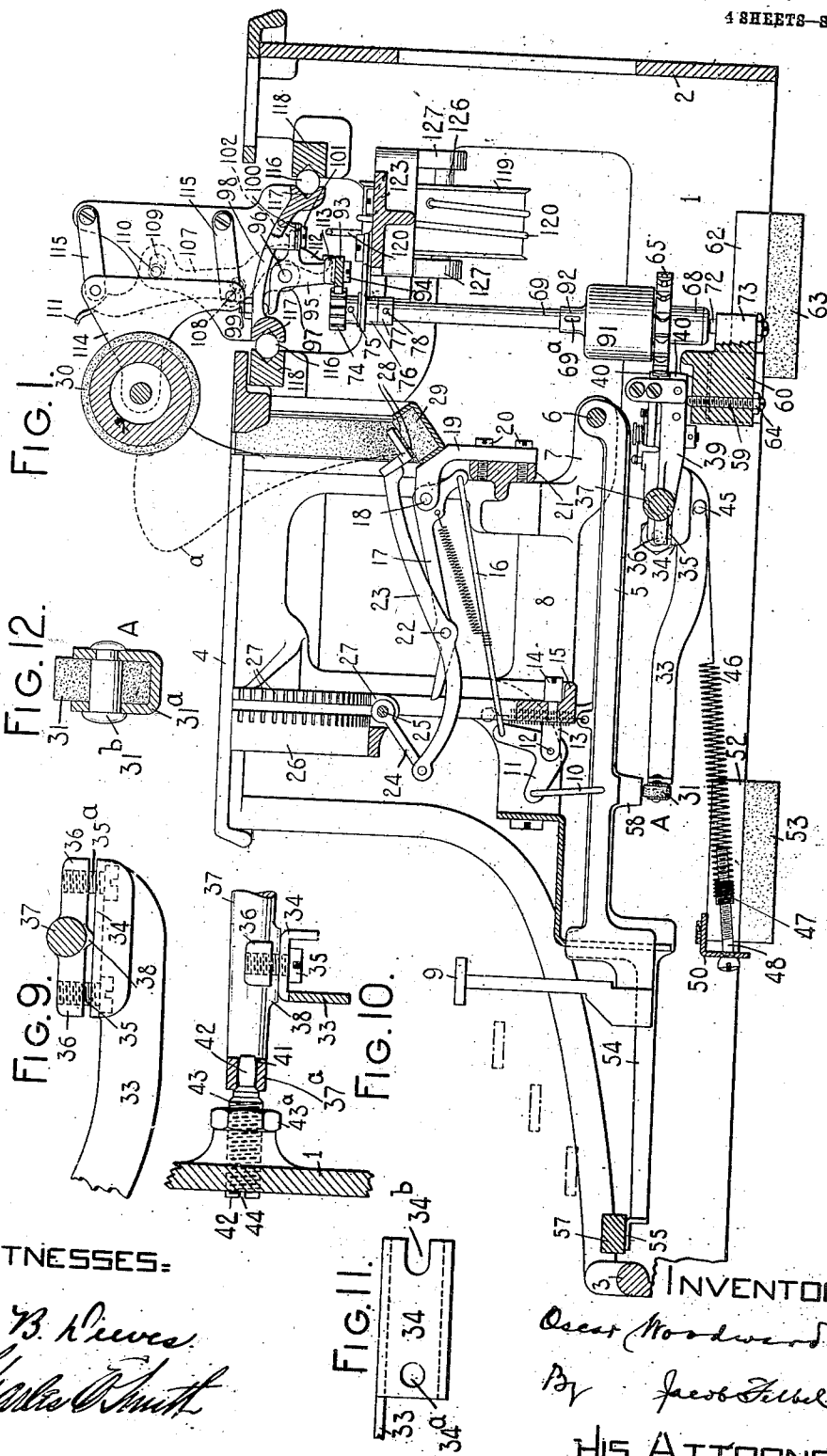


957,288.

O. WOODWARD.
TYPE-WRITING MACHINE.
APPLICATION FILED FEB. 11, 1908.

Patented May 10, 1910.
4 SHEETS—SHEET 1.



WITNESSES:

J. B. Reeves
Charles Smith

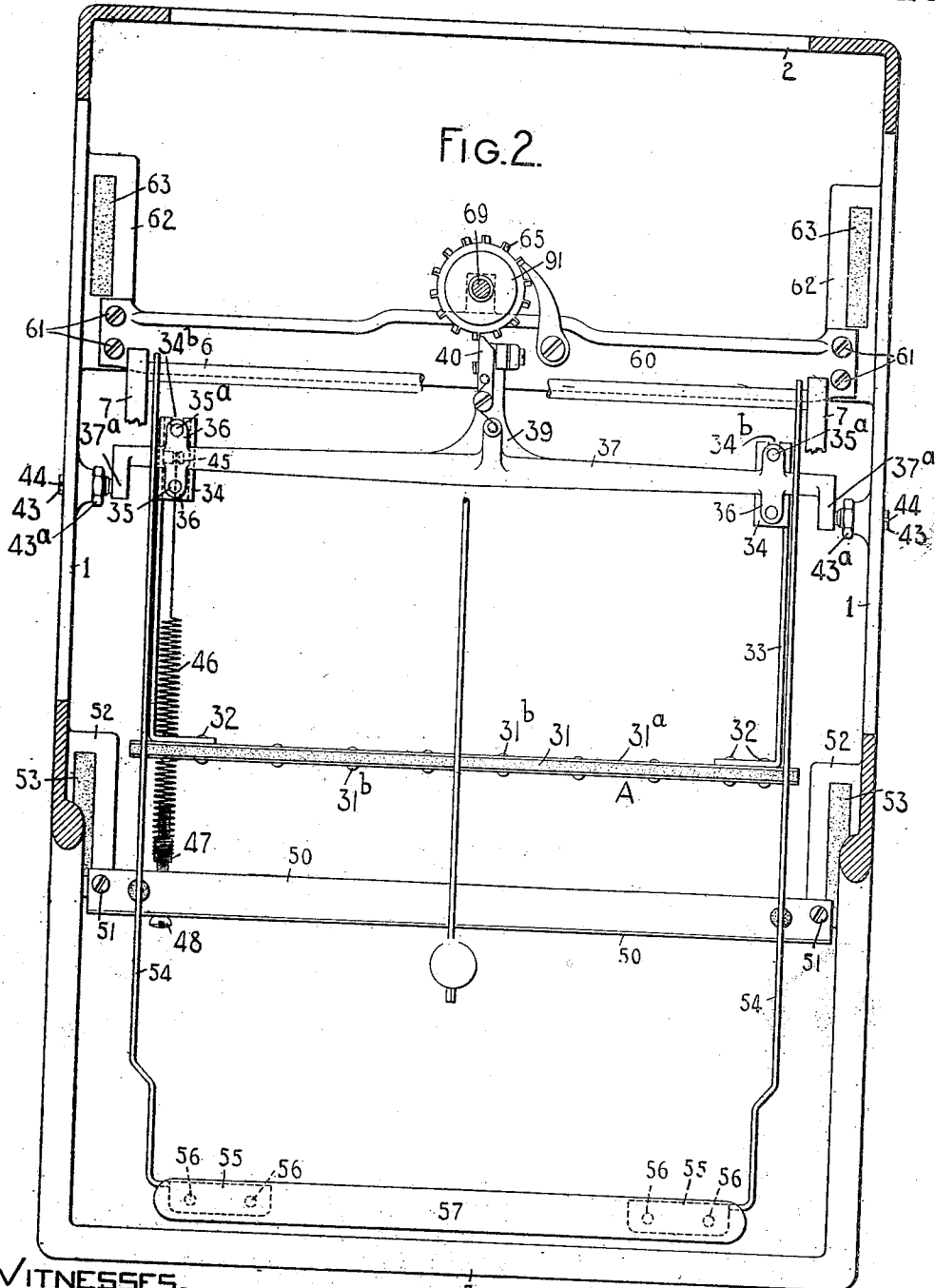
INVENTOR:
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957,288.

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TYPE WRITING MACHINE.
APPLICATION FILED FEB. 11, 1908.

Patented May 10, 1910.

4 SHEETS—SHEET 2.



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Patented May 10, 1910.

4 SHEETS—SHEET 3.

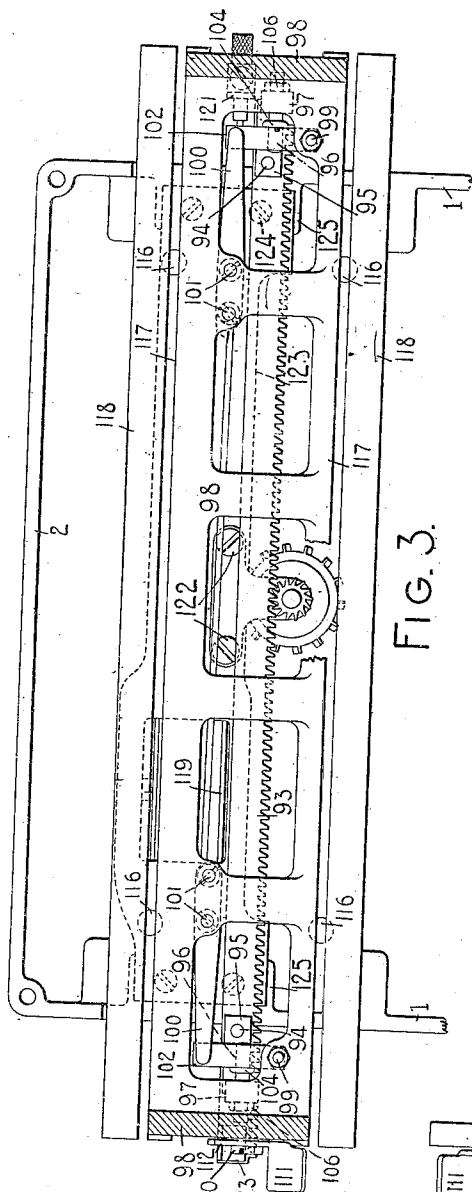


FIG. 3.

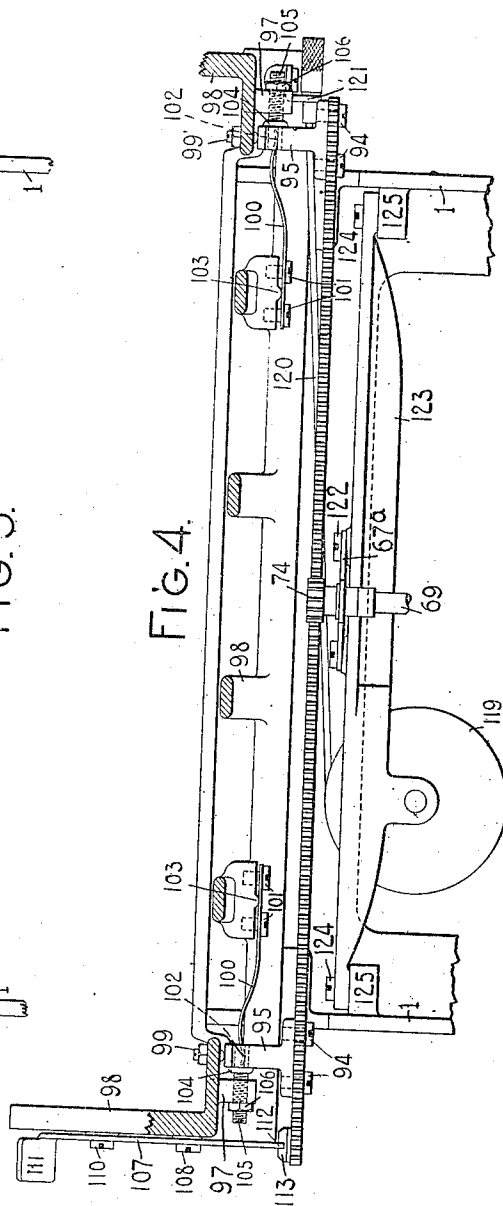


FIG. 4.

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957,288.

Patented May 10, 1910.

4 SHEETS—SHEET 4.

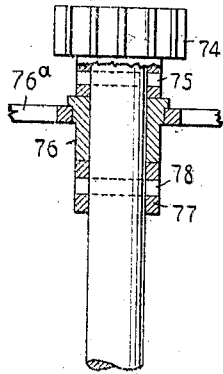
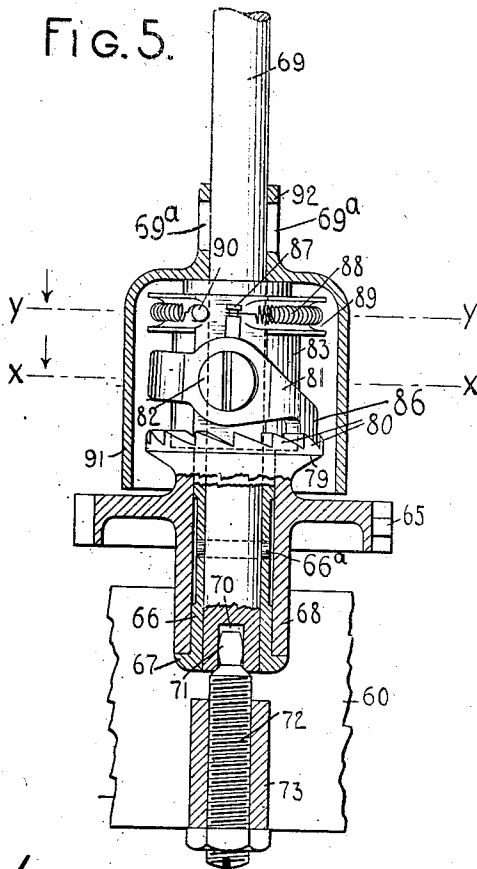


FIG. 5.



WITNESSES:

J. B. Davis
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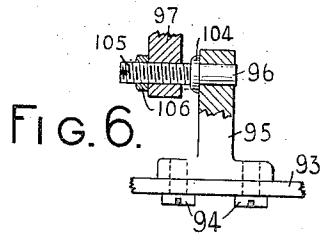


FIG. 6.

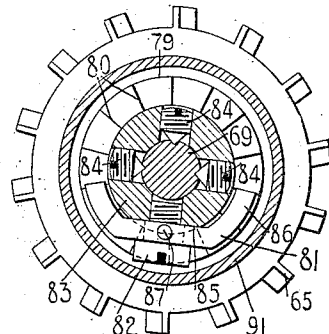


FIG. 7.

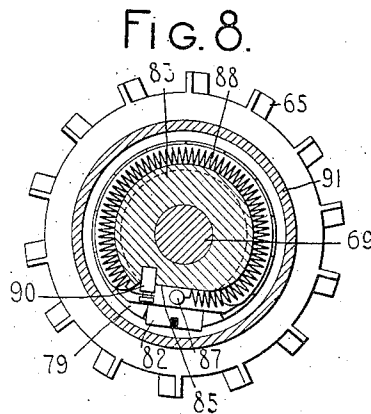


FIG. 8.

INVENTOR:

Oscar Woodward

By Jacob Felber

HIS ATTORNEY

UNITED STATES PATENT OFFICE.

OSCAR WOODWARD, OF MONTCLAIR, NEW JERSEY, ASSIGNOR TO YOST WRITING MACHINE COMPANY, OF ILION, NEW YORK, A CORPORATION OF NEW YORK.

TYPE-WRITING MACHINE.

957,288.

Specification of Letters Patent.

Patented May 10, 1910.

Application filed February 11, 1908. Serial No. 415,373.

To all whom it may concern:

Be it known that I, OSCAR WOODWARD, citizen of the United States, and resident of Montclair, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My invention relates to typewriting machines and more particularly to carriage feed mechanism, and the main object of said invention is to provide simple and efficient mechanism of the character specified.

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

In the accompanying drawings, Figure 1 is a central vertical front to rear sectional view of a typewriting machine embodying my invention, some of the parts being omitted. Fig. 2 is a horizontal sectional view of the same with parts broken away, the section being taken just above the key levers. Fig. 3 is a detail fragmentary plan view, partly in section, of the carriage and some of the associated parts. Fig. 4 is a front elevation of the same with parts broken away and parts in section. Fig. 5 is an enlarged detail front elevation with parts in section of portions of the escapement mechanism. Fig. 6 is an enlarged detail fragmentary front elevation with parts in section showing the pivotal connection between one end of the feed rack and the carriage. Fig. 7 is an enlarged detail transverse sectional view taken through the escapement wheel shaft on the line $x-x$ in Fig. 5 and looking in the direction of the arrow at said line. Fig. 8 is a like view of the same, the section being taken on the line $y-y$ of Fig. 5 and looking in the direction of the arrow at said line. Fig. 9 is an enlarged fragmentary side elevation, partly in section, showing the adjustable and detachable connection between the universal bar and dog rocker. Fig. 10 is a front elevation of the same with parts in section. Fig. 11 is an enlarged detail fragmentary top view showing a part of the adjustable

connection between the universal bar and dog rocker. Fig. 12 is an enlarged detail cross section of the universal bar.

The type action shown and described herein is of the same specific character as that disclosed in the application of George F. Ballou, Serial No. 353,558, filed January 22nd, 1907, and is of the same general character as that disclosed in the application of Arthur W. Smith filed May 15th, 1905, Serial No. 260,441.

The frame of the machine comprises side plates 1, a rear cross plate 2, a front cross plate 3 and a top plate 4. Key levers 5 are pivoted on a pivot rod 6 connected to rearwardly extending arms 7 of an auxiliary frame 8. The forward end of each key lever is provided with a finger key 9. A pull link 10 is connected at its lower end to a key lever 5, the upper end of the link being connected to a forwardly projecting arm of an associated bell crank sub-lever 11 pivoted at 12 to a hanger 13 secured by a nut 14 to a segment 15 which forms part of the auxiliary frame 8. The upwardly extending arm of each sub-lever 11 is pivotally connected to the forward end of a pull link 16, the rear end of said link being connected to a type bar driver 17. Each driver is pivoted at 18 to a hanger 19 secured by screws 20 to a segment 21 which forms part of the auxiliary frame 8. Each driver 17 is pivoted at 22 to a type bar 23. Each type bar is pivoted at its forward end to a guide link 24, the system of guide links being pivoted on a pivot wire 25 received in a groove in a segment 26 forming part of the auxiliary frame 8, each guide working in a radial slot 27 in said segment 26. The types 28 at the rear ends of the type bars normally rest against an inking pad 29 secured to the main frame of the machine. A depression of the finger key 9 causes the lower case type on the associated type bar to follow the path of the dotted line a in Fig. 1 and to impact against the front face of a cylindrical platen 30.

A universal bar A comprises a strip 31 of leather or some such suitable material received in a sheet metal container or bar 31^a substantially U-shaped in cross-section. The leather strip is secured in the container by shouldered rivets 31^b which pass through

openings in the sides of the container and in the leather strip and the shoulder on each rivet bears against the inner face of one of the sides of the container. The container 31^a is riveted or otherwise secured at 32 near each end thereof to a rearwardly extending arm 33 preferably made of sheet metal and having an inwardly bent portion 34 near the rear end thereof. This inwardly bent portion 34 of each arm is apertured at 34^a (Fig. 11) for the free passage of the stem of a headed screw 35 and also has an open slot 34^b for the free passage therethrough of the stem of a headed screw 35^a. These screws are received in tapped openings in arms 36 which project forwardly and rearwardly from a rock shaft 37. The under side of the rock shaft is provided with downwardly extending projections 38 (Figs. 9 and 10), each of which constitutes a fulcrum cooperative with the associated member 34. From an inspection of Fig. 9 it will be seen that the screws 35 and 35^a which connect each of the arms 33 to the rock shaft are on opposite sides of the associated fulcrum or projection 38 and that the loosening of one of the screws and the tightening of the other effects an adjustment of the associated arm 33 relatively to the rock shaft, the adjustment of the arm up or down depending on which screw 35 or 35^a is loosened and which is tightened. After the adjustment is once effected, it need not be disturbed, even when for any reason it may be found necessary or desirable to detach the universal bar from the dog rocker. If, for instance, the universal bar is to be detached, the screws 35 may be removed and the opened slots 34^b will afford a withdrawal of the arms 34 without disturbing the screws 35^a. When the members 34 are replaced and the screws 35 are screwed into place, the universal bar will be secured to the dog rocker in the same position the bar had before its removal. The construction thus affords means for readily removing the universal bar and re-connecting it and for adjusting the arms 33 up or down around the fulcrums 38 and for effecting an up or down adjustment of the universal bar 31 secured to the forward ends thereof, thereby adjusting the universal bar relatively to the key levers 5 without disturbing the escapement mechanism. The means also afford an individual adjustment of the universal bar at opposite ends thereof.

The rock shaft 37 constitutes a dog rocker provided with a rearwardly projecting arm 39 which carries feed dogs 40. The ends of the rock shaft of the dog rocker are off-set as indicated at 37^a (Fig. 2) where they are apertured at 41 (Fig. 10) for the reception of pivots 42 each forming part of a screw 43 received in a tapped opening in a side plate 1 of the machine at its base and pro-

jecting to the outside of the base where it is provided with the slot 44 for cooperation with a screw driver or other suitable tool to effect a longitudinal adjustment of the pivot. A lock nut 43^a cooperates with each screw 43 to hold it in its adjusted position. One of the arms 33 of the universal bar is provided with a laterally projecting pin 45 by which one end of a contractile restoring spring 46 is connected to said arm, the opposite end of the spring receiving a nut 47 threaded exteriorly for cooperation with the convolute of the spring 46 and threaded interiorly for cooperation with the stem of a headed screw 48 which passes freely through an opening in a cross bar 50 secured at its ends by screws 51 to forwardly projecting lugs 52 constituting holders for rubber feet 53 of the machine. The head of the screw 48 is readily accessible to the operator from the front of the machine and may be adjusted with a screw driver to vary the tension of the spring 46. The tension of the spring 46 is exerted to maintain the universal bar in the elevated position, as shown in Fig. 1.

Levers 54 are pivoted on the pivot rod 6 near each side of the machine and are bent inwardly at their forward ends and then forward to provide feet 55 apertured for the reception of screws 56 by which said levers are rigidly connected to a spacing key or bar 57. Each of the levers 54 is provided with a downwardly extending projection 58 which co-acts with the universal bar. The return movement of the dog rocker to normal position is limited by a screw stop 59 received in a tapped opening in a cross bar 60 connected at its ends by screws 61 with lugs 62 which also constitute supports for rubber feet 63 of the machine. A lock nut 64 cooperates with the set screw 59 to maintain it in adjusted position. The rearwardly projecting arm 39 of the dog rocker when in normal position bears against the upper end of the screw, thus limiting its movement in one direction. The feed dogs 40 cooperate with an escapement wheel 65, the hub 68 of which surrounds a sleeve 66 (see Fig. 5), said sleeve having a circumferential flange 67 at the lower end thereof against which the lower end of the hub 68 of the escapement wheel bears. A vertically disposed shaft 69 is secured to the sleeve 66 by a pin 66^a and is apertured at its lower end as at 70 for the reception of a pivot 71 formed on the upper end of a screw 72 received in a tapped opening in a lug 73 which projects rearwardly from the cross bar 60. The upper end of the shaft 69 is provided with a feed pinion 74 secured thereto by a pin 75 which passes through openings in the hub of the feed pinion and through the shaft. The lower end of the hub on the feed pinion bears against the upper end of a flanged sleeve 76 in which the shaft 69 turns and

said sleeve is seated in an opening in a bracket plate 76^a. Below the sleeve 76 is a collar 77 secured to the shaft 69 by a pin 78.

A ratchet wheel 79 is formed integral with the escapement wheel, the teeth 80 of said ratchet wheel extending upwardly. A pawl 81 is pivoted on a shouldered screw 82, threaded into an opening in a sleeve 83 which surrounds the shaft 69 and is secured thereto by screws 84 (Fig. 7) which extend through threaded openings in the sleeve and bear at their inner ends in recesses formed in the shaft 69, thus locking the sleeve to rotate with the shaft. The pawl 81 is segmental in shape and is flattened on one face as at 85 for coöperation with a flattened face at one side of the sleeve. The terminal portions of the pawl are curved as shown in Fig. 7 so that the engaging nose 86 may co-operate with the teeth 80 of the ratchet wheel. A pin 87 projects upwardly from the pawl to provide means by which one end of a contractile spring 88 may be secured to the pawl to force the engaging nose 86 thereof into engagement with the ratchet teeth 80. The spring 88 surrounds the sleeve 83 and is received in a circumferential groove 89 therein, the opposite end of the spring being secured to a pin 90 which projects from the sleeve. A cylindrical housing 91 surrounds the pawl and ratchet mechanism and extends inwardly to form a hub 92 which surrounds the shaft 69 and which is slotted at 69^a to render the hub slightly resilient to exert a binding or frictional engagement with the shaft 69. When the housing 91 is in the normal position it rests upon the upper edge of the sleeve 83 but may be moved up along the shaft 69 to expose the pawl and ratchet mechanism.

From an inspection of Figs. 1 and 4 it will be seen that the feed pinion 74 coöperates with the feed rack 93, connected near its ends by screws 94 with three-arm levers 95 pivoted at 96 to depending lugs 97 which project from a carriage truck 98. The forward arm of each of these levers is adapted to bear against a set screw 99 carried by the truck in order to limit the movement of the feed rack back to normal position. Leaf springs 100 (Fig. 3) are secured by screws 101 to the carriage truck and bear at their free ends on a second set of arms 102 on the levers 95 and tend to force the rack to the normal position where it engages the feed pinion. The third set of arms on the levers 95 are those which are connected to the feed rack. The leaf springs 100 each bears against a projection or fulcrum 103 (Fig. 4) and the screws 101 for each spring are situated on opposite sides of the fulcrum 103. By adjusting the screws 101 the pressure of the springs upon the arms 102 can be nicely regulated and these means provide for individually adjusting the pressure of the

springs at each end of the pivoted rack. The pivotal connection between the feed rack and the truck is shown in Figs. 3 and 4 and is also shown in detail in Fig. 6. From these figures it will be seen that each pivot 96 comprises a pivot portion proper which is received in the bearing opening in the associated lever 95 and a circumferential abutment or collar 104 which bears against the inner face of the lever to prevent a longitudinal movement of the feed rack and the levers 95 connected therewith on the pivot bearings. Each pivot 96 is extended to form a threaded portion 105 which is received in a tapped opening in the associated bearing lug 97 and is provided with a lock nut 106 by which it may be secured in its adjusted position. By turning the screws 105 in their bearing lugs 97, one out and the other in, a longitudinal adjustment of the feed rack may be effected relatively to the truck.

Upon reference to Figs. 1, 3 and 4, it will be seen that a release lever 107 is pivoted to the left-hand end plate of the truck at 108. The release lever is provided with a slot 109 through which a pin 110, projecting from the left-hand end plate of the truck, extends. The upper end of the release lever is provided with a finger piece 111 and the lower end 112 of the release lever engages a projection 113 on the feed rack in order to move the feed rack rearwardly against the tension of its springs 100 when the finger piece 111 is moved forwardly, thereby disengaging the rack from the feed pinion and freeing the carriage from its escapement mechanism.

A platen frame 114 carries the platen 30 and is connected to the truck 98 by parallel links 115 so as to afford case shifting movements of the platen relatively to the truck by suitable case shifting mechanism (not shown). The truck is supported by anti-friction rollers or balls 116 which are received in guide ways 117 formed in the truck and oppositely disposed grooved rails 118 fixed to the frame of the machine. It will be seen that a spring drum 119 is mounted in bearings beneath the carriage and that a cord or band 120 surrounds the drum and is secured thereto at one end, the opposite end of the cord or band being secured at 121 (Figs. 3 and 4) to the truck at the right-hand end thereof and about centrally of the carriage between the carriage rails 118. Referring particularly to Fig. 3, it will be seen that the pull of the spring drum on the carriage is exerted about midway of the carriage considered fore and aft of the machine and about midway between the fixed guide rails 118 on which the carriage is supported. The effect of this connection is to exert a pull on the carriage at a point where the pull is most effective and so

that no appreciable lateral strain is exerted on the bearings for the carriage.

Each actuation of the finger key 9 or the space key 57 is effective to depress the universal bar, thereby actuating the dog rocker to move one of the dogs 40 out of contact with the escapement wheel and to bring the other feed dog into engagement therewith. When pressure is released upon the finger key the parts will be restored to their normal positions and a feed movement of the escapement wheel will be effected through the pressure exerted by the spring drum upon the truck, this pressure being transmitted through the feed rack 93, its actuating pinion 74, escapement wheel shaft 69, pawl 81 and ratchet wheel 79. When the carriage is moved from left to right to begin a new line of writing the shaft 69 is rotated in the opposite direction through the rack 93 and pinion 74, the pawl 81 at this time sliding over the teeth 80 of the ratchet wheel without affecting the escapement wheel. It will be seen that the construction is such that the feed rack is situated beneath the carriage and about midway between the bearings for the carriage so that the pressure exerted by the spring drum upon the carriage it transmitted to the feed pinion 74 in a manner in which it is most effective to actuate the escapement wheel without undue lateral strain being exerted upon the carriage bearings. Furthermore, the construction of the universal bar and dog rocker is such that a direct actuation of the parts is effected by the key levers, the feed dogs in turn acting directly upon the escapement wheel.

The bracket 76^a hereinbefore referred to is secured by screws 122 (Figs. 1, 3 and 4) to a cross bar or bridge piece 123 extending transversely of the machine above the cross bar or bridge piece 60. The bridge piece 123 is secured at its ends by screws 124 to inwardly projecting lugs 125 on the machine frame. By these means rigid and substantial supports are provided for the bearings of the escapement shaft 69 and the parts carried thereby. The cross bar 123 is likewise apertured to receive the spring drum 119 that turns on a pivot 126 supported in lugs 127 extending downwardly from the cross bar 123.

Various changes may be made without departing from the spirit and scope of my invention.

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

1. In a typewriting machine, the combination of a power driven carriage, the power employed to move the carriage being applied intermediate the supports therefor, a feed rack located beneath the carriage about centrally thereof considered fore and aft of the machine, a feed pinion meshing with said

rack, an upright shaft connected with said pinion, an escapement wheel operatively connected with said shaft, and key actuated escapement devices co-acting with said escapement wheel.

2. In a typewriting machine, the combination of a power driven carriage, the power employed to move the carriage being applied intermediate the supports therefor, a feed rack located beneath the carriage about centrally thereof considered fore and aft of the machine, a feed pinion meshing with said rack, an upright shaft connected with said pinion, an escapement wheel operatively connected with said shaft, a substantially horizontally disposed rock shaft, feed dogs carried by said substantially horizontally disposed rock shaft, and a universal bar which is also carried by said rock shaft.

3. In a typewriting machine, the combination of an escapement rack, feed dogs co-acting therewith, a rock shaft which carries said feed dogs, a universal bar, and adjustable means for fixedly connecting the universal bar to said rock shaft, said adjustable means being operative to effect an adjustment of said universal bar relatively to said rock shaft.

4. In a typewriting machine, the combination of an escapement rack, feed dogs co-acting therewith, a rock shaft which carries said feed dogs, a universal bar, adjustable means for fixedly connecting the universal bar to said rock shaft, said adjustable means being operative to effect an adjustment of the universal bar relatively to said rock shaft, and key bearing levers co-acting directly with said universal bar.

5. In a typewriting machine, the combination of an escapement rack, feed dogs co-acting therewith, a rock shaft which carries said feed dogs, a universal bar carried by said rock shaft, and adjustable means for connecting said universal bar with said rock shaft and effecting an adjustment of the universal bar substantially around the pivotal axis of said rock shaft.

6. In a typewriting machine, the combination of a carriage, a feed rack located about centrally beneath the carriage, a feed pinion meshing with said rack, an upright shaft connected with said pinion, an escapement wheel operatively connected with said shaft, a substantially horizontally disposed rock shaft extending transversely of the machine and mounted at its ends in the machine frame, feed dogs carried by said rock shaft, a universal bar carried by said substantially horizontally disposed rock shaft, forwardly projecting arms adjustably connected to said rock shaft, and a universal bar carried by said arms.

7. In a typewriting machine, the combination of a dog rocker, a universal bar, and adjustable means for operatively and de-

tachably connecting the universal bar directly with the dog rocker, said adjustable means fixing the universal bar to move with the dog rocker as a part thereof.

5 8. In a typewriting machine, the combination of a dog rocker, a universal bar, and adjustable means for operatively and detachably connecting the universal bar with the dog rocker, said adjustable means including means for enabling a detachment and re-attachment of the universal bar without destroying the relative adjustment between the universal bar and dog rocker.

10 9. In a typewriting machine, the combination of key levers, an escapement wheel, feed dogs cooperative therewith, a rock shaft which carries said feed dogs, arms adjustably connected to said rock shaft, and a universal bar carried by said arms, whereby an adjustment of said universal bar relatively to the key levers may be effected.

15 10. In a typewriting machine, the combination of key levers, an escapement wheel, feed dogs cooperative therewith, a rock shaft which carries said feed dogs, arms adjustably connected to said rock shaft, and a universal bar carried by said arms, whereby an adjustment of said universal bar relatively to the key levers may be effected, the means for adjustably connecting said arms to the rock shaft including means whereby said arms may be detached from and again attached to the rock shaft without destroying the adjustment between the two.

20 11. In a typewriting machine, the combination of key actuated devices, a dog rocker, a universal bar, arms connected to said universal bar, and adjusting devices connecting said arms to said dog rocker, said adjusting devices comprising a fulcrum for each arm and set screws on opposite sides of each fulcrum, whereby the universal bar may be adjusted relatively to the dog rocker and key actuated devices.

25 12. In a typewriting machine, the combination of key actuated devices, a dog rocker, a universal bar, arms connected to said universal bar, and adjusting devices connecting said arms to said dog rocker, said adjusting devices comprising a fulcrum for each arm and set screws on opposite sides of each fulcrum, certain of said screws passing through open-ended slots in said arms, whereby the universal bar may be adjusted relatively to the dog rocker and key actuated devices, and may be detached and replaced when desired without destroying the adjustment.

30 13. In a typewriting machine, the combination of key actuated devices, a substantially horizontally disposed rock shaft, feed dogs carried by said rock shaft, a universal bar, arms connected to said universal bar, and adjusting devices connecting said arms to said rock shaft, said adjusting devices

comprising a fulcrum for each arm and set screws on opposite sides of each fulcrum, whereby the universal bar may be adjusted relatively to the rock shaft and key actuated devices.

14. In a typewriting machine, the combination of key actuated devices, a substantially horizontally disposed rock shaft, feed dogs carried by said rock shaft, a universal bar, arms connected to said universal bar, and adjusting devices connecting said arms to said rock shaft, said adjusting devices comprising a fulcrum for each arm and set screws on opposite sides of each fulcrum, certain of said screws passing through open-ended slots in said arms, whereby the universal bar may be adjusted relatively to the rock shaft and key actuated devices, and may be detached and replaced when desired without destroying the adjustment.

15. In a front strike typewriting machine, the combination of a power driven carriage, the power employed to move the carriage being applied intermediate the supports therefor, a feed rack carried beneath the carriage about midway between the bearings thereof, a feed pinion meshing with said feed rack, hand-controlled means for throwing the feed rack into and out of mesh with said pinion, a substantially vertically disposed shaft connected with said feed pinion, an escapement wheel operatively connected by a pawl and ratchet with said shaft, feed dogs cooperating with said escapement wheel, and key actuated means cooperating operatively with said feed dogs.

16. In a typewriting machine, the combination of a carriage, a feed rack, three-arm levers or links by which said rack is pivoted to the carriage, a spring bearing on an arm of each of said levers or links, and an adjustable stop between the carriage and another arm of each of said levers or links, the third arm of each lever or link being connected with the feed rack.

17. In a typewriting machine, the combination of key actuated devices; and a universal bar cooperative therewith, said universal bar comprising a sheet metal bar formed to receive a leather strip, a leather contact strip, carried by said sheet metal bar, and rivets which pass through said sheet metal bar and leather strip to connect the two.

18. In a typewriting machine, the combination of key actuated devices, and a universal bar cooperative therewith, said universal bar comprising a sheet metal bar bent into substantially U-shape, a leather strip seated in said metal bar, and rivets which pass through the sides of the metal bar to connect them and to secure the leather strip to the bar.

19. In a typewriting machine, the com-

6
bination of an escapement wheel, a shaft,
pawl and ratchet mechanism for operatively
connecting said escapement wheel and shaft,
a housing surrounding said pawl and ratchet
5 mechanism, and a frictional connection be-
tween said housing and shaft so that the
housing may be moved along the shaft to
expose the pawl and ratchet mechanism, said
frictional connection being formed by a part
10 of the housing itself bearing against the

shaft and holding the housing in place
thereon.

Signed at the borough of Manhattan, city
of New York, in the county of New York
and State of New York, this 10th day of 15
February A. D. 1908.

OSCAR WOODWARD.

Witnesses:

CHARLES E. SMITH,
J. B. DEEVES.