July 6, 1954 F. W. SCHREMP 2,682,944

TYPEWRITER TYPE-ACTION AND TOUCH CONTROL

Filed March 6, 1953 4 Sheets-Sheet 1

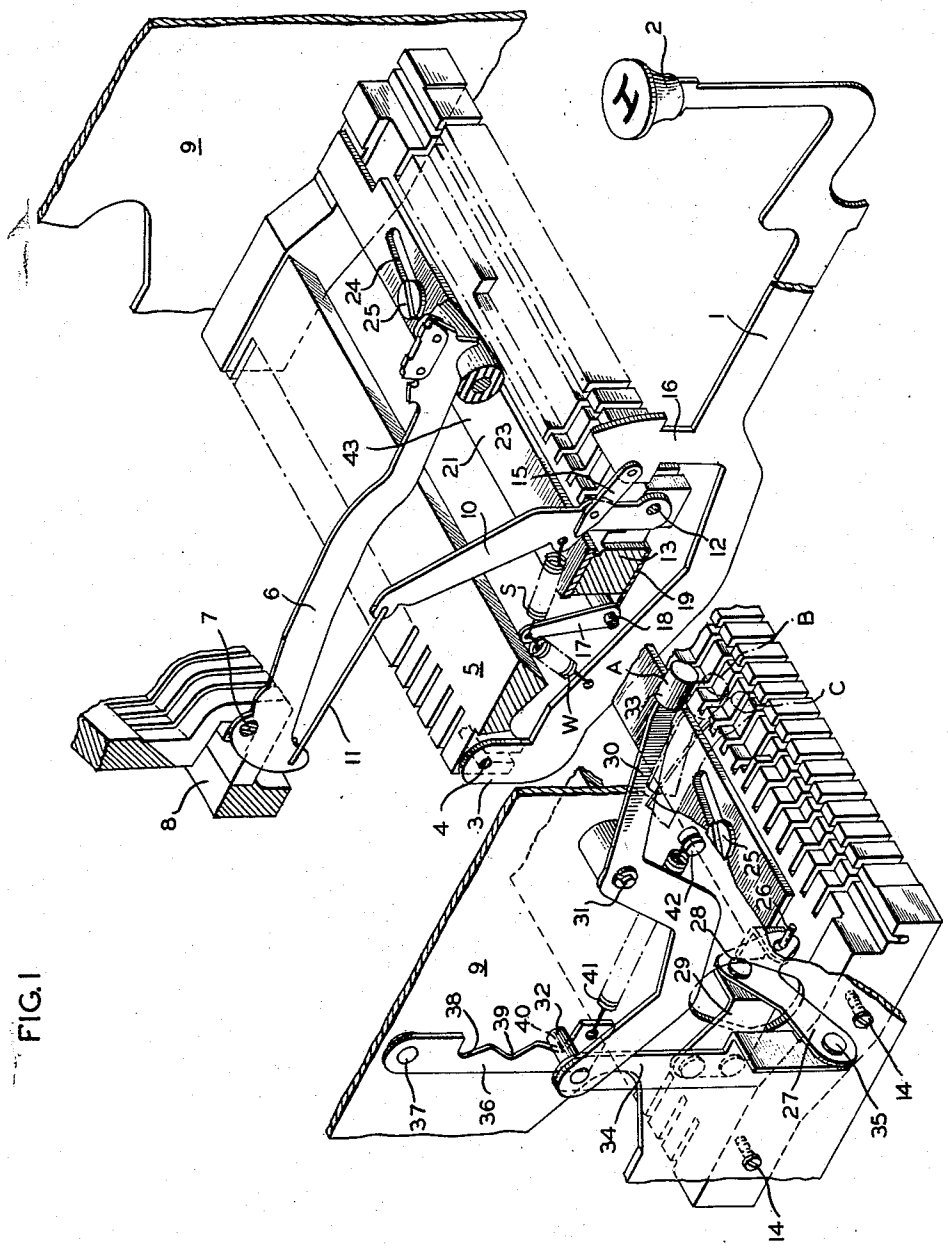


FIG. 1

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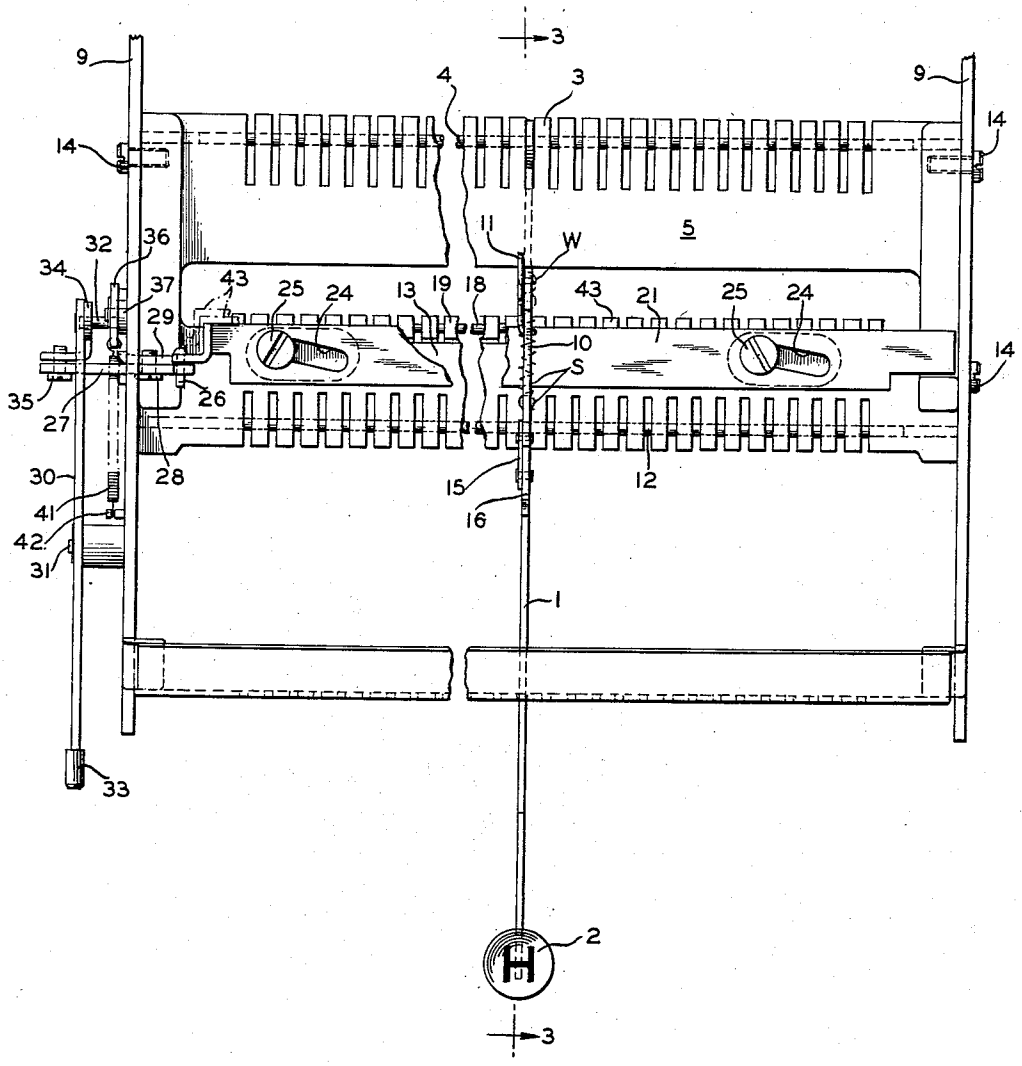
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TYPEWRITER TYPE-ACTION AND TOUCH CONTROL

Filed March 6, 1953 4 Sheets-Sheet 2

FIG. 2



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TYPEWRITER TYPE-ACTION AND TOUCH CONTROL

Filed March 6, 1953 4 Sheets-Sheet 3

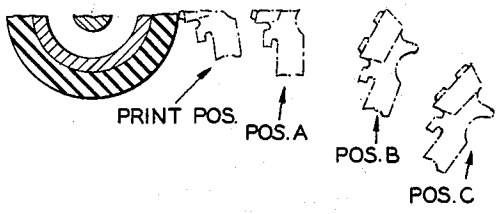
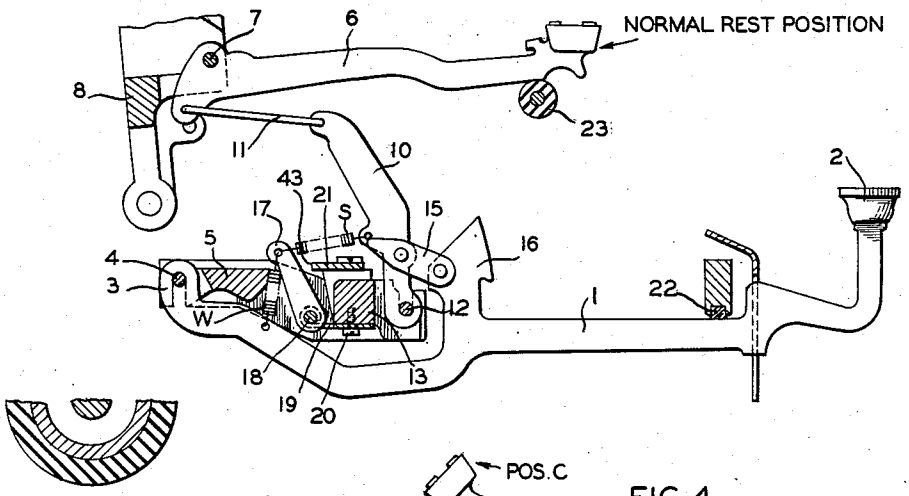


FIG.3



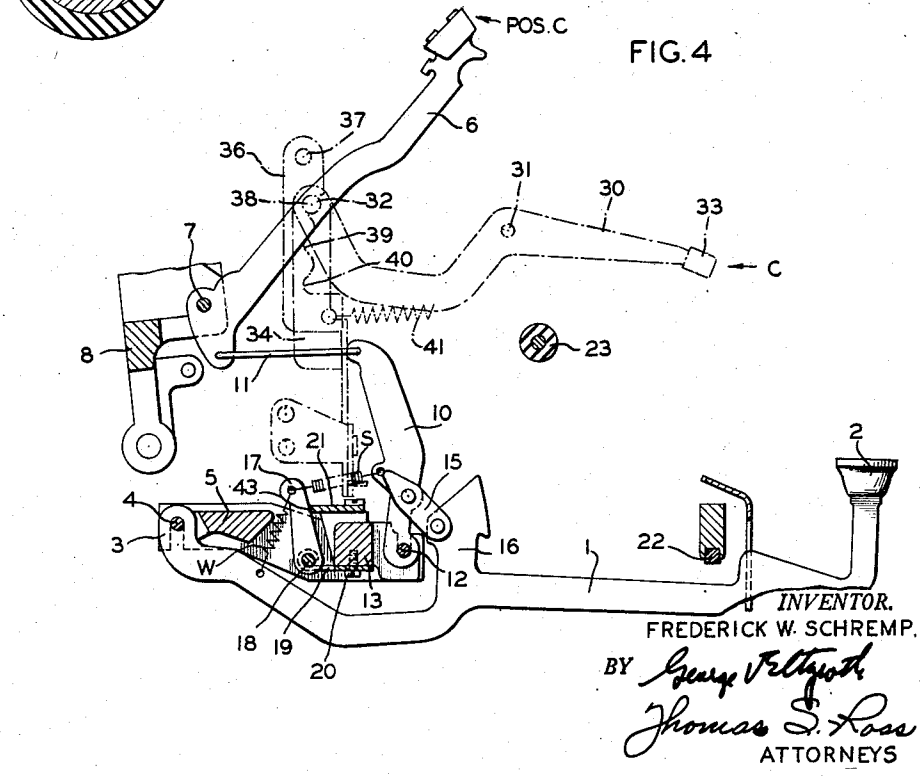


FIG.4

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July 6, 1954 F. W. SCHREMP 2,682,944

TYPEWRITER TYPE-ACTION AND TOUCH CONTROL

Filed March 6, 1953 4 Sheets-Sheet 4

FIG. 5

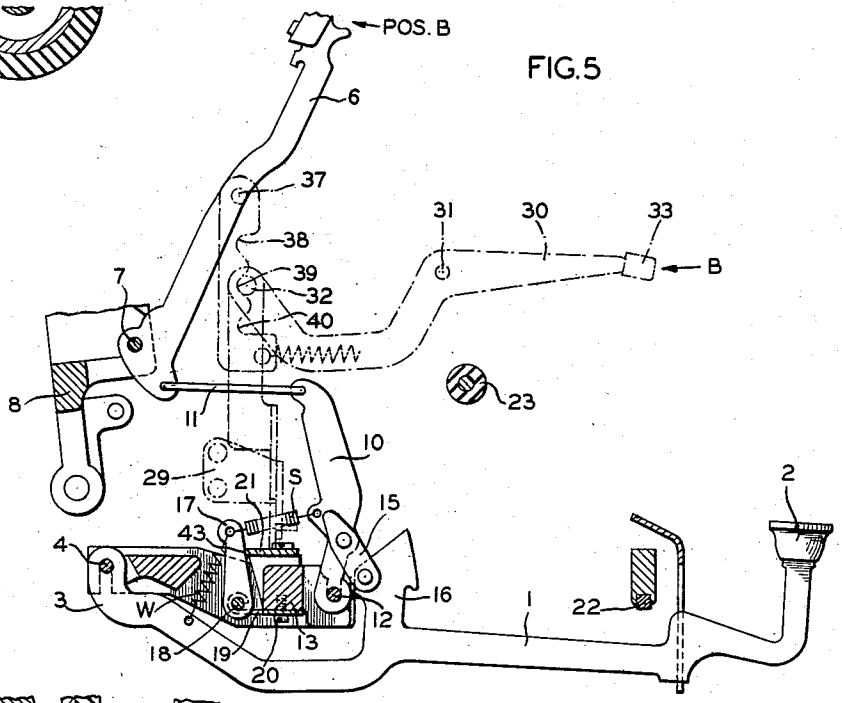


FIG. 6

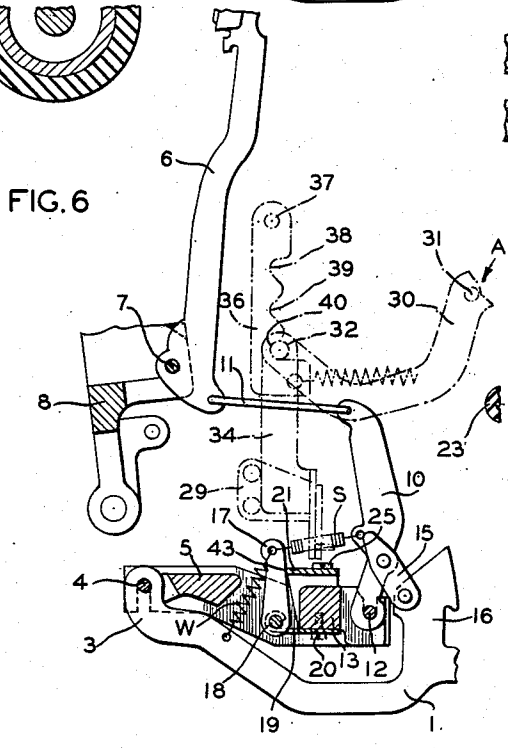
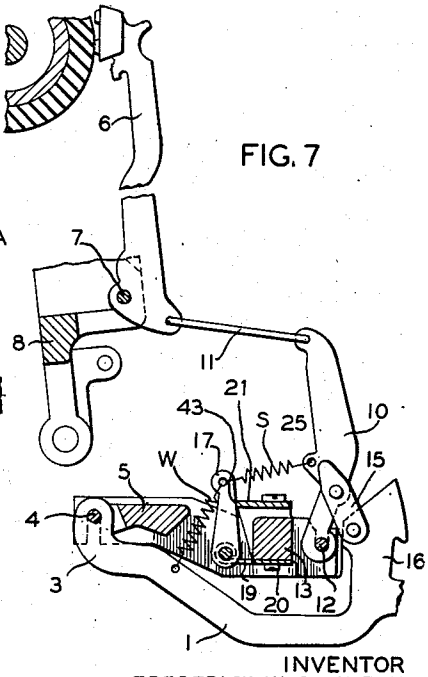


FIG. 7



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UNITED STATES PATENT OFFICE

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TYPEWRITER TYPE-ACTION AND TOUCH CONTROL

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Application March 6, 1953, Serial No. 340,725

12 Claims. (Cl. 197—33)

1

This invention relates broadly to typewriter type-actions and more particularly to that class of type-actions in which the type bars are actuated by key levers through other levers interposed between the key levers and the type bars and operatively connected therewith. In typewriter type-actions such as those employed in the present Remington typewriter, the interposed levers between the key levers and type bars include pivoted bell cranks which are connected with the key levers by short links and with the heels of the type bars through pull wires.

The present invention provides improvements concerning the operation of a pair of retracting springs for each type-action of the class above described, and more specifically to improved key touch regulating mechanism for selectively controlling the extent of distortion imparted to such springs to effect variations in finger pressure of different operators and also selectively change the recovery time of the type bars from the printing point.

In key touch regulation mechanism for typewriter type-actions according to this invention, the initial tension of the key levers is not disturbed regardless of the position to which the key touch regulating mechanism is set. To this end the invention provides two retracting springs of different strengths for each type-action and operator controlled means for simultaneously predetermining the extent to which the stronger of such springs is distorted when it is desired to change the cushioning action of the key levers and to lengthen or shorten the recovery time of the type bars.

Another feature of the invention is to provide operator controlled means for selectively changing the cushioning action of the key levers without preloading the stronger of the two retracting springs provided for each type-action.

Various other objects and features of the invention will become apparent from the following detailed description relating to the accompanying drawings, wherein one form of the invention is illustrated.

The essential characteristics of the invention are summarized in the claims.

In the drawings:

Fig. 1 is a fragmentary view of a typewriter in perspective showing one type-action in normal or idle position and the improved mechanism for selectively controlling distortion of the type-action retracting springs to control the operating touch of the typing keys, said key touch regulating mechanism being shown in the position for lightest key touch.

2

Fig. 2 is a plan view of Fig. 1 with the type bar and type bar segment omitted.

Fig. 3 is a side elevational view of a single type-action with its parts in normal or rest position and showing the stop bar of the key touch regulating mechanism at its setting for heaviest key touch.

Fig. 4 is a side elevation similar to Fig. 3 but showing the typing key partly depressed to the position where the key touch regulating stop bar becomes effective to cause distortion of the stronger of the type-action retracting springs for heaviest key touch.

Fig. 5 is a side elevational view similar to Fig. 4 but showing the key touch regulating mechanism set to a position between heaviest and lightest key touch.

Fig. 6 is a side elevation similar to Fig. 5 but with the key touch regulating mechanism set for lightest key touch, and

Fig. 7 is a side elevation similar to Fig. 6 but showing the type bar advanced to the printing position.

In the accompanying drawings one application of the invention is shown embodied in a Remington typewriter but it will be understood that the invention may be applied equally well to other known typewriters or like manually operated writing machines.

The drawings have been simplified to illustrate only those portions of the typewriter as is necessary to a complete understanding of the invention. Moreover, only one type-action has been illustrated but it will be understood that all of the type-actions are constructed in a like manner and that each comprises a key lever 1 which is provided at its forward end with a finger key 2 and fulcrumed at its rear end 3 on a common fulcrum wire 4, the latter being rigidly held within a groove in cross bar 5 in the usual and well known manner. Each key lever 1 actuates its associated type bar 6 the heel of which is pivotally mounted at 7 upon a suitable type bar segment 8. The segment 8 is mounted for conventional vertical case shift movement between the machine side frames 9 portions of which are shown in Fig. 1. Each type bar 6 is connected to the upper end of its associated bell crank 10 by the usual pull wire or link 11 and the bell crank is fulcrumed at its lower end on a common fulcrum rod 12 supported by cross bar 13. The cross bars 5 and 13 respectively, may be conveniently formed as a casting, such as that illustrated in Fig. 1, and the casting is secured between the side frames 9 by screws 14. Each key lever 1 is connected to its associated bell crank 10 by a

short link 15 one end of which is pivotally attached to the bell crank 10 and the other end pivotally attached to the vertical extension or leg 16 of key lever 1.

All of the parts thus far described are of the usual and well known construction with the exception of the type-action retracting springs and the means for controlling the distortion of such springs as will now be described in detail.

As previously mentioned each type-action is provided with a pair of retracting springs one being of a different tension than the other, and as shown in Fig. 3, spring S connected between bell crank 10 and its associated pivoted lever 17 is the stronger and spring W connected between the pivoted lever 17 and key lever 1 is the weaker of said pair of springs. Each lever 17 is pivoted at its lower end upon a common fulcrum rod 18 which is mounted in a bracket 19 fastened beneath cross bar 13 by screws 20. The stronger type-action retracting spring S serves as a solid connection between bell crank 10 and its associated pivoted lever 17 during depression of the key lever 1 until rocking movement of said lever is arrested by an adjustable abutment or stop bar 21 in a manner presently described, and the weaker spring W acts to initially tension the type-action and to hold the key lever 1 against the usual upstop 22 and the type bars 6 against the conventional arcuate rest or basket 23.

Means are provided to vary the extent of distortion imparted to springs S and thereby vary the tension upon the key levers 1 to conform to the individual or preferred stroke of the typist or operator. This means includes the adjustable stop bar 21 which is free to slide or be moved horizontally upon the cross bar 13 so as to increase or decrease the distance between its working edge 43 and the pivoted levers 17.

As will be clear from Fig. 1, stop bar 21 has a pair of spaced diagonal slots 24 to receive and cooperate with shoulder studs 25 threaded into the cross bar 13. The left hand end of stop bar 21 is bent upwardly and outwardly to carry a horizontally disposed pin 26, the pin operating within the forked or slotted end of a lever 27. Lever 27 is pivoted intermediate its ends upon a shoulder screw 28 threaded to bracket 29 and the bracket is suitably fastened to the left side frame 9 as indicated in Fig. 1. Rocking movement is imparted to lever 27 through a control lever 30 which is journaled intermediate its ends upon a pivot stud 31 projecting outwardly from the side frame 9. The inner end of lever 30 carries a pin 32 and the outer end a finger piece or knob 33. Link 34 has its upper end pivoted about pin 32 and its lower end pivoted to the outer end of lever 27 by pivoted screw 35.

A detent lever 36 has its upper end pivotally supported upon a shoulder stud 37 projecting outwardly from left side frame 9, and is provided with a plurality of detent notches 38, 39 and 40 for cooperation with the pin 32 carried by the inner end of control lever 30. The detent lever 36 is resiliently urged into engagement with pin 32 by spring 41, one end of which is anchored to the lower end of the detent lever 36 and the other end to a spring stud 42 projecting outwardly from the left side frame 9 as will be clear from Fig. 1.

It will now be understood that when finger piece 33 of control lever 30 is moved in a downward direction by the operator of the machine in successive steps from its initial or starting position, shown by full lines in Fig. 1, link 34 will be elevated to rock lever 27 clockwise upon its pivot 28 which in turn, through pin 26, slides the stop bar 21 rearwardly or to the left as viewed in Figs. 3 to 6 respectively thereby moving its working edge 43 toward the pivoted levers 17. When control lever 30 is in its upper-most or starting position, which is the position illustrated in Fig. 6, pin 32 will be engaged with detent notch 40 and the stop bar 21 will be moved to its extreme forward position within the machine. Similarly, when control lever 30 is moved to its lower-most position (Fig. 4) pin 32 will be engaged with detent notch 38 in detent lever 36 and stop bar 21 will be moved to its extreme rearward position within the machine. Thus it will be clear that downward movement of lever 30 shortens the distance between levers 17 and the working edge 43 of stop bar 21 and conversely, upward movement of lever 30 lengthens the distance between the levers 17 and working edge 43 of the stop bar. Fig. 3 graphically shows the positions of the type bar 6 at which distortion of spring S begins in accordance with the setting of control lever 30.

Operation of the improved typewriter type-action and touch control, according to the present invention, is as follows: For lightest touch of finger keys 2 the knob end of control lever 30 is raised to its upper-most position, as shown at A in Figs. 1 and 6, thereby engaging pin 32 with notch 40 in detent lever 36. This shifts stop bar 21 to its extreme forward position within the machine to provide the maximum clearance between its working edge 43 and the pivoted levers 17 when the latter are in normal or idle position.

When the stop bar is thus moved to its extreme forward position, full depression of any key lever 1 will drive its associated type bar 6 to position A, as indicated in Figs. 3 and 6, before clockwise movement of pivoted lever 17 is arrested by stop bar 21. Distortion or stretching of the stronger spring S consequently starts when lever 17 engages stop bar 21, and continues to stretch until the type bar reaches the printing position shown by dotted lines in Fig. 3 and by full lines in Fig. 7. It will now be clear from Fig. 3 that whenever the control lever 30 is moved to position A (Fig. 6) distortion of spring S takes place only during the flight of type bar 6 between position A (Fig. 3) and the printing position. When the typist moves control lever 30 downwardly to position B (Fig. 5) to engage pin 32 with notch 39 in detent lever 36, stop bar 21 will be moved rearwardly in the machine to reduce the clearance between its working edge 43 and all of the pivoted levers 17. Accordingly, full depression of any key lever 1 will now drive its associated type bar 6 to position B before clockwise movement of pivoted lever 17 is arrested by stop bar 21. With this new position of the control lever 30, distortion or stretching of springs S will start as soon as lever 17 engages the stop bar 21, and the spring will continue to stretch until the type bar reaches the printing position. Referring again to Fig. 3, it will now be understood that when control lever 30 is set at position B (Fig. 5) distortion of spring S takes place during the flight of the type bar between position B and the printing position. In other words, when control lever 30 is set at position B spring S starts to stretch earlier during the flight of the type bar and is stretched further than when the control lever 30 is set in position A.

It will be further observed that when control lever 30 is set at position C for heaviest key-touch (Fig. 4), stop bar 21 is then moved or shifted to its extreme rearward position within the machine to provide minimum clearance between its work-

ing edge and the pivoted lever 17 when the latter is in normal rest position. Now upon full depression of any key lever 1 its associated type bar 6 will be driven to position C (Fig. 3), before clockwise movement of lever 17 is arrested by the stop bar 21 and therefore, distortion or stretching of spring S starts when lever 17 engages the stop bar, and continues to stretch until the type bar reaches the printing position.

It will now be apparent that the operating touch of all of the typing keys 2 may be simultaneously and uniformly varied by a typist by merely raising or lowering control lever 30 which in turn variably controls the duration and extent of distortion imparted to the springs S without preloading said springs prior to full key depressions. Since movement of the control lever merely shifts the position of the stop bar, and does not directly stretch or distort the springs S or W, such distortion takes place only during key depression and not before. This insures a smooth stretching of the springs S without imparting any noticeable shock to the typist's fingers.

While there is in this application specifically described one form which the invention may assume in practice, it will be understood that this form of the same is shown for purposes of illustration only and that the invention may be modified and embodied in various other forms without departing from its spirit or the scope of appended claims.

The invention claimed is:

1. In a typewriter type-action, the combination of: a pivoted key lever; a pivoted type bar; operating connections between said key lever and said type bar; a pivoted lever intermediate said key lever and said operating connections; a pair of springs of different strengths one being connected between the free end of said pivoted lever and said key lever and the other connected between the free end of said pivoted lever and said operating connections; a stop bar located between said pivoted lever and said operating connections; and means for shifting said bar toward and from said pivoted lever to selectively vary the extent of distortion imparted to the stronger of said springs during depression of said key lever to thereby effect variations in finger pressure upon said key lever and a change in the recovery time of said type bar.

2. In a typewriter type-action, the combination of: a pivoted key lever; a pivoted type bar; operating connections between said key lever and type bar including a pivoted bell crank; a link connecting said bell crank with said key lever; a pull wire connecting the heel of said type bar with the free end of said bell crank; a pivoted lever disposed between said key lever and said bell crank; a pair of springs one of which is connected between the free end of said pivoted lever and said bell crank and the other connected between the free end of said pivoted lever and said key lever; a stop bar; and means for shifting said bar toward and from said pivoted lever to vary the extent of distortion imparted to the spring connected between said pivoted lever and said bell crank only during depression of said key lever to thereby effect variations in finger pressure upon said key lever and variations in the recovery time of said type bar.

3. In a typewriter type-action of the class described including a pivoted key lever, a pivoted type bar and positive operating connections between the key lever and type bar, of means to effect variation in finger pressure upon said key lever and variations in the recovery time of said type bar comprising: a pivoted lever for each type-action disposed between its associated key lever and operating connections; a pair of springs of different strengths, the stronger of which is connected between the pivoted lever and said operating connections and the weaker of which is connected between said pivoted lever and said key lever; a stop bar mounted for movement toward and from said pivoted lever and means including a control lever for moving said bar to selectively vary the extent of distortion imparted to the stronger of said pair of springs, such distortion taking place only after rocking movement of said lever is arrested by engagement with said bar.

4. In a typewriter or like printing machine having a series of type-actions each including a pivoted type bar, a pivoted key lever and operating connections between the type bar and key lever, the combination of: a pivoted lever for each type-action located between said operating connections and said pivoted key lever; a first spring connected between said pivoted lever and said operating connections; a second spring connected between said pivoted lever and said key lever; an adjustable stop bar; and means for moving said bar toward and from said pivoted lever to control the amount of distortion imparted to said first named spring during the course of depression of said key lever to vary the operating touch of said type-action in accordance with the position to which said bar is set.

5. In a typewriter or like printing machine having a plurality of type-actions arranged side by side, each type-action including a pivoted type bar; a pivoted key lever and positive operating connections between its type bar and key lever, the combination of: a pivoted lever for each type-action located between said operating connections and said pivoted key lever; a pair of coil springs having different tensions, the stronger of which is connected between said pivoted lever and said operating connections and the weaker of which is connected between the pivoted lever and said key lever; an adjustable stop bar arranged to arrest rocking movement of said pivoted lever; and manually operable means for selectively moving said stop bar toward and from said pivoted lever to vary the amount of distortion imparted to the stronger of said pair of springs only during the course of depression of said key lever whereby the operating touch of said type-action is varied in accordance with the set position of said stop bar.

6. In a typewriter or like key operated printing machine having a series of type-actions arranged side by side, each type action including a pivoted type bar, a pivoted key lever, and positive operating connections between each key lever and type bar, of means for regulating the touch of said key levers comprising: a pivoted lever for each type action; a pair of coil springs one of which is connected between said pivoted lever and said operating connections and the other between said pivoted lever and said key lever; a stop bar arranged to move toward and from said pivoted levers; and means to progressively move said stop bar relative to said pivoted levers to increase or decrease the distance therebetween to effectively vary the extent of distortion imparted to said first named springs during depression strokes of said key levers.

7. In a typewriter or like key operated machine having a series of type-actions arranged side by

side, each type-action including a pivoted type bar, a depressible key lever, and positive operating connections between each key lever and type bar including a pivoted bell crank, of means for selectively controlling the touch of said key levers comprising: a pivoted lever located intermediate said key lever and said bell crank; a pair of coil springs of different strength, the stronger of which is connected between said pivoted lever and said bell crank and the weaker of which is connected between said pivoted lever and said key lever; a movable stop bar cooperable with said pivoted levers; and manually operable means including a pivoted control lever for moving said stop bar stepwise toward and from said pivoted levers to vary the distance between said stop bar and said pivoted levers and in turn vary the extent of distortion imparted to the stronger of said pair of springs only during depression strokes of said key levers.

8. In a typewriter having a series of type-actions arranged side by side, each type action including a depressible key lever, a pivoted type bar and positive operating connections between said key lever and type bar, in combination with touch regulating means for said key levers comprising: a series of pivoted levers one for each type-action; a pair of springs for each type-action one being connected between its associated pivoted lever and positive operating connections and the other between said pivoted lever and corresponding key lever; a stop bar mounted for horizontal movement within said machine; and manual means for progressively moving said stop bar toward and from said pivoted levers to arrest rocking movement of the levers at different selected points during manual depression of said key levers to vary the extent of distortion imparted to the springs connected between said pivoted levers and said positive operating connections.

9. In a typewriter as claimed in claim 8 wherein the springs between the pivoted levers and positive operating connections serve as a solid connection during depression of said key levers until rocking movement of said pivoted levers is

arrested by said stop bar and thereafter yieldingly resist completion of said key lever depressions.

10. In a typewriter as claimed in claim 8 wherein the springs between the pivoted levers and operating connections are of greater strength than the springs between the pivoted levers and key levers and are longitudinally stretched only upon contact of said pivoted levers with said stop bar.

11. In a typewriter having a plurality of type-actions, each type-action comprising the combination of: a key lever; a type bar; operating connections between said key lever and said type bar; a movable member for each type-action disposed between said operating connections and said key lever; a pair of springs of different strengths for each type-action the weaker one of which is connected between said movable member and said key lever, and the stronger one connected between said movable member and said operating connections; a movable stop bar cooperable with and common to all of said movable members; and manually operable means accessible from the outside of said typewriter operably connected to said stop bar for moving said bar toward and from said movable members to effectively increase or decrease the degree of distortion imparted to the stronger of said pair of springs during depression strokes of said key levers.

12. In a typewriter as claimed in claim 11 wherein movement of the common stop bar toward or from said movable members, for increasing or decreasing the degree of distortion imparted to the stronger of said pair of springs during depression strokes of said key levers, also serves to shorten or lengthen the recovery time of said type bars.

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