallel arms on which said type bar sup-

port is mounted and by which it is guided in its vertical case shifting movement, said
 arms extending longitudinally fore and aft of the machine; substantially horizontally
 70 disposed links which extend at substantially right angles to the parallel arms and each of which is connected at one end to the frame of the machine and at its opposite end to the type bar support, the connection of
 75 each of said links to one of said parts being a lost motion connection which is taken up when the type bar support is in the normal or shifted position thus holding the type bar support against lateral vibration in both the normal and shifted positions; and ad-
 80 justable means at one end of each of said links for adjusting the link longitudinally.

23. In a typewriting machine, the combination of a platen, printing instrumentalities, means for effecting a relative case shifting
 85 movement between the printing instrumentalities and platen, and a rotatively adjustable stop made of fibrous material for limiting the case shifting movement of the shiftable element, said stop having a peripheral
 90 contact face and different portions of which face are brought into use by the rotative adjustment of said stop.

24. In a typewriting machine, the combination of a platen, printing instrumentalities, means for effecting a relative case shifting
 95 movement between the printing instrumentalities and platen, and a plurality of individually rotatively adjustable eccentric stops made of hard fibrous material for limiting the case shifting movements of the
 100 shiftable element to and from normal position, each of said stops having a peripheral contact face and different portions of which face are brought into use by the rotative adjustment of said stop.
 105

25. In a typewriting machine, the combination of a platen, printing instrumentalities, means for effecting a relative case
 110 shifting movement between the type bars and platen, a spring which receives a bodily movement during the case shifting movement of the shiftable part, and means whereby said spring is flexed by such case shifting
 115 movement and is effective to return the shifted part to normal position.

26. In a typewriting machine, the combination of a platen, printing instrumentalities, means for effecting a relative case
 120 shifting movement between the printing instrumentalities and platen, said case shifting means including differential leverage means, and a spring which receives a bodily movement during the case shifting move-
 125 ment, said spring being connected to the differential leverage means to be flexed thereby during the case shifting movement and to apply its force through the differential leverage means to return the shifted
 130 part to normal position.

27. In a typewriting machine, the combination of a platen, a type basket mounted for case shifting movement, means for effecting a case shifting movement of the type basket, and a spring which is connected at one end to the type basket and at its opposite end to the means for effecting a case shifting movement of the type basket, the construction being such that the spring receives a bodily movement with the type basket but is flexed during such case shifting movement from normal position and exerts its force to return the type basket to normal position.

28. In a typewriting machine, the combination with a platen, a series of type bars, a support for said type bars, said support being shiftable to change the case position of the type bars relatively to the platen, key controlled means for effecting a case shifting movement of the type bar support, and a contractile spring which is connected at one end to the type bar support and at its opposite end to the key controlled means for shifting said support, the construction being such that the spring receives a bodily movement with the type bar support in the movement of the latter from its normal position but is expanded during such movement and exerts its force to return the type bar support to normal position.

29. In a typewriting machine, the combination of a platen, a series of upwardly and rearwardly striking type bars, a support for said type bars, which support is adapted to receive a substantially vertical case shifting movement to change the case position of the type bars relatively to the platen, differential key controlled leverage means for effecting a case shifting movement of the type bar support, and a contractile spring which is connected at one end to the type bar support and at its opposite end to the differential leverage means, said contractile spring receiving a bodily movement in the same general direction as

the type bar support but being expanded by the differential leverage means during the movement of the type bar support from its normal position so that the spring exerts its force through the differential leverage means to return the type bar support to normal position.

30. In a typewriting machine, the combination of a platen, printing instrumentalities, parallel arms on which one of the elements is mounted for case shifting movement relatively to the other, one of said arms being extended beyond the point of its connection with the shiftable element, and a spring which receives a bodily movement and is connected at one end to the shiftable element and at its opposite end to said extended part of said arm, whereby the spring is flexed when the shiftable element is shifted from its normal position and the spring exerts its force to return the shiftable element to normal position.

31. In a typewriting machine, the combination of a platen, printing instrumentalities, a support for said printing instrumentalities, parallel arms on which said support is mounted for case shifting movement, one of said arms being extended beyond the point of its connection with said support, and a spring which receives a bodily movement and is connected at one end to said support and at its opposite end to said extended part of said arm, whereby the spring is flexed when the support is shifted from its normal position and the spring exerts its force to return said support to normal position.

Signed at the borough of Manhattan, city of New York, in the county of New York and State of New York this 21st day of February, A. D. 1912.

ARTHUR W. SMITH.

Witnesses:

E. M. WELLS,
CHARLES E. SMITH.