Feb. 28, 1939. R. RAUSCHER 2,148,877

TYPEWRITING AND LIKE MACHINE

Filed Feb. 13, 1937 4 Sheets-Sheet 1

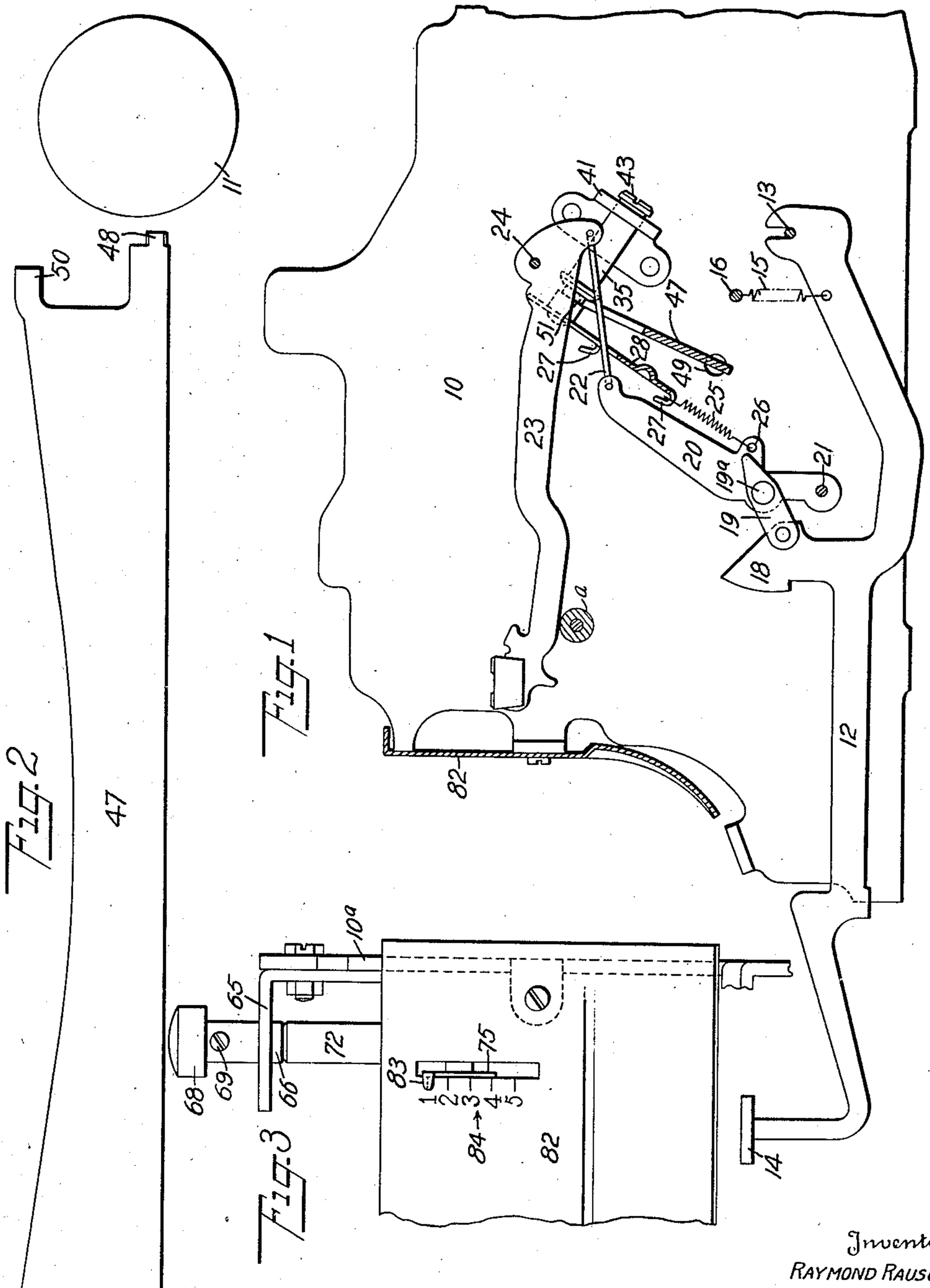

Fig. 2

Fig. 1

Fig. 3

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TYPEWRITING AND LIKE MACHINE

Filed Feb. 13, 1937 4 Sheets-Sheet 2

Fig. 5

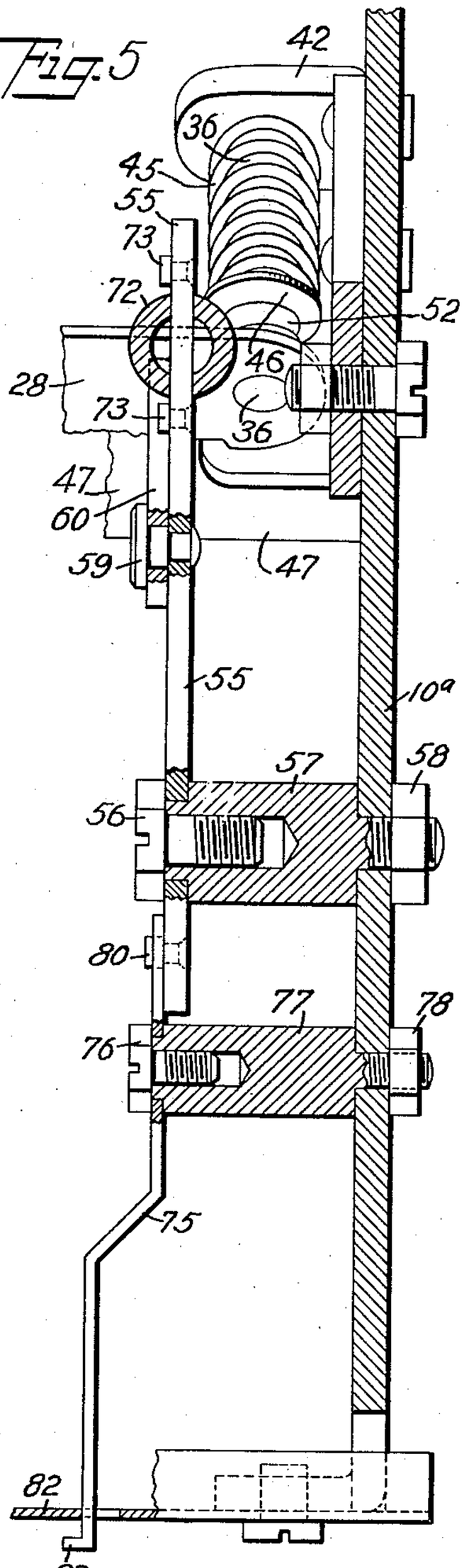
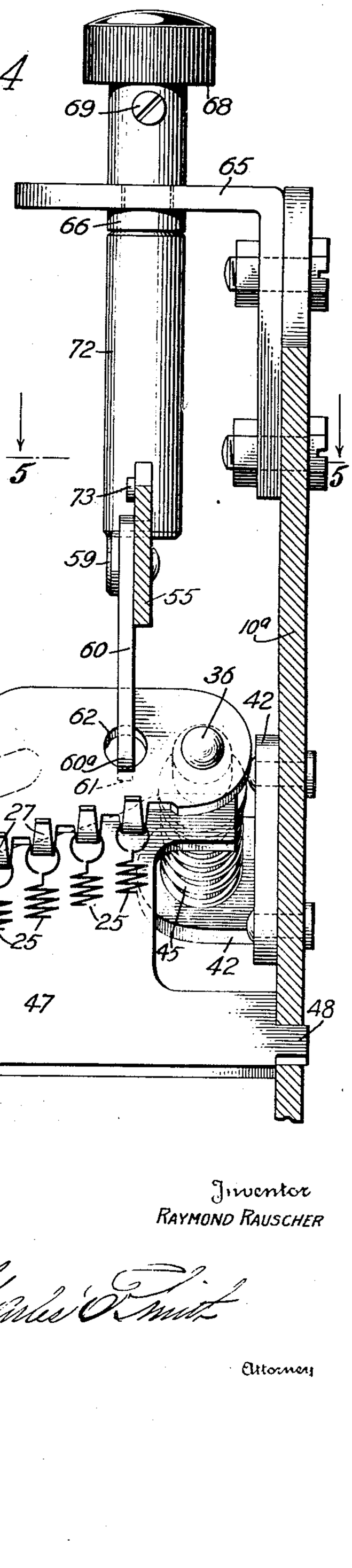


Fig. 4



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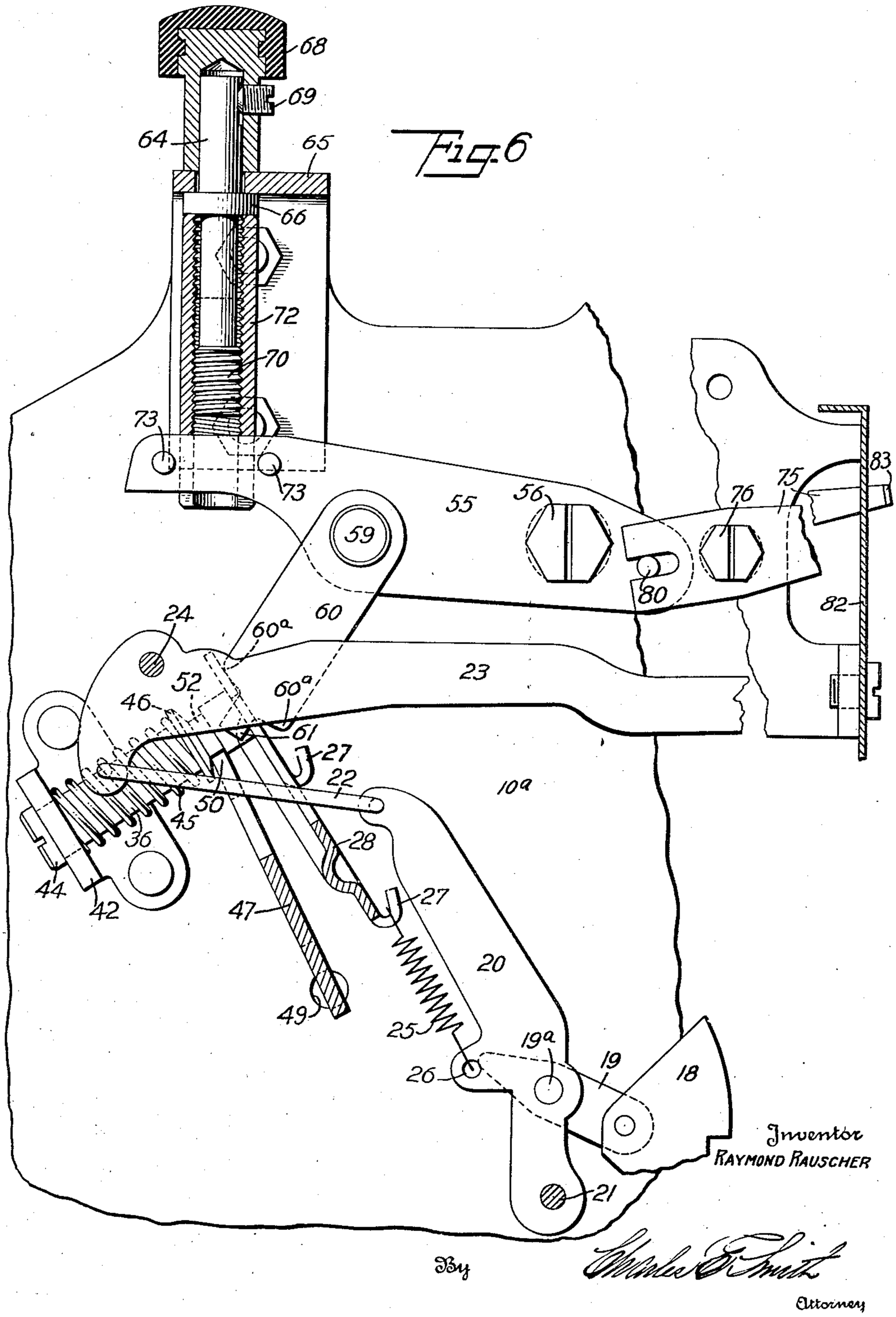
TYPEWRITING AND LIKE MACHINE

Filed Feb. 13, 1937 4 Sheets-Sheet 3

Fig. 6



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TYPEWRITING AND LIKE MACHINE

Filed Feb. 13, 1937 4 Sheets-Sheet 4

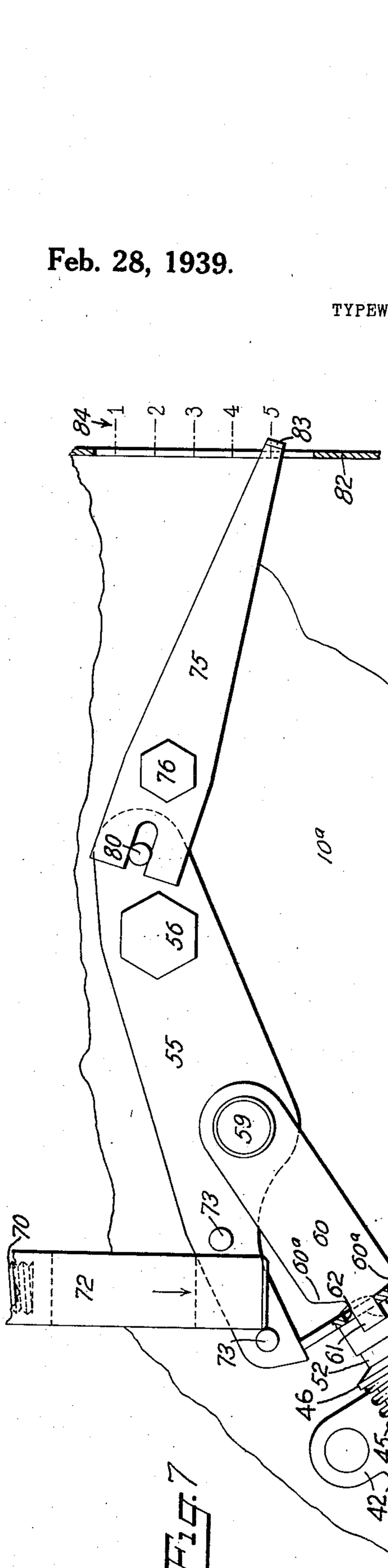

Fig. 7

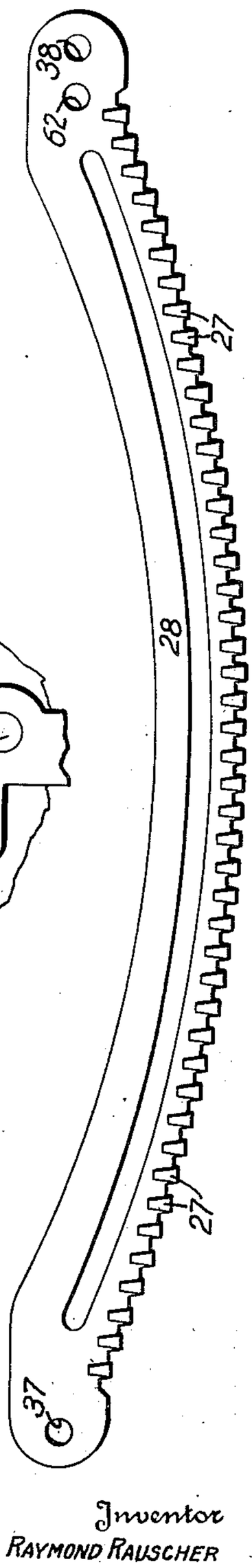

Fig. 8

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Patented Feb. 28, 1939

2,148,877

UNITED STATES PATENT OFFICE

2,148,877

TYPEWRITING AND LIKE MACHINE

Raymond Rauscher, Elmira, N. Y., assignor to Remington Rand Inc., Buffalo, N. Y., a corporation of Delaware

Application February 13, 1937, Serial No. 125,561

19 Claims. (Cl. 197—33)

My invention relates in general to typewriting and like machines, and more particularly to improved means for readily varying the effective force of the spring returning means for the type actions thereby providing for a variation in the touch to accord with that found most desirable by different operators.

The main object of my invention, generally stated, is to provide improved means of the character specified which is simple, highly effective and convenient in operation.

A further object of my invention is to provide improved touch regulating means which may be controlled from outside the frame of the machine for simultaneously adjusting the effective force of the returning springs of all the type actions and yet which affords a light initial touch regardless of the adjustment of the effective force of the returning springs.

A still further object of my invention is to provide a construction such as specified in which the adjustment of the touch regulating means is indicated by special indicating means in order that the operator or demonstrator may readily and accurately determine where the touch regulating means are adjusted to and to accurately indicate the increase or decrease in the resistance offered under different adjustments to accord with the touch desired by different individual operators.

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

In the accompanying drawings, wherein like reference characters indicate corresponding parts in the different views:—

Fig. 1 is a vertical, central, fore and aft sectional view of sufficient number of parts of a typewriting machine to illustrate my invention in its embodiment therein.

Fig. 2 is a detail front view of a universal bar or supporting member employed in the present construction.

Fig. 3 is a front elevational view of a portion of the adjusting and indicating means of my invention as embodied in the machine shown in Fig. 1.

Fig. 4 is an enlarged, detail front elevational view of the same with parts in section.

Fig. 5 is a transverse sectional view of the same taken on line 5—5 of Fig. 4 and viewed in the direction of the arrows at said line.

Fig. 6 is a side elevation with parts in section of some of the parts shown in Fig. 5, illustrating the mechanism as it appears when adjusted to afford the lightest operating touch.

Fig. 7 is a view corresponding in part to Fig. 6 but showing the parts adjusted to afford the heaviest operating touch.

Fig. 8 is a detail front view of the spring anchoring member employed in the present construction.

The present invention is in the nature of an improvement on the construction disclosed in a copending application of George G. Going bearing Serial Number 124,287 and filed on February 5, 1937. Features common to both constructions are claimed therein, the claims herein being directed to features not disclosed in said copending application.

In the present instance, only so much of a typewriting machine has been shown as is necessary for a complete understanding of the touch regulating mechanism of my invention. It should be understood, however, that the features of the present invention are not limited to their embodiment in the particular type of machine illustrated herein, but may be employed in various kinds of typewriting or like machines, wherever found available.

The portion of the typewriting machine shown in Fig. 1 includes a usual frame comprising side plates 10 and 10a, said frame housing a complement of type actions, the front strike type bars of which coact with the usual platen 11 mounted on a suitable carriage supported in the usual manner to travel from side to side of the machine, which carriage has not been shown in the present drawings. Each type action includes a key lever 12 pivoted at its rearward end on a fulcrum wire 13 and provided with a finger key 14 at its forward end.

Each key lever 12 is returned toward its normal position by a contractile spring 15 connected to the key lever at a point comparatively close to the fulcrum wire 13 and extending upwardly to an anchor rod 16. Each spring 15 is primarily to counteract the weight of the companion key lever 12 and to insure its return to the definite normal position, but the force exerted by such spring is not sufficient to return the other members of the companion type action to normal position. Inasmuch as the spring 15 is not a factor which determines to any appreciable extent the touch or the force required to operate the type action, the effective force of this spring 15 is not changed by adjustment of the present touch controlling mechanism.

In the present instance an upstanding central portion 18 of each key lever 12 is pivotally connected to one end of a companion pull link 19, the other end of which is pivotally connected at 19a to a companion sub-lever 20. The sub-levers 20 are all pivotally mounted on a pivot wire 21 located below the pivotal connections 19a with the pull links 19 and suitably supported by the machine frame. The upper end of each sub-lever 20 is pivotally connected to one end of a companion pull link 22, the other end of which link is pivotally connected to the heel of a companion type bar 23, the type bars 23 being all pivotally mounted in a type bar segment on a segmental pivot wire 24, each type bar impacting against the front face of the platen 11 when actuated by a depression of the companion key lever.

The parts of each type action are returned to normal position by a contractile returning spring 25. The lower end of each returning spring 25 is connected in the present instance to the companion sub-lever 20, at 26, while the upper end thereof is connected to respective hooked portions 27 of an anchor member or plate 28 shown in detail in Fig. 8. It should be understood however, that each returning spring may be connected to any other suitable part of the companion type action.

The regulation of the operating touch in the present instance is effected by moving the spring anchor member 28 substantially around the points 26 where the springs 25 are connected to the sub-levers 20, thus changing the angle at which the returning springs 25 act on the sub-levers 20 substantially without changing the normal stress of the springs themselves. The method of mounting the anchor member 28 for such regulating movement is shown particularly in Fig. 1 and Fig. 6 wherein it may be seen that the extreme left and right-hand end portions thereof are provided with guide rods 35 and 36 respectively, suitably fixed thereto such as by riveting reduced diameter end portions into holes 37 and 38 respectively in the anchor member 28 (see Fig. 8). The other ends of the guide rods 35 and 36 pass loosely through holes in angle brackets 41 and 42 respectively, the left-hand bracket 41 being secured to the left-hand side plate 10 whereas the right-hand bracket 42 is secured to a similar right-hand side plate 10a.

An expansion spring 45 is provided around the right-hand guide rod 35 between the angle bracket 41 and an annular flange 46 on the guide rod 35. The spring 45 thus biases the anchor member 28 away from the brackets 41 and 42, and the movement of the anchor member in this direction is limited by screws 43 and 44 threaded into the ends of the guide rods 35 and 36 respectively and having enlarged heads engageable with the rear surfaces of the associated brackets 41 and 42.

A pivoted supporting bar or member 47 is provided beneath the front ends of the guide rods 35 and 36 to support the anchor member 28 against the force of the springs 25 and also to insure a uniform movement and a rigid support at both ends of the anchor member 28. This supporting bar 47 is shaped as shown in Fig. 2, the lower extreme ends being provided with rounded pivot extensions 48 which enter holes 49 in the opposite side plates 10 and 10a whereby the supporting member 47 is supported for pivotal movement. The upper parts of each extreme end of the member 47 are provided with ears 50 which enter annular grooves 51 and 52 in the guide rods 35 and 36 respectively of the anchor member 28, thus supporting the anchor member against the force of the returning springs 25 which act to maintain the guide rods and anchor plate 28 in position on the supporting member 47, the anchor plate having a bodily movement therewith.

In accordance with the present invention, I provide means readily accessible to an operator or demonstrator of the machine whereby the anchor member 28 may be adjusted at will to afford an operating touch to meet the particular desires of the individual operator. I also provide means for indicating at all times to the operator the position of adjustment of the anchor member 28, whereby the operator or demonstrator may be informed of the existing condition of the touch regulating means of such machines and is enabled to readily and accurately establish, without undue experimentation, the desired adjustment at all times to meet the requirements of different operators.

This adjusting and indicating means in the present embodiment comprises a toggle arm 55 retained by a headed screw 56 for pivotal movement on the reduced end of a supporting stud 57 attached to the right-hand side plate 10a by a nut 58, as shown in Fig. 5. The toggle arm 55 intermediate its ends is pivotally connected, at 59, to the upper end of a toggle link 60, the lower end of the link 60 having a shouldered contact portion 60a and a projection 61 entering a hole 62 in the right-hand end of the anchor member 28.

The rearwardly extending end of the toggle arm 55 is operable downwardly from the position shown in Fig. 6 to move the anchor member 28 through the toggle link 60 in rearward and downward direction against the force of the spring 45 by micrometer setting means which extends to the outside of the frame of the machine to permit ready adjustment of the touch control mechanism. This micrometer setting means comprises a rotatable shaft 64 extending upwardly above the frame of the machine through a hole in an angle bracket 65 fixedly attached to the right-hand side plate 10a. The shaft 64 while free to turn is retained against longitudinal movement by an integral shoulder 66 engaging the lower surface of the bracket 65 and by the lower end of the hub portion of a finger wheel 68 engaging the upper surface of the bracket 65, the finger wheel 68 being detachably secured to the shaft 64 by a set screw 69 to permit assembly of the shaft 64 on the bracket 65.

The lower end of the shaft 64 is provided with an enlarged diameter threaded portion 70 coacting with internal threads of tubular adjusting member 72. The tubular member 72 is held against rotation by a bifurcated lower end portion thereof straddling the rear extending end portion of the toggle arm 55 between two guide pins 73. Fig. 6 shows the parts as they are disposed when the member 72 is at the highest point of its adjustment and the anchor plate 28 is adjusted to afford the lightest touch. It will be clear that when the parts are disposed as shown in Fig. 6, a turning of the finger wheel 68 in a counterclockwise direction will move the member 72 downward relative to the shaft 64 thus moving the rear end of the toggle arm 55 downward to effect a downward and rearward bodily shift of the anchor member 28 through the toggle link 60 and against the force of the spring 45. The extreme downward position of the adjusting member 72 is shown in Fig. 7 wherein it will be seen that the toggles arm 55 has been moved down-

ward to a position where its extreme rear end engages the upper edge of the anchor member **28**.

The means for indicating the position of adjustment of the touch regulating means, or the position of adjustment of the anchor member **28**, comprises an indicating arm **75** pivoted intermediate its ends on the reduced end of a stud **77** fixed to the right-hand side frame **10a** by a nut **78** threaded onto said stud. A headed screw **76** retains the arm **75** on its pivot. A bifurcated end portion of the indicating arm **75**, extending in the rear of the pivot stud **77**, straddles a pin **80** carried by a portion of the toggle arm **55** extending forward from its pivot stud **57**, whereby the indicating arm **75** is operatively connected to move about its pivot in exact accordance with any adjusting movement of the toggle arm **55**.

The indicating arm **75** extends forward from its pivot stud **77** outside the frame of the machine through a vertical slot in a front plate **82** of the typewriting machine. The extreme front end of the indicating arm **75** is bent over to form a pointer **83** which cooperates with indices **84** suitably marked on the front plate **82**, shown in Fig. 3. These indices **84** represent various points of adjustment of the touch regulating means and obviously the operator or demonstrator can tell at a glance the exact adjustment of such regulating means as set by the finger wheel **68** by observing the position of the pointer **83** relative to the indices **84**.

The various parts of the present construction are shown in Fig. 6 in a position affording the lightest operating touch afforded by the touch regulating means and this position is established by turning the finger wheel **68** in a clockwise direction until the upper end of the tubular operating member **72** engages the shoulder **66** of the shaft **64**. With the attainment of this position of the member **72**, the toggle members **55** and **60** allow the spring anchor member **28** under the force of the spring **45** to assume an extreme forward and upward position limited by the screws **43** and **44** and accordingly locate the indicating arm **75** in its uppermost position in register with the upper indicia **1**.

If it is desired to provide a heavier operating touch, the finger wheel **68** is turned in a counter-clockwise direction to move the adjusting member **72** downward thus causing a straightening movement of the toggle members **55** and **60** to force the anchor member **28** downward and rearward against the force of the spring **45**. The finger wheel **68** may be thus turned in a counter-clockwise direction until the extreme position shown in Fig. 7 is reached wherein the rearward end of the toggle arm **55** engages the anchor member **28**. This position of the various parts shown in Fig. 7 affords the heaviest operating touch under control of the touch regulating means and accordingly the indicating arm **75** is moved to its lowermost position in register with the indicia **5**.

The present touch regulating mechanism is shown in Fig. 1 in an intermediate position of adjustment wherein each of the returning springs **25** is disposed so that it acts substantially against the pivot **21** and against the dead center of the associated sub-lever **20** when such sub-lever is in normal position. The springs **25** however, may be shifted either forwardly or rearwardly of this dead center alinement shown in Fig. 1. When the springs are moved rearwardly of their dead center alinement toward the extreme position shown in Fig. 6, it will be clear that each spring exerts a slight turning force in a clockwise or operating direction on its associated sub-lever when in normal position, but when the springs are moved forwardly of their dead center alinement toward the extreme position shown in Fig. 7, each spring exerts a slight turning force in a counter-clockwise or returning direction on its associated sub-lever when in normal position.

The normal clockwise turning force exerted by each of the springs **25** in its position of adjustment shown in Fig. 6 obviously tends to lift the companion type bar **23** from its normal position, but such lifting action is not sufficient to move the type bar from its type rest *a* nor to prevent the parts of the type action from readily returning and remaining in normal position. It will accordingly be clear that any adjusted position of the anchor member **28** rearwardly beyond the position shown in Fig. 1 toward the position shown in Fig. 6 causes the returning springs to tend to counter-balance to various extents the weight of the type bars and actually tends to aid in the initial operating movement thereof. However, when the anchor member **28** is shifted forwardly of the position shown in Fig. 1 toward the position shown in Fig. 6, the returning springs tend to hold type bars in normal position and actually tend to oppose the initial operating movement thereof.

However, it will be noticed that the simultaneous change in angular relation of all of the springs is substantially around their points of connection **26** with the sub-levers so that the length of each spring **25** is substantially the same in Fig. 6 and Fig. 7 and accordingly it will be clear that the normal stress of the returning springs is not changed by the adjustment of the touch regulating mechanism. The change in the resistance offered by the returning springs to actuation of the type actions is consequently due to the change in the angle at which the returning springs are adjusted to act on the sub-levers in the present instance rather than to any change in the normal stress of the springs.

It will be observed, moreover, that while the above mentioned adjustment does not result in any change in the initial stress of the springs it does result in a variation in the extent of elongation thereof effected during the operation of the type actions, and there is therefore, a change in the effective force of the springs. This construction has a distinct advantage inasmuch as the increase in resistance offered by the returning springs at the first portion of the operating movement of the type actions by shifting the anchor member from its Fig. 6 position to its Fig. 7 position, for example, is very slight as compared to the increase in resistance offered thereby during the latter part of the operating movement of the type actions.

From the foregoing description, it will be understood that I have provided simple and effective touch regulating means which may be readily adjusted from outside the frame of the machine to simultaneously regulate the operating touch required on the printing keys to meet the desires of various operators and yet afford a light initial touch regardless of the adjustment of the touch regulating means. I have also provided a means extending outside the frame of the machine for readily and accurately indicating to the operator or demonstrator the existing adjustment of the touch regulating means in order that the operator or demonstrator may readily determine where to set the touch regulating

means to meet the desires of different operators, in short, whether to increase or decrease the resistance and to what extent.

It will be understood that by the employment of the toggle **55**, **60** and the means for shifting it, simple, easily operated and highly effective means are provided for adjusting the touch control mechanism.

Various changes may be made in the construction, and certain features thereof may be employed without others, without departing from my invention as it is defined in the accompanying claims.

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

1. In a typewriting or like machine, the combination of type actions, springs having an effective force acting in the direction of the length thereof for returning said type actions to their normal position, and touch regulating means comprising toggle means including elements operable to and from a substantially straight line position for simultaneously varying the direction of action of the returning springs, and readily accessible manually operable means for adjusting said toggle means.

2. In a typewriting or like machine, the combination of type actions, springs having an effective force acting in the direction of the length thereof for returning said type actions to their normal position, touch regulating means comprising toggle means including elements operable to and from a substantially straight line position for simultaneously varying the direction of action of the returning springs, readily accessible manually operable means for adjusting said toggle means, and a readily visible indicator operated by said toggle means.

3. In a typewriting machine, the combination of type bars, key levers, pivoted sub-levers, an anchor, returning springs each extending from said anchor to the associated sub-lever in a direction to act substantially against the dead center of the pivot thereof when such sub-lever is in normal position, touch control means including adjusting means controlled from outside the frame of the machine and acting on the said anchor to change the direction of action of the springs on the sub-levers, and means extending outside of the frame of the machine for indicating the position of said adjusting means.

4. In a typewriting machine, the combination of type bars, key levers, pivoted sub-levers, an anchor, springs each extending from said anchor to a sub-lever in a direction to act substantially against the dead center of the pivot thereof when such sub-lever is in normal position, touch control means extending outside of the frame of the machine and including adjusting means acting on said anchor to change the amount of distortion of the springs effected by a normal movement of the sub-levers without affecting the uniform tension of the springs when the sub-levers are in the normal position, and means extending outside the frame of the machine for indicating the different positions of adjustment of said adjusting means.

5. In a typewriting or like machine, the combination of type bars, actuating means therefor, springs having an effective force acting in the direction of the length thereof for returning said actuating means to normal position, touch regulating means operable to vary the effective force of said springs by changing the angular relation thereof relative to said actuating means without appreciably varying the initial tension thereof, and means manually operable from outside the frame of the machine for adjusting said touch regulating means.

6. In a typewriting or like machine, the combination of type bars, actuating means therefor, springs having an effective force acting in the direction of the length thereof for returning said actuating means to normal position, touch regulating means operable to vary the effective force of said springs by changing the angular relation thereof relative to said actuating means without appreciably varying the initial tension thereof, and means extending outside the frame of the machine for indicating the position of said touch regulating means.

7. In a typewriting or like machine, the combination of type bars, actuating means therefor, springs having an effective force acting in the direction of the length thereof for returning said actuating means to normal position, touch regulating means operable to vary the effective force of said springs by changing the angular relation thereof relative to said actuating means without appreciably varying the initial tension thereof, means manually operable from outside the frame of the machine for adjusting said touch regulating means, and means extending outside the frame of the machine for indicating the adjustment of said touch regulating means.

8. In a typewriting or like machine, the combination of type bars, actuating means therefor, springs for returning said actuating means to normal position, and touch regulating means for varying the effective force exerted by said springs on said actuating means substantially without changing the initial tension thereof, said touch regulating means comprising a toggle, a threaded member operatively connected to said toggle, and a finger wheel mounted outside the frame of the machine and having a threaded connection with said threaded member for adjusting said toggle.

9. In a typewriting or like machine, the combination of type bars, actuating means therefor, springs for returning said actuating means to normal position, and touch regulating means for varying the effective force exerted by said springs on said actuating means substantially without changing the initial tension thereof, said touch regulating means comprising a toggle, a threaded member connected to said toggle, a finger wheel mounted outside the frame of the machine and having a threaded connection with said threaded member for adjusting said toggle, a pivoted indicating arm extending outside the frame of the machine and operatively connected to and operated by said toggle, and indices cooperating with said indicating arm.

10. In a typewriting or like machine, the combination of type actions, springs for returning said type actions to their normal position, and touch regulating means for varying the effective force exerted by said springs on said type actions, said touch regulating means comprising a toggle, a threaded member operatively connected to said toggle, and a finger wheel mounted outside the frame of the machine and having a threaded connection with said threaded member for adjusting said toggle and for holding it in its position of adjustment.

11. In a typewriting or like machine, the combination of type actions, springs for returning said type actions to their normal position, and touch regulating means for varying the effective force exerted by said springs on said type actions, said

touch regulating means comprising a toggle, a threaded member operatively connected to said toggle, a finger wheel mounted outside the frame of the machine and having a threaded connection with said threaded member for adjusting said toggle and for holding it in its position of adjustment, a pivoted indicating arm extending outside the frame of the machine and operatively connected to said toggle, and readily visible indices cooperating with said indicating arm for showing the position of adjustment of said touch regulating means.

12. In a typewriting or like machine, the combination of type actions, springs for returning said type actions to normal position, and touch regulating means for varying the effective force of said springs on said type actions, said touch regulating means comprising an anchor to which one end of each of said springs is connected, the other end of each spring being connected to a member of the companion type action, a toggle by which the adjustment of said anchor is controlled for varying the angular relation of said springs relatively to the parts of the type actions to which the springs are connected, and adjusting means for adjusting said toggle.

13. In a typewriting or like machine, the combination of type actions, springs for returning said type actions to normal position, and touch regulating means for varying the effective force of said springs on said type actions, said touch regulating means comprising an anchor to which one end of each of said springs is connected, the other end of each spring being connected to a member of the companion type action, a toggle by which the adjustment of said anchor is controlled for varying the angular relation of said springs relatively to the parts of the type actions to which the springs are connected, micrometer adjusting means extending outside of the frame of the machine for adjusting said toggle, and a spring acting in conjunction with said toggle to effect an adjustment of the anchor and hold it in its adjusted position.

14. In a typewriting or like machine, the combination of type actions, springs for returning said type actions to normal position, and touch regulating means for varying the effective force of said springs on said type actions without varying the initial tension thereof, said touch regulating means comprising an anchor to which one end of each of said springs is connected, the other end of each spring being connected to a member of the companion type action, a toggle by which the adjustment of said anchor is controlled for simultaneously adjusting all of said springs around their points of connection with the type actions, and means which extend outside of the frame of the machine for adjusting said toggle.

15. In a typewriting or like machine, the combination of type actions, springs for returning said type actions to normal position, and touch regulating means for varying the effective force of said springs on said type actions, said touch regulating means comprising an anchor to which one end of each of said springs is connected, the other end of each spring being connected to a member of the companion type action, a toggle by which the adjustment of said anchor is controlled for varying the angular relation of said springs relatively to the parts of the type actions to which the springs are connected, adjusting means for adjusting said toggle, and indicating means controlled by said toggle for indicating the position of adjustment of said anchor.

16. In a typewriting or like machine, the combination of type actions, springs for returning said type actions to normal position, and touch regulating means for varying the effective force of said springs on said type actions without varying the initial tension thereof, said touch regulating means comprising an anchor to which one end of each of said springs is connected, the other end of each spring being connected to a member of the companion type action, a toggle by which the adjustment of said anchor is controlled for simultaneously adjusting all of said springs around their points of connection with the type actions, means which extend outside of the frame of the machine for adjusting said toggle, an indicating member operatively connected to and actuated by one member of said toggle, and indices with which said indicating member cooperates.

17. In a typewriting or like machine, the combination of a type action including a pivoted member, a returning spring connected to said pivoted member, touch regulating means including adjusting means controlled from outside the frame of the machine for changing the normal direction of action of said returning spring to and from the dead center of said pivoted member in either of two directions, and means extending outside the frame of the machine for indicating the position of said adjusting means.

18. In a typewriting or like machine, the combination of a type action including a pivoted member, a returning spring connected to said pivoted member, touch regulating means including adjusting means controlled from outside the frame of the machine for changing the normal direction of action of said returning spring to and from the dead center of said pivoted member in a direction to exert a force tending to initially move the pivoted member from normal position, and means extending outside the frame of the machine for indicating the position of said adjusting means.

19. In a typewriting or like machine, the combination of type actions, springs for returning said type actions to normal position, and touch regulating means comprising adjusting means operable from outside the frame of the machine for simultaneously varying the effective force of all of said springs on the companion type actions by changing the direction in which said effective force acts on the companion type actions substantially without changing the initial stress of said springs, and means extending outside the frame of the machine for indicating the position of said adjustable means.

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