O. BENNETT.

TYPE WRITING MACHINE.

APPLICATION FILED AUG. 21, 1914.

1,151,757.

Patented Aug. 31, 1915.

2 SHEETS—SHEET 1.

Fig. 1

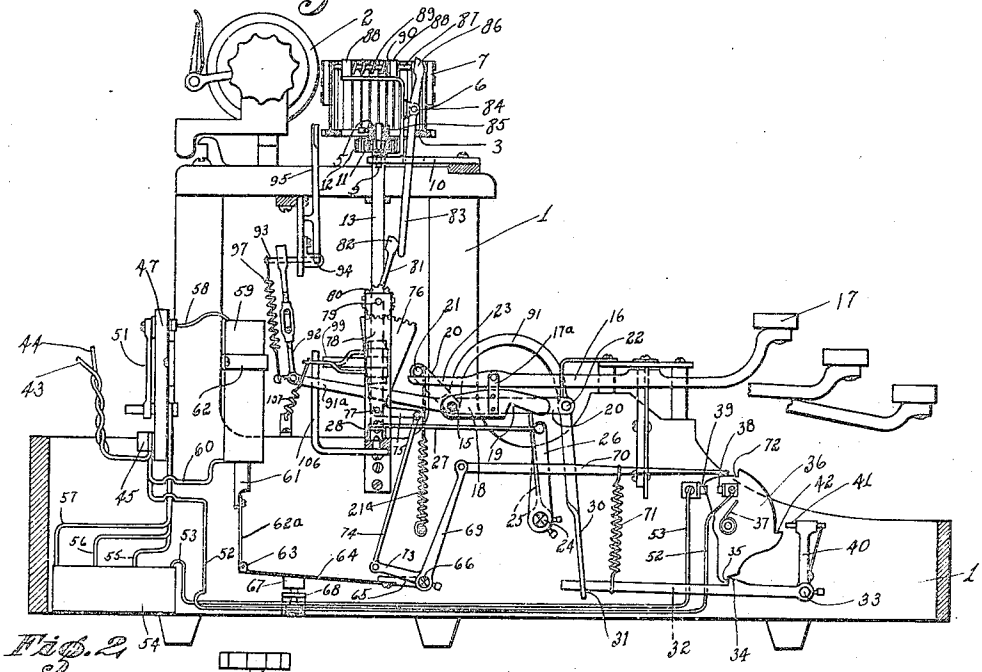
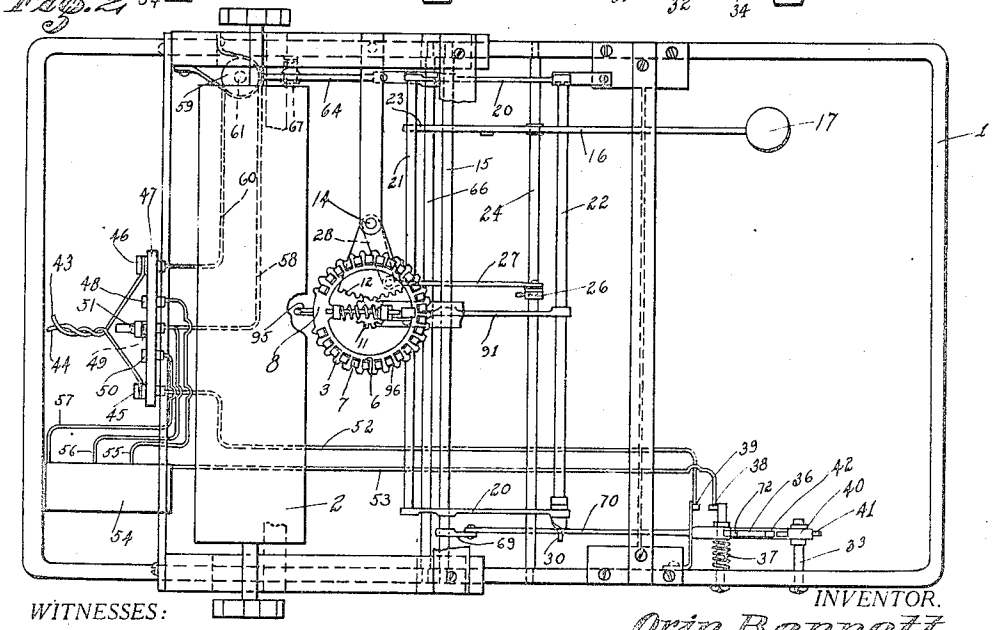


Fig. 2



WITNESSES:

J. B. Webster

F. M. Blanchard

INVENTOR.

Orin Bennett

BY

Jerry Webster

ATTORNEY

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2 SHEETS—SHEET 2.

Fig. 3

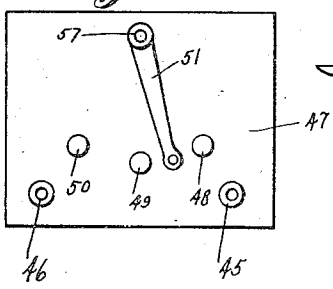


Fig. 4

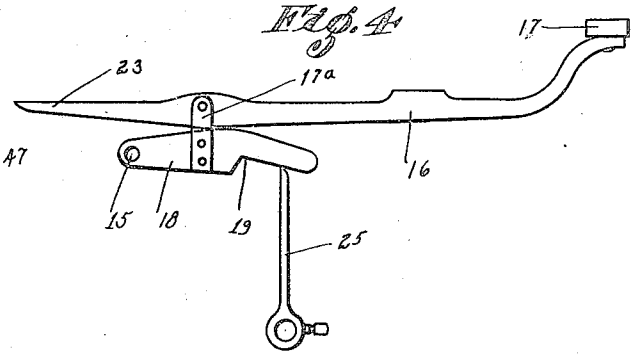


Fig. 5

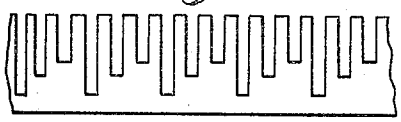


Fig. 8

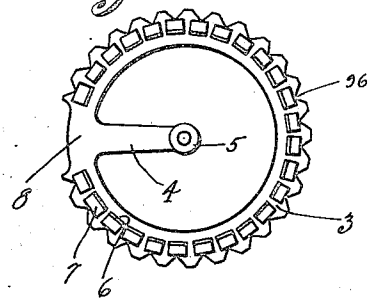


Fig. 6

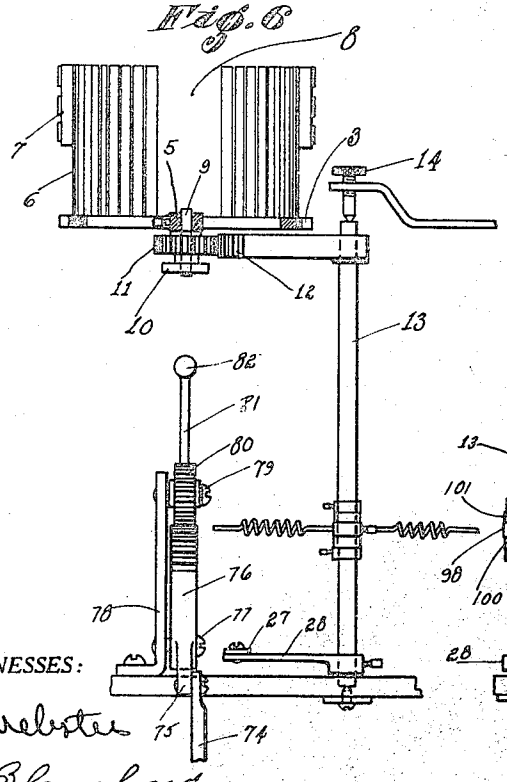
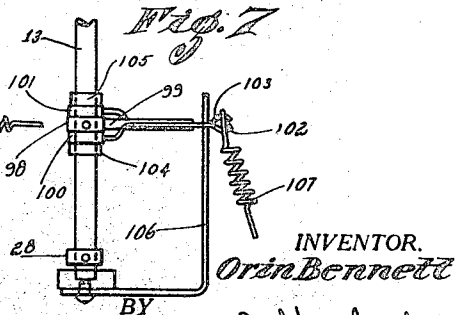


Fig. 7



WITNESSES:

J. B. Webster

F. M. Blanchard

INVENTOR.

Orin Bennett

BY

Percy J. Webster

ATTORNEY

UNITED STATES PATENT OFFICE.

ORIN BENNETT, OF PLACERVILLE, CALIFORNIA.

TYPE-WRITING MACHINE.

1,151,757. Specification of Letters Patent. Patented Aug. 31, 1915.

Application filed August 21, 1914. Serial No. 857,343.

To all whom it may concern:

Be it known that I, ORIN BENNETT, a citizen of the United States, residing at Placerville, in the county of Eldorado, State of California, have invented certain new and useful Improvements in Type-Writing Machines; and I do declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this application.

This invention relates to improvements in typewriting machines, the object of the invention being to provide a new and improved type operating mechanism for the same wherein the type bars are each mechanically operated by an individual hammer mechanism which hammer mechanism is in turn operated by an electrically controlled mechanism, such electrically controlled mechanism being in turn operated by the key mechanism.

The main object of the invention is to produce a means of the character outlined whereby when the keys on the machine are pressed downwardly an equal type impression will be taken from the type irrespective of the manner or speed at which the keys may be operated, such keys merely acting as a releasing or controlling means for throwing the balance of the mechanism into operation, the operation itself being carried on through the medium of the electrical control.

The invention further embodies a new and improved type rack and means for operating the same.

A further object of the invention is to produce a simple and inexpensive device and yet one which will be exceedingly effective for the purposes for which it is designed.

These objects I accomplish by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawings similar characters of reference indicate corresponding parts in the several views.

Figure 1 is a side elevation partly in section of the complete mechanism. Fig. 2 is a top plan view of the same. In both of these views I have shown but one control key connected with the mechanism and but one example of the corresponding connections since of course the same structure would be the same for all the keys and it would but lead to confusion to try and show all in the drawings. Fig. 3 is a front elevation of a regulating switch board. Fig. 4 is a side elevation of the operating key. Fig. 5 is a front elevation of a fragmentary portion of a guide rack. Fig. 6 is a side elevation partly in section of the type carriage and hammer operating mechanism. Fig. 7 is a top plan view of a fragmentary portion of the limiting guides on the type rack operating shaft. Fig. 8 is a detached plan view of the type rack.

Referring now more particularly to the characters of reference on the drawings, the numeral 1 designates the frame of the machine which may be suitably constructed in any desired manner no special claim being made to the same.

The numeral 2 designates the platen which is likewise mounted in any suitable carriage in the usual manner and no special description thereof is hereby entered into.

To facilitate the description of my improved invention it might be well to note at this time that the structure resolves itself into certain sub-divisions and in order to make clear the present description thereof I will state that these sub-divisions consist of the rotary type rack; the key controlled operating means for such type rack; electrical operating mechanism; the switch mechanism for controlling the operation of the electrical apparatus; the hammer mechanism for mechanically operating the type on the type rack and the connections of the same with the electrically operated mechanism.

In describing my invention I will therefore take up each of these sub-divisions in order and describing first

The rotary type rack.—This embodies an annular rack 3 having a single inwardly projecting arm 4 supporting a hub 5. Projecting upwardly from the rack 3 are a plurality of spring type bars 6 carrying the type 7 arranged thereon in any suitable manner. These type bars 6 are arranged on the rack 3 for the greater portion of its circumference but leaving an open space 8 for a purpose as will presently appear.

The hub 5 is fixed to a pin 9 which is supported in any suitable manner on the

frame 1 so as to bring the space 8 immediately adjacent the platen 2. When the rack 3 is in its normal inactive position the pin 9 and hub 5 are turnable in the supporting frame 10 of the said pin 9 and secured to said pin is a small pinion 11. Engageable with the pinion 11 is a pinion rack 12 secured on a vertical shaft 13 suitably journaled in the frame 1 and provided with the usual adjusting screw bearing 14 at one end. With the rotation of the shaft 13 it will be seen that through the medium of the rack 12 and the pinion 11 this will rotate the type rack 3 to bring the type bars 6 and the corresponding type 7 into position adjacent the platen 2. This rotation of the shaft 13 is accomplished by means of:

The key controlled operating means for such type rack.—Describing this last named mechanism, it is first to be noted that it is necessary to have a check or control upon the swinging of the rack 3 so as to bring that type 7 adjacent the platen which corresponds to the letter indicated on the key which is operated and hence each key must have a certain limit of movement whereby the swinging or turning movement of the rack 3 will be determined and particular attention to this point is made at this time in conjunction with the description hereinafter given. Referring particularly to this key mechanism the same involves, first, a shaft 15 fixed to the frame 1. Each key comprises a key bar 16 having the usual finger member 17 and on each key bar 16 is pivotally mounted a small strap 17ª fixed to a lever 18 turnably mounted on the shaft 15. Each lever 18 is provided with an inclined notch 19 these notches being of varying depths and those on one side of the center line of the machine being in reverse position to those on the other side of the center line of the machine all for a purpose as will presently appear.

Turnable on each end of the shaft 15 is a bell crank 20. Connecting one end of said bell crank is a rod 21 and connecting the other end of said bell crank is a rod 22. Each of the key bars 16 is provided beyond its pivotal connection with the member 17 with a finger member 23 normally projecting under the rod 21, the rod 22 lying in the normal path of each key bar 16 all as and for a purpose as will hereinafter appear.

Turnably mounted in the frame 1 immediately below the levers 18 is a shaft 24. Fixed to said shaft are a plurality of upwardly extending finger members 25, one for each of the levers 18, such finger members being engageable with the levers 18 and adapted to move into the notches 19. An arm 26 is secured on the shaft 24 and is connected by a link 27 with an arm 28 secured to the shaft 13 whereby with the rotation of the shaft 24 the shaft 13 will likewise be rotated. The rotation of the shaft 24 is accomplished as follows, namely:

The rod 21 has connected therewith springs 21ª which springs are connected at their other ends with any suitable point independently of the said rod 21. These springs are of sufficient strength so as to pull against the rod 21 to such an extent that when the key bar 16 is moved downwardly it will be caused to move on its primary fulcrumed point 15 rather than on its fulcrumed point 17ª since the tension of these springs 21ª will prevent any upward movement of the bar 21 due to the engagement therewith of the finger 23. Thus with the first movement of the key bar 16 the lever 18 will be moved downwardly on its fulcrumed point 15 and engage the finger member 25. Such finger member will slide upward into the inclined notch 19 until it comes to the bottom of such notch which will be the limit of movement of such finger member 25. Thus the shaft 24 will be turned to a limited degree according to the depth of the notch 19 and will thereby operate the shaft 13 and the rack 3 bringing one of the type bars 6 and its type 7 to a point adjacent the platen 2. Thus by suitable arrangement of the designated letter on the finger member 17 the depth of the notch 19 and the position of the finger member 25 on the shaft 24 with the corresponding letter on the type bar the machine can be arranged to bring the desired numeral adjacent the platen at the desired time. This being done it then becomes necessary to strike the type against the paper on the platen and this calls into action the electrical operating mechanism and the hammer mechanism operated thereby; but in order to throw these mechanisms into operation it becomes necessary first to operate a switch to connect the current with the electrical operating mechanism and therefore I will proceed to describe in detail the

Switch mechanism for controlling the electrical operating mechanism.—After the lever 18 has reached its limit of downward movement and the key bar 16 is still depressed further this causes such key bar 16 to move on its secondary fulcrum 17ª which action causes the finger member 23 to engage and lift the bar 21. This action through the medium of the bell cranks 20 lowers the bar 22. Connected with the bar 22 is a downwardly projecting arm 30 which has a bifurcated end 31 engaging a lever 32 fulcrumed at 33 and provided with a dog 34 engaging a catch 35 in a switch plate 36, the normal engagement of the catch 35 with the dog 34 being maintained by a spiral spring 37 pressing against said plate 36. In this position of the switch plate 36 the contact points 38 and 39 of the electric operating mechanism are held apart the point

38 being carried on the plate 36 and the point 39 being disposed at a point independent of the plate 36.

With the downward movement of the bar 22 as noted above the arm 30 moves against the lever 32 and releases the dog 34 from the catch 35. Incidentally the action of the spring 37 throws the plate 36 to such a position as will bring the points 38 and 39 together. Simultaneously with this movement the downward action of the lever 32 moves an arm 40 on the end of said lever into such a position as to cause a pin 41 on such arm 40 to engage a notch 42 on the plate 36 to limit the movement of the plate 36 to that position at which the points 38 and 39 will be engaged. As has been noted the engagement of the points 38 and 39 completes the electric circuit operating

The electrical operating apparatus.—I will therefore proceed to the description of this last structure as follows, viz: The source of electric energy is derived from any suitable point through wires 43 and 44 connected with terminals 45 and 46 respectively to a switch plate 47 having three contact points 48, 49 and 50 respectively and a switch blade 51 engageable therewith. Connected to the terminal 45 is a wire 52 terminating at the switch contact point 38. Connected to the adjacent switch contact point 39 is a wire 53 running back to a resistance coil 54 said coil being divided into three parts each of which is connected to the contact points 48—49 and 50 by means of wires 55—56 and 57 respectively. Connected to the terminal 57 provided on the switch blade 51 is a wire 58 running to a solenoid coil 59. The return wire 60 from said coil 59 is connected directly to the terminal point 46 thereby completing the circuit and providing a system having a means of introducing a variable amount of resistance into the path of the current actuating the coil 59 so that the power derived from the said coil may be made greater or less as may be desired.

Having thus described the electrical connections I will now explain the result of the action produced by the movement of the core 61 disposed slidably within the said coil 59. This coil is mounted in a bracket 62 fastened to the frame 1 and may be thereby adjusted vertically to obtain the best working position relative to the core 61. Rigidly fastened to the core 61 I have provided a piece of spring wire 62 pivotally connected to a lug 63 integral with a flat steel spring arm 64 which is rigidly fastened to a hub member 65 rigidly mounted upon a shaft 66 pivotally mounted in the said frame 1. Disposed immediately below and in the same plane with the spring arm 64 is provided a rubber bumper 67, adjustably mounted upon a bracket 68 fastened to the said frame 1. This bumper will reduce the jar and noise of the parts upon the cutting off of the current and the resultant quick return of the parts to their normal position as shown in the drawing.

The current being switched into the coil 59 will pull the core 61 upwardly into the said coil with a quick jerk and to overcome this sudden application of movement to the moving parts I have made the aforementioned arm 64 a flat spring member thereby allowing a small amount of movement to the said arm 64 before the shaft 66 can start to rotate so that the jar will in this way become neutralized and in this way making my application of a solenoid coil practicable in a mechanism of this construction. Upon the upward movement of the said core 61 the shaft 66 will be rotated by reason of the aforementioned levers and an arm 69 rigidly fastened thereon will be moved against a lever 70 pivotally mounted with the said arm 69 and resting slidably upon the switch plate 36. To hold this arm 70 against the switch plate 36 I have interposed between the arms 70 and 32 a tension spring 71 fastened respectively to each of the said arms as clearly shown by the drawing. This spring 71 also holds the arm 32 in place and at the same time allows any necessary movement as is necessary to the proper working of the adjacent parts. The said arm 70 being pushed ahead as before mentioned will when the contact points are immediately adjacent each other engage a notch 72 provided upon the switch plate 36. The switch plate will thus be pushed back against the action of the spring 37 until the notch 35 has become engaged with the notch 34 upon the arm 32. In this manner the switch is broken every time and set back to its normal position as shown in the drawing ready for the next key movement.

Simultaneously with the action of the above described mechanism the hammer mechanism will be brought into action and is operated as follows: Rigidly fastened to the shaft 66 I have provided a lever 73 pivotally connected to a link 74 pivotally connected to an arm 75 projecting at a right angle from the gear segment member 76. This member 75—76 is turnably mounted upon a pin 77 mounted in a bracket 78 suitably connected to the said frame 1. Turnably mounted upon a pin 79 carried by the bracket 78 and meshing in the teeth of the gear segment 76 I have provided a pinion 80 having fastened thereto an arm 81 mounted upon which is a hammer member 82 standing immediately back of an arm 83 pivoted as at 84 upon a suitable bracket 85. Upon the extreme end of the arm 83 I have provided a hammer member 86 immediately adjacent a striking pin 87. This striking pin is slidably mounted in the lugs

88 and held in its normal position by a spring 89 working against a collar 90 rigidly mounted upon the said striking pin.

The rotary type rack having been moved the desired amount by reason of the aforementioned mechanism it will be seen that an impression of the type against the platen will be readily obtained against the same by the movement of the shaft 66 transmitted through the described mechanism to the hammer 86. To insure the striking pin against any chance of its not coming against the center of the type I have provided pivotally mounted upon the shaft 15 a lever arm 91 pivotally mounted upon one end to the shaft 22 and having an arm 92 with a turn buckle take up pivotally mounted upon the other extreme end 91ª.

From the before described mechanism it will be understood that the arm 25 can advance only to the bottom of the notch 19. The arm 16 will then be bearing against the shaft 22. The downward pressure on the key member 17 will then by reason of the lever arm 91—91ª push the arm 92 upwardly against a crank arm 93 pivotally mounted upon a bracket as at 94 causing the arm 95 to move forward into the slot 96 provided upon the rotary type rack frame. To draw the arm 95 out of the slot 96 I have provided a spring 97 connected to the end of the arm 93 and fastened at its other extreme end to the arm 91ª. The end of the arm 92 I have made bifurcated so that the desired movements of the parts will be allowed.

The space 8, as clearly shown in Fig. 6, I have provided so that the letters printed upon the paper disposed upon the platen 2 will always be visible and to insure the positive movement of the type rack frame back to its normal position after every stroke of the key I have provided rigidly mounted upon the shaft 13 a collar 98 having a flat lever arm 99 projecting therefrom. Immediately adjacent the collar 98 are turnably mounted the collars 100—101 having respective arms 102—103 projecting therefrom. These collars 100—101 are held in place by means of the said collars 104—105 rigidly mounted upon the said shaft 13. The arm 102 is bent upwardly as shown and the arm 103 upon the opposite side is bent downwardly in order that both arms will be in the same horizontal plane with the projecting lever arm 99. Disposed between the said arms 102—103 is an upright member 106 rigidly fastened to the said frame 1. The shaft 13 upon being rotated will carry the arm 99 against either one of the arms 102—103 according as the shaft is rotated to the right or to the left and act against the tension of the spring 107. In this manner the shaft 13 is always brought back to the same position and incidentally the rotary type rack to its normal starting position.

From the foregoing description it will be readily seen that I have produced such a device as substantially fulfils the object of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention.

Having thus described my invention what I claim as new and useful and desire to secure by Letters Patent is:

1. In a device of the character described, the combination of a type rack, an independent hammer mechanism operable to strike the type carried by said rack, an electrical mechanism for operating said hammer mechanism, and means for positioning said type rack and subsequently thereto throwing said electrical mechanism into operation, such means comprising a lever suitably fulcrumed, another lever fulcrumed on said first named lever, means for retarding the movement of said second named lever so that both levers may move as a unit on the fulcrum of the first named lever and subsequently thereto the second named lever may move on its fulcrumed point, said rack positioning means being operated with the movement of the first named lever, and such electrical mechanism being thrown into operation with the movement of said second named lever, as described.

2. A device of the character described comprising the combination with a type rack carrying type bars, of a hammer mechanism for operating said type bars, said hammer mechanism comprising a pin operable against said type bars, a lever hinged independently of said pin and engageable therewith, a hammer pivotally mounted and engageable with said lever, a pinion on said hammer, a pinion rack engageable with said pinion, a turnable shaft, an arm on said rack and said shaft, a link connecting said arms, a solenoid coil, a core movable within said solenoid coil, means connected between said core and said shaft whereby with the movement of said core said shaft will be turned, an electric circuit connected with said coil and means for making and breaking said circuit at predetermined times, as described.

3. A device of the character described comprising the combination with a type rack carrying type bars, of a hammer mechanism for operating said type bars, said hammer mechanism comprising a pin operable against said type bars, a lever hinged independently of said pin and engageable therewith, a hammer pivotally mounted and engageable with said lever, a pinion on said

hammer, a pinion rack engageable with said pinion, a turnable shaft, an arm on said rack and said shaft, a link connecting said arms, a solenoid coil, a core movable in said coil, a spring member connected with said core, a spring member connected with said shaft said spring members being linked together, a bumper engageable by one of said spring members, an electric circuit connected with said coil and means for making and breaking said circuit at predetermined times, as described.

4. A device of the character described comprising the combination with a type rack carrying type bars, of a means for moving said rack into a plurality of different positions, such means comprising a plurality of key levers, each lever having an inclined notch, the notches of different keys being of varying depths, a turnable shaft, finger members on said shaft, each finger member being engageable with one of said notches, and means connected between said turnable shaft and said type rack whereby said rack will be moved with the movement of said shaft, as described.

5. A device of the character described comprising the combination with an annular type rack turnably mounted on a frame, type bars and type carried thereby, a shaft operable to turn said type rack, another shaft turnably mounted in said frame, a link connection between said shafts whereby with the operation of said second named shaft, said first named shaft will likewise be operated, a finger member on said last named shaft, a key bar, and means operable between said key bar and said finger member to operate said finger member to turn said last named shaft, as described.

6. In a device of the character described the combination with an annular type rack carrying type bars and type, of a means for turning said type rack, such means comprising a key lever, an inclined notch in said key lever, a turnable shaft, a finger member on said shaft engageable with said notch, an arm on said shaft, another turnable shaft, said rack being secured to said last named turnable shaft, and a linked connection between said arm and said second named shaft whereby said second named shaft will be moved with the movement of said first named shaft, as described.

In testimony whereof I affix my signature in presence of two witnesses.

ORIN BENNETT.

Witnesses:

STEPHEN N. BLEWETT,

FLOYD M. BLANCHARD.