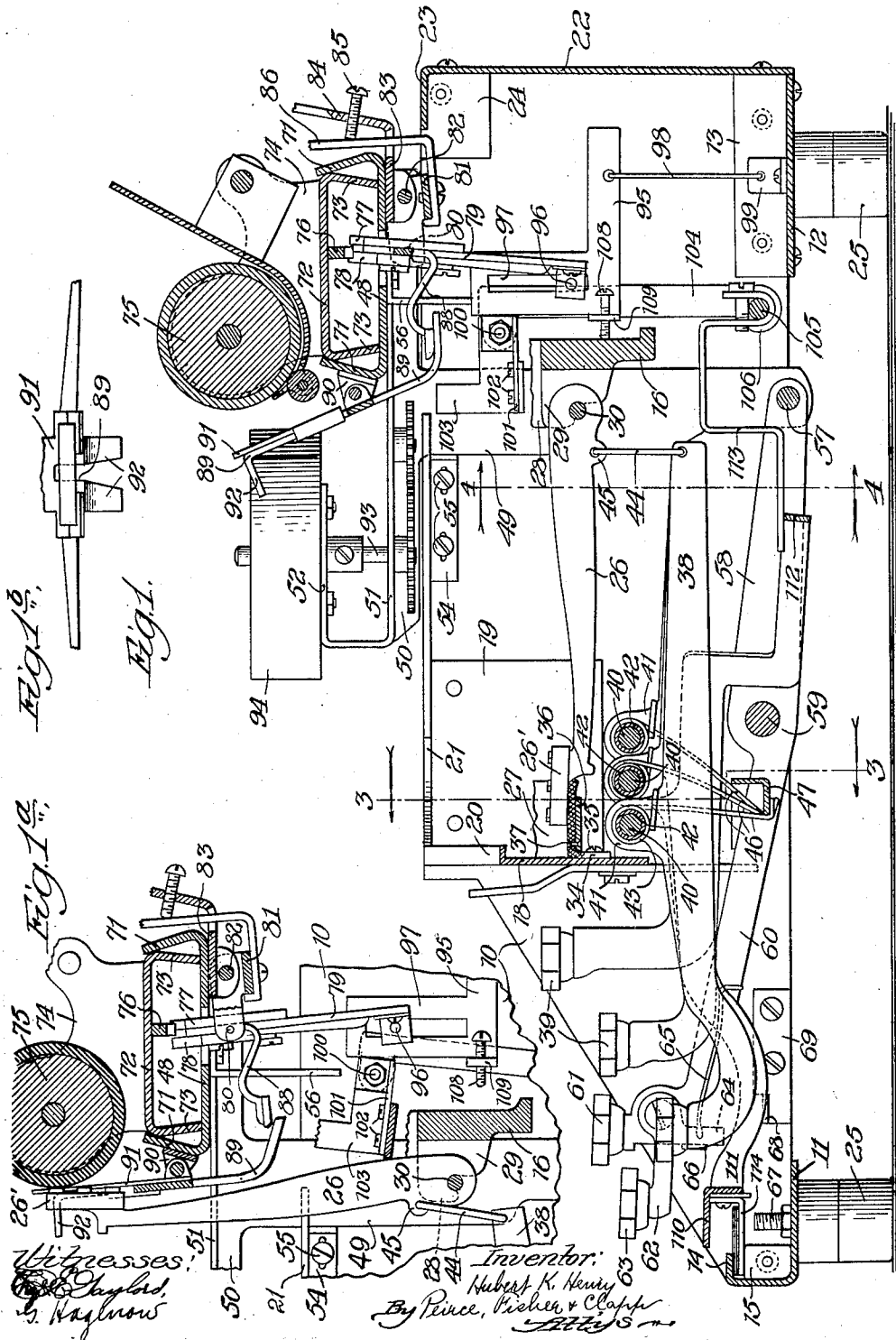


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 APPLICATION FILED JAN. 18, 1918.

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Patented May 25, 1920.

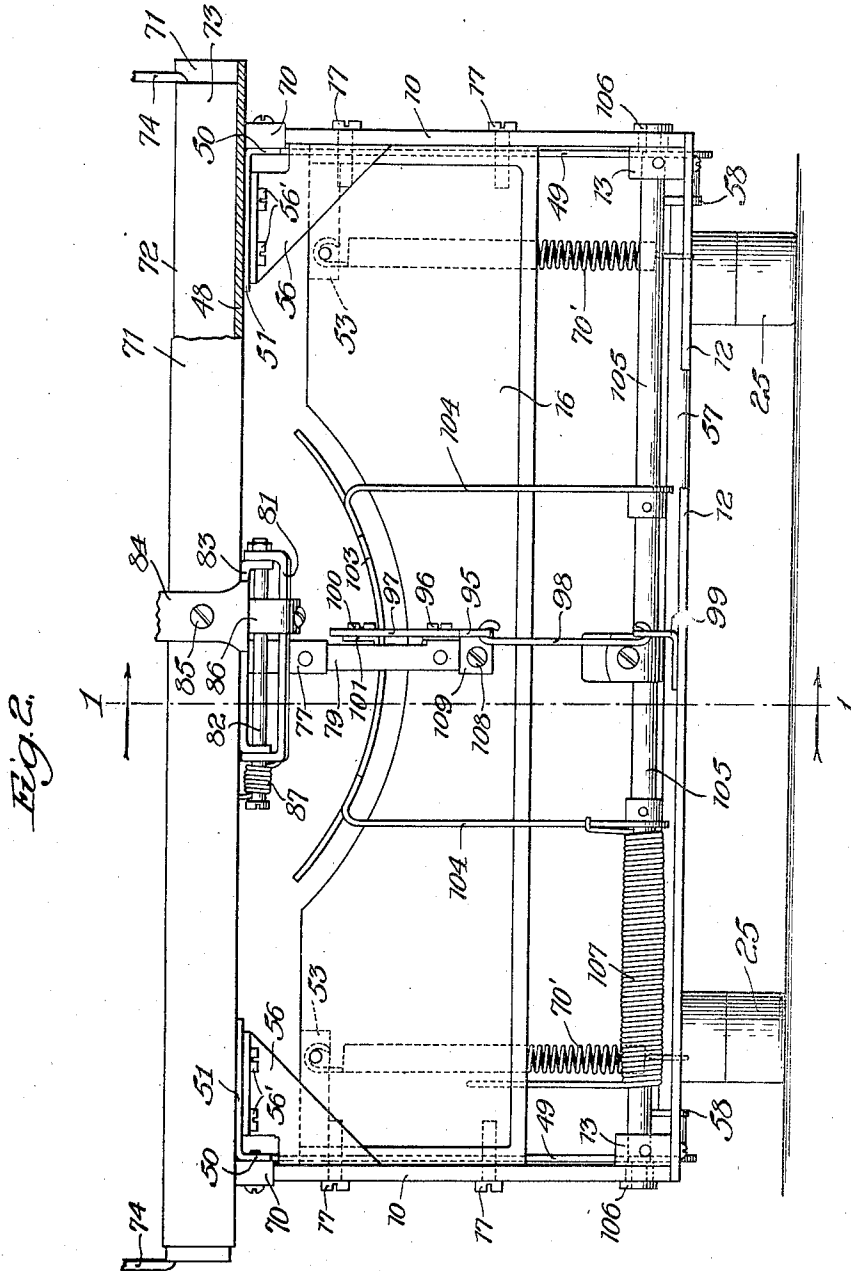
3 SHEETS—SHEET 1.



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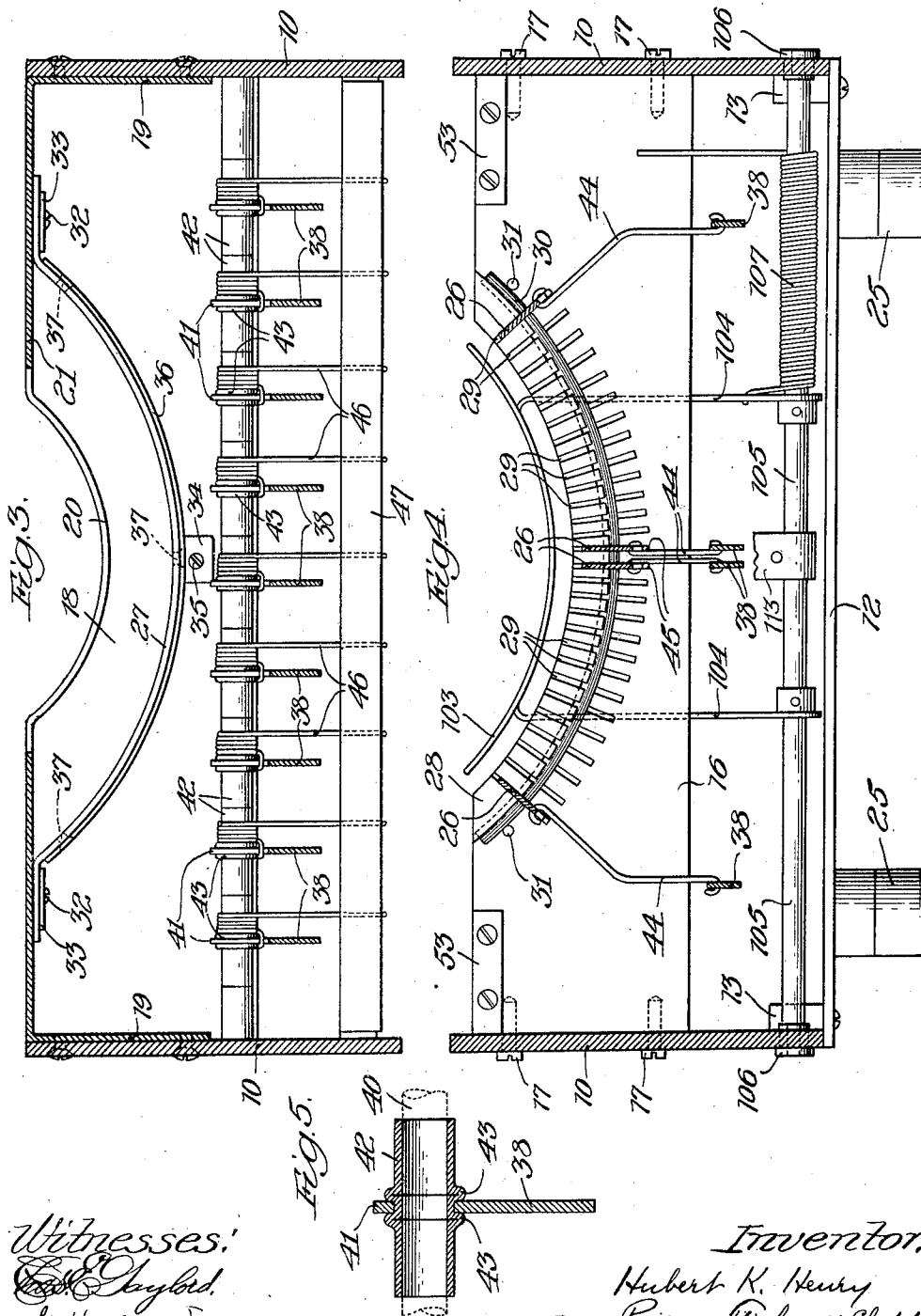
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UNITED STATES PATENT OFFICE.

HUBERT K. HENRY, OF DETROIT, MICHIGAN, ASSIGNOR TO REX TYPEWRITER COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

TYPEWRITING-MACHINE.

1,341,424.

Specification of Letters Patent.

Patented May 25, 1920.

Original application filed February 4, 1915, Serial No. 6,127. Divided and this application filed January 18, 1918. Serial No. 212,443.

To all whom it may concern:

Be it known that I, HUBERT K. HENRY, a citizen of the United States, and a resident of Detroit, county of Wayne, and State of Michigan, have invented certain new and useful Improvements in Typewriting-Machines, of which the following is a specification.

The invention relates to typewriting machines and more particularly to front strike typewriters. The invention seeks to provide an improved front strike typewriter of simple, economical, strong construction and consists in the features of improvement hereinafter set forth, illustrated in the preferred form in the accompanying drawings, and more particularly pointed out in the appended claims.

The present application is a division of an earlier application for patent on improvements in typewriting machines, filed by me in the United States Patent Office February 4, 1915, Serial No. 6,127.

In the drawings, Figure 1 is a longitudinal section of the improved machine, parts being shown in section on the line 1—1 of Fig. 2. Figs. 1^a and 1^b show details of the structure of Fig. 1. Fig. 2 is a rear elevation with the back plate of the machine frame removed and a portion of the carriage bed shown in section. Figs. 3 and 4 are detail cross sections taken on the lines 3—3 and 4—4 respectively of Fig. 1 and illustrating the type bar mechanism, parts being omitted for the sake of clearness. Fig. 5 is a detail section on an enlarged scale of the bearing portion of one of the key levers.

The frame of the machine comprises a pair of side plates 10 preferably formed of sheet steel and having inclined front portions, as most clearly shown in Fig. 1. At the lower front and rear portions of the machine, the side plates 10 are connected by transverse bars or plates 11 and 12 which are suitably secured at their ends to the side plates. In the form shown, the lower rear corners of the side plates and the ends of the transverse bar 12 are secured by screws to corner blocks 13. The front transverse connection 11 is preferably in the form of an angle bar having an inturned flange 14 at its upper edge and being provided at its ends with inturned lugs 15 that are fastened by screws, rivets or the like, to the lower front

end portions of the side plates. Intermediate the front and rear portions of the machine, but nearer the rear thereof, the side plates 10 are connected by a transverse, vertically disposed, type-bar support or segment 16 which is preferably formed of cast metal and to the ends of which the side plates are fastened by screws 17, see Fig. 4. The side plates 10 are also connected at the upper front portion of the machine by a transverse, vertically disposed plate 18 having flanged end portions 19 that are fastened by screws, rivets or the like to the side plates (see Figs. 1 and 3). The central portion of the transverse front portion 18 is depressed and curved, as most clearly shown in Fig. 3, and is provided with an inturned flange 20. Preferably also a top plate 21 is formed in piece with the front plate 18 and the flanges 19, the central portion of this top plate being cut away to form an opening through which the type bars are projected to strike the platen. The rear portion of the machine frame is preferably inclosed by a plate 22 having an inturned flange 23 at its upper edge and removably connected by screws or the like to the lower corner blocks 13 and to upper corner blocks 24, the latter being secured to the upper rear portions of the side plates 10. The parts of the frame described, except the type bar support 16, are all preferably formed of pressed sheet steel. As usual, the frame is mounted upon feet 25 of rubber or the like.

The type bars 26 of the machine are pivotally mounted upon the upper front portion of the transverse support or segment 16, and normally extend forwardly therefrom in horizontal position, the type heads 26' at their forward ends engaging the segmental type bar rest or support 27 (see Figs. 1, 3 and 4). In the preferred construction shown, the type bar support 16 has a substantially horizontal lower edge and an upper edge, the central portion of which is curved and concave as most clearly shown in Fig. 4. The curved portion of the type bar support is provided with a forwardly projecting part or flange 28 having a plurality of guide slots 29 formed therein, one for each of the type bars. These slots are, of course, radial with respect to the printing point of the machine and preferably the

slots are closely adjacent at the center of the type bar segment and farther apart at the ends thereof. The lower front portion of the flange 28 is cut away and the upper projecting portion thereof is provided, on its under side, with a seat for a curved pivot rod 30 that extends through the ends of all of the type bars. Pins 31 projecting from the face of the support 16 extend beneath and engage the ends of the pivot rod and hold it against displacement from its seat.

The type bar rest 27 is formed of a strip of leather, felt or like cushioning material, the ends of which are connected by screws and washers 32 and 33 to the under side of the top plate 21 (see Fig. 3). The central portion of the leather strip is provided with a depending tab 34 which is connected by a screw 35 to the front plate 18. Preferably, in order to maintain the leather strip of proper form, it is provided with a stiffening or backing. This stiffening or backing is preferably in the form of a segmental metal strip 36, which is secured to the flexible strip 27 by a number of rivets 37. The metal strip, however, is not directly connected in any way to the metal frame of the machine and the rest is of such a construction that it absorbs the momentum of the type bars as they return to normal position and prevents them rebounding.

The key levers 38 are arranged in horizontal position beneath the type bars and the up-turned forward ends thereof are provided with keys 39 arranged in three banks, to form a keyboard of the universal type. The key levers are mounted midway between their ends upon a series of three pivot rods 40, the key levers of each bank being mounted upon one of the pivot rods. The latter are supported at their ends in the side plates 10, and, in the form shown, are in horizontal alinement above the key levers. Each of the key levers is provided with an upwardly projecting lug 41 having a bearing sleeve 42 which encircles the corresponding pivot rod 40. The ends of the bearing sleeves abut (see Fig. 3) to hold the type bars in proper spaced relation. The bearing sleeves are preferably formed of short pieces of sheet metal tubing which are upset or crimped in suitable dies to form flanges 43 (see Fig. 5) which snugly engage the opposite faces of the lugs 41 and thereby securely fasten the key levers to the bearing sleeves.

The forward portions of the key levers extend beneath the front transverse plate 18 and the rear ends of the key levers are arranged beneath and slightly in front of the rear pivoted ends of the type bars and are connected thereto by a series of upwardly extending links 44. The set of type bars are narrower than the set of key levers and the rear ends of the outermost key levers are

preferably bent inwardly to a slight extent, and the outermost links 44 are also inwardly offset, as shown in Fig. 4. The upper ends of the links are pivotally engaged with lugs 45 on the type bars 26. In the normal position of the type bars, the pivotal connection between the bars and links is below and in front of the type bar pivot. The printing point of the machine is vertically above the type bar pivot and in striking position the type bar is vertically disposed with the pivot point between it and the link above and in front of the type bar pivot. (See Fig. 1^a.)

The type bars and key levers are adapted to return by gravity to normal position, with the ends of the type bars in engagement with the rest 27, but preferably also light springs are employed which aid in returning the parts of the type bar mechanism to normal position. In the construction shown, light springs 46 are coiled about the bearing sleeves 42 with one end of each spring in engagement with the lug 41 of the key lever. The other end of each spring is extended downwardly and engages a transverse angle bar 47 which extends between and is connected at its ends to the side plates 10.

The type heads 26' carry three sets of type, and the platen and its supporting carriage shift vertically to bring any one set of type into operation. For this purpose the carriage is mounted upon a vertically shifting frame, which comprises a transverse carriage bed or track 48 mounted upon the upper ends of a pair of uprights 49. The uprights 49 are in the form of flat bars of sheet steel having T-heads 50 at their upper ends, which extend from front to rear of the machine and are provided with inturned flanges 51. The carriage bed or track 48 is secured to the rear portions of the flanges 51 on opposite sides of the machine and the forward ends of these flanges are extended upwardly and then rearwardly to form supports 52 for the ribbon spools. The uprights 49 are arranged adjacent the inner faces of the side plates 10 and immediately in front of the type bar support 16, and their upper ends are held between bearing pieces 53 fixed to the support 16 and guides 54. The latter are adjustably secured to the side plates 10 by screws 55, which extend through slots in the guide pieces, and the guide pieces are provided with inturned rear ends which engage the forward edges of the uprights 49 and hold the shifting frame against play in a fore-and-aft direction. A pair of guide shoes 56 (see Figs. 2 and 5) are adjustably secured by screws 56' to the rear portions of the flange 51, extend downwardly therefrom and engage the inner faces of the side plates 10 and thereby prevent transverse horizontal movement of the shifting frame.

The lower ends of the uprights 49 pivotally engage the ends of the rear bar 57 of a

rocking frame mounted in the machine below the rear ends of the key levers 38. The bar 57 is fixed to the rear ends of a pair of rock arms 58, which are securely fastened at their forward ends to a transverse rock shaft 59, which is journaled in suitable bearings in side plates 10. The rock arm 58 at the left-hand side of the machine is provided with a forwardly extending arm 60, the upturned front end of which is provided with a key 61. A short lever 62 having a key 63 at its forward end is pivoted to the front upturned end of the arm 60. The short lever 62, adjacent its rear pivoted end, is provided with a depending arm 64 and a spring 65 interposed between the arm 60 and this arm normally holds the latter against an inturned stop 66 on the forward end of the arm 60. The lever 62 and its arm 64 are arranged to cooperate with a pair of stops to limit the vertical movement of the shifting frame. One of these stops is in the form of a screw 67 adjustably mounted in one end of the cross bar 11. The other stop 68 comprises a lug formed upon a plate 69 fastened to the inner face of the adjacent side plate 10.

The shift frame and parts carried thereby are normally held in the lowermost position shown in the drawings by gravity with two stop pieces 70 fixed to the heads 50 of the up-rights 49, resting upon the upper edges of the side plates 10 as shown in Fig. 2, and, in this position, when the type bars are actuated, the lower case type thereon will be brought to the printing point. For writing "caps," the finger piece 63 is depressed to first shift the lever 62 about its pivot and move its horizontal arm into engagement with the lug 66 on the arm 60, as shown in Fig. 4, so that the further depression of the key lifts the shift frame and carriage support thereby. This shifting movement is limited by the engagement of the arm 64 with the stop lug 68. For writing "figs," the key 61 is depressed and the vertical movement of the carriage is not arrested until the lever 62 engages the stop screw 67.

The carriage track or bed 48 is formed of pressed sheet steel and is provided at its front and rear edges with upturned inwardly inclined flanges 71. The frame of the carriage is also formed of pressed sheet steel and comprises a transverse bar or plate 72 having downturned inwardly inclined flanges 73 at its front and rear edges and upturned end pieces 74 which support the platen 75. The carriage slidably fits within the bed or track 48 with its front and rear edges engaging the upper portions of the guide flanges 74 and with the lower edges of the flanges 73 resting upon the horizontal portion of the bed or track. The carriage is propelled, as usual, by a suitable spring drum (not shown) and its movement is con-

trolled by an escapement comprising a rack 76 fixed to the under side of the horizontal carriage plate 72 and escapement dogs 77 and 78 mounted upon a dog rocker 79. The latter is pivoted as at 80 to the forwardly projecting end portions of a yoke 81 and a horizontal pivot rod 82 connects the yoke to the depending ends of a bracket 83 which is fixed on the under side of the carriage bed or track 48. The bracket 83 has a rearwardly and upwardly projecting part 84 carrying a stop screw 85 and the yoke 81 has a releasing arm 86 fixed thereto which projects upwardly through an opening in the bracket 83 and is adapted to engage the stop screw 85. A spring 87 (see Fig. 2) coiled about the pivot pin 82 holds the escapement in normal position to cooperate with the rack 76 and with the arm 86 engaging the stop screw 85. The escapement dog rocker is provided with a forwardly projecting arm 88 which engages the lower end of a ribbon vibrator 89. The latter is pivoted between its ends upon a bracket 90 fixed to the front guide flange 71 of the carriage bed and carries a ribbon holder 91. The ribbon vibrator is also provided at its upper end with a pair of forwardly projecting prongs 92 which act as a type bar guide. The ribbon spools are mounted in front of the platen on opposite sides of the shift frame upon short vertical shafts 93 and within casings 94 that are mounted on the supports 52. The shift mechanism and escapement mechanism are thus mounted on and moved vertically with the carriage supporting frame. The lower end of the dog rocker is connected to an actuating shifter 95 by a screw 96. The latter extends through a vertically slotted part 97 of the shifter and through a forwardly turned lug on the lower end of the dog rocker. The rear portion of the shifter is connected by a swinging link 98 to a lug 99 on the lower rear cross bar 12. The upper front portion of the shifter is connected by a pivot pin 100 to a coupling member 101 and the latter is adjustably connected by screws 102 to the central portion of a universal bar 103. This bar is of segmental form and extends above the type bar segment in position to be struck by the type bars when the latter are actuated. At points adjacent its ends, the universal bar 103 is connected to the upper, forwardly projecting ends of a pair of arms 104. Preferably, the arms 104 and the universal bar 103 are formed of a single piece of pressed sheet steel. At their lower ends, the arms 104 are fixed to a rock shaft 105, the reduced ends of which are journaled in suitable bearings 106 mounted in the side plates 10. The spring 107 is coiled about the rock shaft 105, engages one of the arms 104 and holds the universal bar and the shifter 95 in normal position with a stop

screw 108 engaging the rear face of the type bar support 16. This stop screw is adjustably threaded through a lug 109 on the shifter.

5 The universal bar and shifter 95 are thus actuated by the key levers and type bars to operate the dog rocker 78 and parts actuated thereby. The pin and slot connection between the dog rocker and the actuating
10 shifter 95 permits the vertical shift of the dog rocker with the carriage supporting frame. The arrangement of the universal bar over the type bar segment acts as a dust shield therefor. A space bar 110 is arranged at the lower front portion of the
15 keyboard. This space bar is angular in cross section and is connected at its ends to a pair of levers 111 which are hung on the front pivot rod 40. The rear ends of the levers 111 are connected by an integral cross bar 112 which extends beneath the forward end of an arm 113. The latter is bent upwardly, as shown so that it will not interfere with the vertical movement of the
20 rod 57 and its forward end rests upon the cross bar 112. The space bar is held in normal position with a stop lug 114 thereon extending beneath the flange 14 of the front cross bar 11 of the machine frame. When
25 the space bar is depressed, the shaft 105 and arms 104 are oscillated to operate the escapement dog rocker.

Most of the parts can be cheaply formed by suitable dies from sheet steel. The key
35 levers and type bars are compactly arranged and the latter are mounted in substantial bearings on the comparatively heavy cast iron type bar segment or supporting plate. The latter is rigidly secured to the side
40 plates 10 at points closely adjacent the portions of the side plates that guide the vertically moving carriage frame so that these portions of the side plates are strengthened by the type bar segment and accurate alignment of the written matter is effected in
45 the different adjusted positions of the vertically shifted carriage.

It should be noted that the arm 88 on the dog rocker slidably engages the rearwardly bent lower end of the ribbon vibrator and type bar guide 89 and has a camming
50 action thereon. The arrangement is such that the type bar guide is quickly shifted and is held in shifted position when one of the type bars engages the universal bar and oscillates the dog rocker, and, since the type bars engage the universal bar before the type reach the printing point, the type bar
55 guide is held stationary while the type heads are in engagement with the prongs 92 thereof. Hence, the pivoted type bar guide does not catch or interfere with the proper operation of the type bars.

Obviously, changes may be made in the
65 details set forth without departure from the

essentials of the invention as defined in the claims.

I claim as my invention:—

1. In a front-strike typewriter, the combination with the frame, of a type-bar segment mounted in said frame, type-bars pivoted on said segment and normally extending forwardly therefrom in horizontal position, key levers for operating said type-bars and a rest for the forward ends of said
70 type-bars comprising a strip of flexible material fixed at its ends to said frame and a segmental, stiff backing secured to said strip and solely supported thereby, substantially as described. 75

2. In a typewriting machine, the combination with the frame and pivoted type-bars, of a series of key levers for operating said type-bars, having keys at their forward ends arranged in banks; a series of horizontal pivot rods mounted in the frame, said
80 keys having centrally pivoted lugs through which said pivot rods extend, and abutting, bearing and spacing sleeves for said type-bars mounted on said rods and each having
85 two central integral flanges gripping the lug of the corresponding key lever, substantially as described. 90

3. In a front-strike typewriter, a frame comprising sheet metal side plates, front
95 and rear transverse members, connecting said side plates, a transverse, vertically disposed, rigid type bar support substantially rectangular in outline connected to said side plates adjacent its upper and lower edges
100 and having an integral, forwardly projecting slotted segment at its upper front portion, type bars pivoted in the slots of said segment and projecting forwardly therefrom, substantially horizontal key levers
105 pivotally mounted below said type bars and links connecting the said key levers to said type bars, substantially as described.

4. In a front-strike typewriter, a frame comprising sheet metal side plates, front
110 and rear transverse members connecting said side plates, a transverse, vertically disposed, rigid type bar support of cast metal connecting said side plates, said type bar support being substantially rectangular in outline and
115 having an integral, forwardly projecting slotted segment at its upper front portion, type bars pivoted in the slots of said segment and projecting forwardly therefrom, key levers pivoted in the machine frame below said type bars and operatively connected thereto and a segmental universal bar arranged above said slotted type bar segment and arranged to be engaged by said type
120 bars. 125

5. In a front-strike typewriter, the combination with a series of upwardly and rearwardly striking type bars, a transverse, vertically disposed type bar support having an
130 integral, forwardly projecting flange or seg-

ment provided with slots for receiving the rear ends of said type bars, a segmental pivot rod for said type bars, said slotted flange or segment having a seat on its under side for said pivot rod and horizontal, forwardly projecting pins fixed to said segment and extending beneath the ends of said pivot rod to hold the same in position.

6. In a front strike typewriter, a frame comprising side plates, a vertically disposed, rigid type bar support connecting said side plates in front of the rear of said frame, a carriage and carriage bed mounted on said frame above and in rear of said type

bar support, a segmental series of type bars pivotally mounted on the upper front portion of said support and normally projecting forwardly therefrom in horizontal position, a series of key levers pivotally mounted intermediate their ends below said type bars, links directly connecting the rear ends of said key levers and said type bars, a segmental universal bar arranged above said type bar pivots and arranged to be actuated by said type bars, and pivoted arms arranged in rear of said type bar support for supporting said universal bar.

HUBERT K. HENRY.