May 10, 1932. W. A. DOBSON 1,858,041

TYPEWRITING MACHINE

Filed Nov. 28, 1925 2 Sheets-Sheet 1

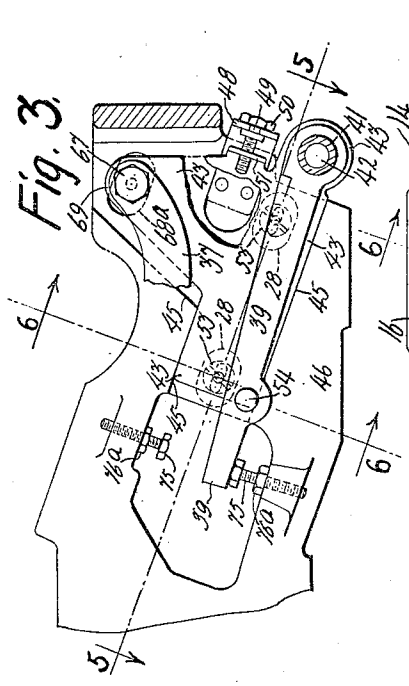

Fig. 3.

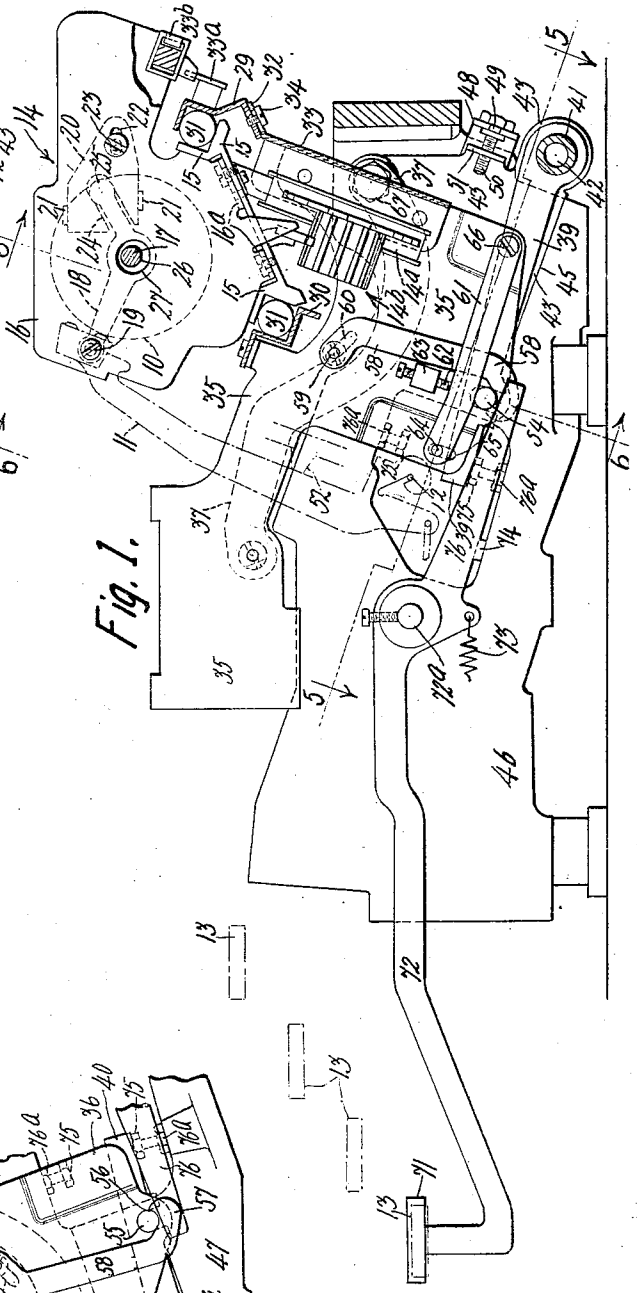

Fig. 1.

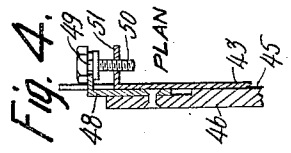

Fig. 4.

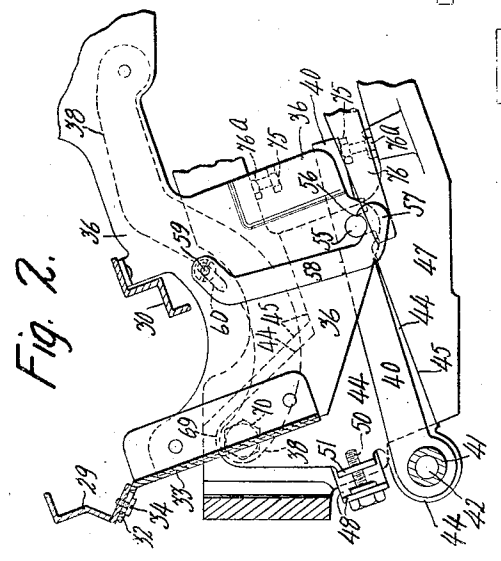

Fig. 2.

Inventor:
William A. Dobson
by Ob Steckney
Attorney

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Fig. 5.

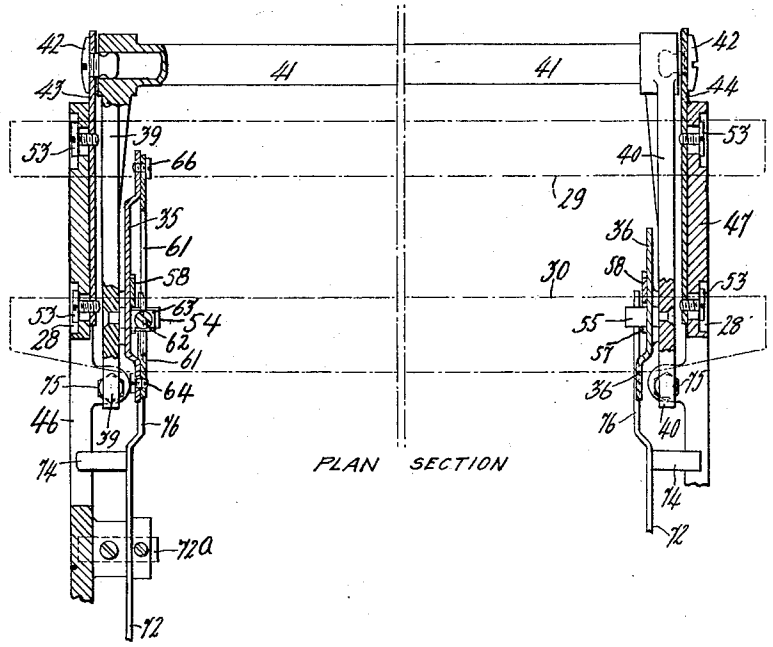


Fig. 6.

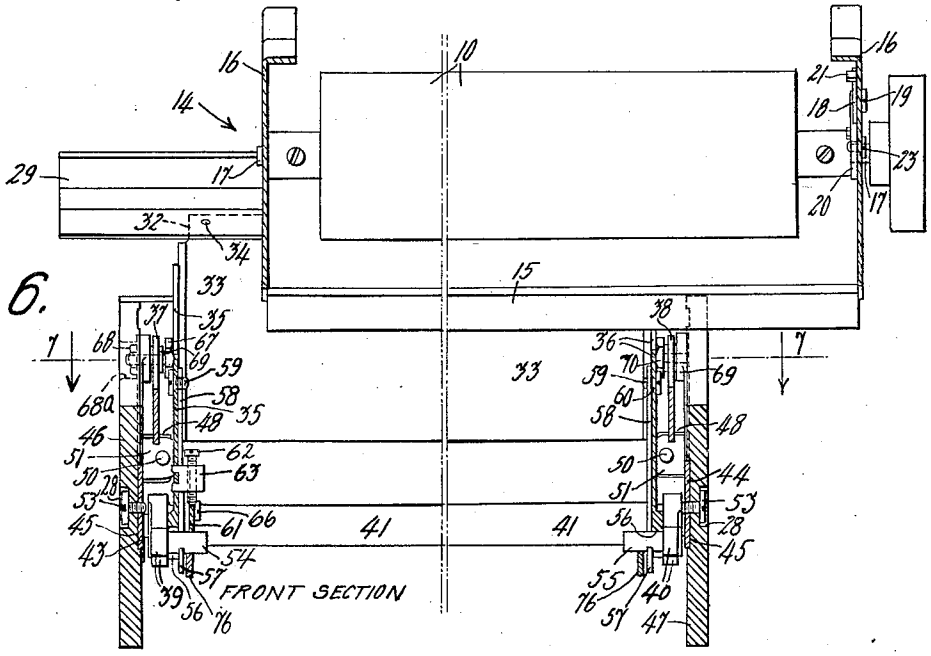
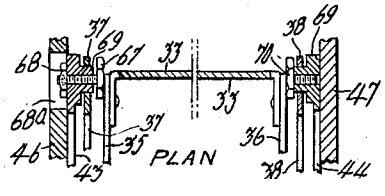


Fig. 7.



Inventor:
William A Dobson
by B. b. Stickney
Attorney

Patented May 10, 1932 1,858,041

UNITED STATES PATENT OFFICE

WILLIAM A. DOBSON, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR TO UNDERWOOD ELLIOTT FISHER COMPANY, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE

TYPEWRITING MACHINE

Application filed November 28, 1925. Serial No. 71,876.

This invention relates to typewriting machines, and particularly to means for adjusting the work platen and its supporting elements, so that uniform impressions and alignment of the type may be obtained along the whole printing line on said platen. Said means for adjustments are so designed that the necessary adjustments may be easily and positively made and secured against disturbance. Easy accessibility and sensitiveness of the adjusting means are other features of this invention.

The invention and its features, as herein described and illustrated, are applied to a portable style typewriting machine having a shiftable platen operatively connected to case-shift keys.

The use of a typewriter as a portable machine renders its adjustments liable to displacement, and for this reason simple and easily accessible means are provided to correct and maintain the adjustments herein described.

The provisions of this invention include means for adjusting the platen parallel to the carriage-rails, means for adjusting the carriage-rails for a running fit of the carriage thereon, means for adjusting the shiftable carriage-frame, with the rails parallel to the typewriter base and also in such manner as to control the type-impressions along the whole length of the platen, and means for taking up the end thrust and end play of the carriage-frame.

The platen-axle adjustment is effected by means of a lever mounted on the side of the platen-frame at one end of the platen.

The two carriage-rails are of the construction usual in typewriters. Upon them is supported a carriage having end plates between which the platen is revolubly mounted, said plates connected by a grooved roller-bearing bar which co-acts with said rails to guide the carriage.

The bearing for one end of the platen is fixed in one of the end plates, and the platen is adjusted for parallelism to the carriage-rails by means of a lever on the inner side of the other end plate. Said lever has a bearing hole for the platen and is actuated by a cam-slide, which is secured after adjustment by means of a clamp-screw. The head of said screw projects through the end plate and is easily accessible. When said screw is loosened the cam-slide may be easily manipulated thereby. The cam-slide and lever are disposed to shift the bearing hole in a direction parallel to the face of the type when printing.

This adjustment in one direction only does not suffice in all cases to bring the platen parallel to the carriage-rails, so it is provided that the end plates between which the platen is mounted may be shifted on their supporting surfaces on the inner bar in a direction substantially oblique to the direction of adjustment obtained by means of the lever. It will be understood that the amount of adjustment required in any direction is relatively small, being just enough to compensate for variations in the end plates, due to the manufacturing tolerances.

The outer carriage-rails are adjusted to the inner bar and the rollers by shifting one of said outer rails. When said outer rail has been adjusted it is clamped to the ledge upon which it is supported by a suitable number of screws. The outer carriage-rails are a part of the shiftable carriage-frame structure, and, in order to bring said rails parallel to the base of the typewriter, the shiftable carriage-frame must be properly adjusted upon its supporting frame.

For adjusting the shiftable carriage-frame parallel to the base of the typewriter, one side of said shiftable carriage-frame is arranged to be raised or lowered with respect to the lower frame whereon it is swung. Upon one of the studs projecting from said frame, the adjustable side of the shiftable car-

riage-frame is supported at its lower edge by means of a notch, the sides of which fit the stud, but the top of said notch is clear of said stud. An adjustable bar spans the notch, so that the lower edge of said bar rests upon the stud and forms a bearing thereon. Said bar is pivoted and clamped to the side of the shiftable carriage-frame, and as said bar is shifted up or down, the side of said shiftable carriage-frame is lowered or raised. The adjustment is facilitated by means of a screw mounted in the shiftable carriage-frame and whose end abuts against the upper edge of the adjustable bar. An adjustable hook-shaped member clamped to the side of the shiftable carriage-frame closes the open end of the notch and completes the bearing around the stud. The other side of the shiftable carriage-frame is similarly supported, but there is no adjustment, the top of the notch resting directly upon the stud.

Each side of the shiftable carriage-frame is swung upon two arms pivoted to an adjustable plate mounted on the inner side of the typewriter-frame. A suitable adjusting screw connection between the typewriter side frame and the adjustable plate is provided at each side, and the plate itself is guided in a direction perpendicular to the printing line on the platen. By this means the shiftable carriage-frame is adjusted, so that the entire printing line on the platen coincides with the normal printing point of the type-bars; thus securing uniform impressions of the type along said line. It will be understood that the printing movement of the type-bars is limited by the usual stop. This adjustment is secured by screws which clamp the adjustable plates to the typewriter side frames.

The shiftable carriage-frame is guided in its case-shift movements, between the heads of screws placed opposite each other and mounted in hubs which are a part of the adjustable plates previously mentioned. Of said screws, the left one is adjustable, so that the space in which the shiftable carriage-frame is constrained to move may be closely regulated and thereby insure even spacing of the letters by eliminating end play. The heads of these screws also take up the end thrusts of the shiftable carriage-frame, it being understood that the letter-feed mechanism and margin-stops are mounted on the shiftable carriage-frame.

The case-shift movements of the shiftable carriage-frame are limited by adjustable screw-stops mounted in each typewriter side frame. These screw-stops arrest the lower arms upon which the shiftable carriage-frame is swung, and which arms are extensions of a pivoted frame actuated by either of two case-shift keys—one on each side of the keyboard.

This invention resides mainly in the provision of all the adjusting means and features herein described, which form a complete combination by means of which extreme flexibility of adjustment of the platen and its supporting elements is attained.

It will be understood, however, that one or more of said adjusting means may, to advantage, be used alone, the others being omitted, and that such separate and independent use of one or more of said adjusting means is within the scope of this invention.

Other features and advantages will hereinafter appear.

In the accompanying drawings,

Figure 1 is a cross-sectional view of a portable typewriter, showing only such parts as are necessary to illustrate the invention. In this view the carriage itself is partly cross-sectioned.

Figure 2 is a fragmentary sectional view, looking from the center toward the right side of the typewriter, and showing part of the shiftable carriage-frame.

Figure 3 is a fragmentary sectional view, looking from the center toward the left side of the typewriter, and showing one of the plates from which the shiftable carriage-frame is swung.

Figure 4 is a detail plan view of one of the means for adjusting the carriage-frame.

Figure 5 is a sectional plan view indicated by line 5—5 in Figures 1 and 3.

Figure 6 is a sectional front view indicated by line 6—6 in Figures 1 and 3.

Figure 7 is a detail sectional plan view of the adjusting means for taking up the end thrust and end play of the carriage-frame. This view is indicated by line 7—7 of Figure 6.

In the typewriter to which this invention is applied 10 is a platen around which a work-sheet, not shown, may be fed. A type-bar 11, swung about a fulcrum 12, prints through a ribbon, not shown, upon said work-sheet. Said type-bar 11 is actuated by one of keys 13 by means of suitable linkage, not shown. A platen-carriage 14 is actuated in a letter-feed movement by a spring-drum 14^a and escapement mechanism and connections 14^b.

The platen 10 is revolubly mounted in the carriage 14, which consists of an inner bar 15 and end plates 16. Said end plates have inwardly-bent tabs 16^a with elongated screw-holes, and are adjustably fastened to, and solidly supported upon, said inner bar. The spindle 17 of the platen has a fixed bearing in the left end plate, and an adjustable bearing for the right end of the spindle. Said adjustable bearing, which is a feature of this invention, is in the form of a lever 18 pivoted at 19 against the inner side of the right end plate. Sensitive adjustment of said lever is obtained by means of a plate 20, slidably mounted adjacent said lever 18. Said plate 20 is guided in a forward and

rearward direction by closely fitting projections 21 from the inner side of the end plate, and the slot 22 in the end plate, through which passes the easily accessible clamp-screw 23. A close fitting slot 24 engages the rounded end 25 of the lever 18. As the plate 20 is moved forwardly or rearwardly, the bearing hole 26 is shifted in a direction substantially parallel to the face of the type when it prints. The hole 27 in the right end plate is enlarged to clear the spindle 17. By means of this adjustment, which is secured by the clamp-screw 23, and the shiftable position of the end plates upon the inner bar 15, the platen may be adjusted parallel to the carriage-rails. This adjustment compensates for any irregularity in the end plates, due the manufacturing tolerances.

Another feature of this invention is the easily accessible means for taking up play between the carriage and its bearings. Said bearings consist of a rear rail 29, a front rail 30 and rollers 31, upon which the carriage 14 rides. The rear rail 29 is shiftably mounted upon a ledge 32 of a cross-bar 33, thus providing means for adjusting the space between the rails 29 and 30. The adjustment is secured by a suitable number of clamp-screws 34, which pass through elongated holes in the ledge 32, and are threaded into the rear rail 29. Said screws 34 are easily accessible.

For shifting the platen-carriage 14 from lower-case to upper-case position, said platen-carriage is mounted in a shiftable carriage-frame, consisting of end plates 35 and 36, connected by means of the carriage-rail 30 and the cross-bar 33, and including an abutment 33^a for the adjustable margin-stops 33^b. Said carriage-frame is swung upon two upper arms 37, 38 and two lower arms 39, 40, one of each at each end of the carriage-frame. Said arms are arranged to give the platen a linear motion substantially parallel to the face of the type when printing. As will be seen in the drawings, one end of each of said arms is pivoted to the carriage-frame, and the other ends are pivoted and fixed externally to the carriage-frame. The lower arms 39 and 40 are rigidly connected by a cross-bar 41, forming a frame which is pivotally supported by trunnion-screws 42 (see Figure 5), threaded into plates 43 and 44, which also carry fixed pivots for the upper arms 37 and 38. Said plates 43 and 44, being adjustable in a direction perpendicular to the face of the type when printing, constitute another feature of this invention. For this purpose, said plates 43 and 44 are guided by the closely-fitting sides 45 of depressions machined in the typewriter side frames 46, 47, and are easily and sensitively adjusted by means illustrated in detail in Figure 4. Said means include a plate 48 riveted to each typewriter side frame and having a right-angle bend, slotted to engage a groove 49 in the head of an adjusting screw 50, which is threaded into tabs 51, projecting from the carriage-frame side plates 43 and 44. The type-bars are limited in their movement by hitting a stop-ring at 52 (see Figure 1). For this reason it is necessary to bring the printing line on the platen up to, and parallel to, the plane in which the face of the type normally strikes. By means of the last adjustment described, this is easily done, the adjusting screws 50 being readily accessible, and this adjustment is secured by clamp-screws 53, which pass through elongated holes 28 in the typewriter side frames.

The carriage-frame is pivoted to the lower arms 39 and 40 upon studs 54 and 55 projecting from said lower arms. The notch 56 in the right side of the carriage-frame (see Figure 2) engages the pivot stud 55, forming a closed bearing thereon in conjunction with the hook-shaped extremity 57 of the member 58. Said member 58 is adjustably clamped to the carriage-frame side plate by a screw 59, which passes through an inclined slot 60 in the carriage-frame side plate. The inclination of slot 60 to the sides of the notch 56 facilitates the adjustment of the member 58 to the pivot 55.

A similar bearing upon the pivot 54 is provided for the left side of the carriage-frame (see Figure 1). Instead, however, of the top of the notch bearing upon the pivot, the edge of a bar 61 is interposed and serves as one side of the bearing. Said bar is adjustable by means of a screw 62 threaded through a block 63 projecting from the left side plate 35 of the carriage-frame. The adjustment is secured by means of a clamp-screw 64 passing through an elongated hole 65 in the carriage-frame and threaded into the bar 61. The bar 61 is pivoted upon a stud 66 screwed into side frame 35. Shifting the bar 61 and the related hook-shaped member 58 displaces the bearing formed thereby, and has the effect of raising or lowering that side of the carriage-frame with respect to the pivot 54. By this means the carriage-rails are adjusted parallel to the base of the typewriter, so that said carriage-rails are not inclined to said base.

Another feature of this invention is illustrated in detail in Figure 7 and is the adjustable abutting screw 67. The reactions of the jolting impulses, due to the letter-feeding movement of the carriage, are taken up by the head of this screw, thus avoiding strain of the carriage-frame. The adjustment is secured by a lock-nut 68, for which a clearance hole 68^a in the side frame 46 is provided. Said screw 67 is threaded into a hub 69 of the plate 43. Similarly on the right side the carriage-frame is retained and guided by the head of a screw 70, which need not be adjustable. The screws 67 and 70 also take up the reactions due to margin-

stopping, particularly screw 70, which takes up the sharp reaction when the carriage is returned against the right margin-stop. The adjustment of the screw 67 also takes up end play of the carriage-frame, thus insuring even spacing of the typing. The hubs 69 also serve as fixed pivots for the upper arms 37 and 38, said arms being retained by the heads of the screws 67 and 70. For manually shifting the platen, a case-shift-key 71 and a lever 72 are provided on each side of the keyboard. Said levers 72 are fulcrumed on studs 72ª, so that depression of a key 71 causes an arm 76 to rise and engage the shiftable carriage-frame structure at the studs 54 or 55. The case-shift levers are retracted by springs 73 until stopped by projections 74 from the sides of said levers striking the edge of an opening in the side frame. The upward and downward movements of the carriage-shift-frame are limited by adjustable screw-stops 75 threaded into suitable bosses in the right and left side frames. As will be seen in the drawings, said screw-stops limit the movement of the lower arms 39 and 40, and consequently the movement of the carriage-frame. The screw-stops are secured by lock-nuts 76ª, and it will be noted that they are easily accessible.

The lower arms 39 are seen at Figure 3 to extend forward considerably beyond the pivots 54, and to rest upon adjustable stops which support the shift-frame and carriage in normal position. The upward movement is arrested by engagement of the forward extensions with the upper adjustable stops 75. The forward lengthening of the arms 39 affords a closer adjustment, so as to bring the capital letters into better alignment with the lower-case letters on the work-sheet. At the same time clearance is afforded, and the adjustable stops 75 are rendered accessible, since they are altogether in front of the shift-frame and clear thereof, and they are easily adjusted.

Variations may be resorted to within the scope of the invention, and portions of the improvements may be used without others.

Having thus described my invention, I claim:

1. In a typewriting machine, the combination with a revoluble platen, a platen-carriage, and rails for guiding said carriage in its letter-feed movement, of adjustable means for relatively truing said platen for parallelism to said rails, said means including adjustable devices for shifting and securing the bearing of one end of the platen, the other end of said platen being in a fixed bearing.

2. In a typewriting machine, the combination with a revoluble platen and a platen-carriage consisting of end plates shiftably mounted upon a bar guided by rails, of means for relatively truing the platen for parallelism to said rails, said truing means including a platen-adjusting lever at one end of the platen, a cam-slide upon said platen-carriage for shifting said lever, means for securing the cam-slide after adjustment, and means for shifting and securing one or both end plates, the means for shifting said end plates being cooperative with the means for shifting said lever to obtain platen adjustment in any required direction.

3. In a typewriting machine, the combination with a revoluble platen and a platen-carriage consisting of ends upstanding from a bar guided by rails, of means for truing the platen for parallelism to said rails, said truing means including a lever at one end of the platen-carriage, an adjacent cam-slide for adjusting said lever, and a screw for securing said cam-slide for adjustment, the head of said screw projecting outside the platen-carriage so that said cam-slide may be manipulated by said head when said screw is loosened.

4. In a typewriting machine, the combination with a machine-frame, a revoluble platen, type-bars of limited printing movement, and a platen-carriage mounted in a shiftable frame, of type-impression-controlling means consisting of shiftable members upon which said shiftable frame is mounted, said members being adjustably secured to the machine-frame and guided therein, and easily accessible adjusting connections between said members and the machine-frame, whereby said members and consequently the shiftable frame and platen may be sensitively adjusted towards and away from the printing point of the type-bars, and adjustable stops fixed upon each side of the machine-frame, independently of said shiftable members, to limit the up-and-down throw of the shiftable frame.

5. In a typewriting machine, the combination with a machine-frame, a revoluble platen, type-bars of limited printing movement, and a platen-carriage mounted in a shiftable frame, said shiftable frame being swingably mounted upon arms for case-shifting, of type-impression-controlling means consisting of shiftable members upon which said arms are pivoted, said members being adjustably secured to the machine-frame and guided therein, and easily accessible adjusting screw connections between said members and the machine-frame, whereby said members and consequently the platen may be sensitively adjusted for type-impressions, and adjustable stops fixed upon each side of the machine-frame, independently of said shiftable members, to limit the up-and-down throw of the shiftable frame.

6. The combination of type-bars, means for limiting the printing strokes of the type-bars, a platen, a platen-carriage, a shiftable frame having rails guiding and supporting said carriage, two upper side arms and two lower side arms whereon said shiftable frame is

swung to move in a direction substantially parallel to the face of a type when printing, bracket-plates at the sides of the machine-frame, said lower arms hinged upon said bracket-plates, means whereby the upper arms are also pivoted upon said bracket-plates, said machine-frame having means to guide said bracket-plates at about right angle to the printing position of the types, adjusting means for each bracket-plate, clamping screws passing through elongated holes in the typewriter-frame, and adjustable stops fixed upon each side of the machine-frame, independently of said bracket-plates, to limit the up-and-down throw of the shiftable frame.

7. The combination of type-bars, means for limiting the printing strokes of the type-bars, a platen, a platen-carriage, a shiftable frame having rails guiding and supporting said carriage, two upper side arms and two lower side arms whereon said shiftable frame is swung to move in a direction substantially parallel to the face of a type when printing, a cross-bar rigidly connecting the lower arms to form a swing-frame, bracket-plates at the sides of the machine-frame, said lower arms hinged upon said bracket-plates, means whereby the upper arms are also pivoted upon said bracket-plates, said machine-frame having means to guide said bracket-plates at about right angle to the printing position of the types, adjusting means for each bracket-plate, clamping screws passing through elongated holes in the typewriter-frame, and adjustable stops fixed upon each side of the machine-frame, independently of said bracket-plates, to limit the up-and-down throw of the shiftable frame.

8. The combination of type-bars, means for limiting the printing strokes of the type-bars, a platen, a platen-carriage, a shiftable frame having rails guiding and supporting said carriage, two upper side arms and two lower side arms whereon said shiftable frame is swung to move in a direction substantially parallel to the face of a type when printing, a cross-bar rigidly connecting the lower arms to form a swing-frame, bracket-plates at the sides of the machine-frame, said lower arms hinged upon said bracket-plates, means whereby the upper arms are also pivoted upon said bracket-plates, said machine-frame having means to guide said bracket-plates at about right angle to the printing position of the types, a plate riveted to each side of the typewriter-frame and having a part engaging a groove in a shift-frame adjusting screw mounted upon the machine-frame and having an operating head projecting to position accessible from the rear of the machine, clamping screws passing through elongated holes in the typewriter-frame, and adjustable stops fixed upon each side of the machine-frame, independently of said bracket-plates, to limit the up-and-down throw of the shiftable frame.

9. In a typewriting machine, the combination of a case-shifting frame, two upper side arms and two lower side arms whereon said frame is mounted to shift up and down, a cross-bar rigidly connecting the lower arms to form a swing-frame, said lower arms having extensions reaching forwardly beyond their points of pivoting to the case-shifting frame, and lower and upper adjustable stops mounted upon the framing of the machine to be engageable by the ends of said forward extensions, for supporting the shifting frame and limiting its throw.

WILLIAM A. DOBSON.