

C. SPIRO.
TYPE WRITING MACHINE.

No. 540,078.

Patented May 28, 1895.

Fig. 1.

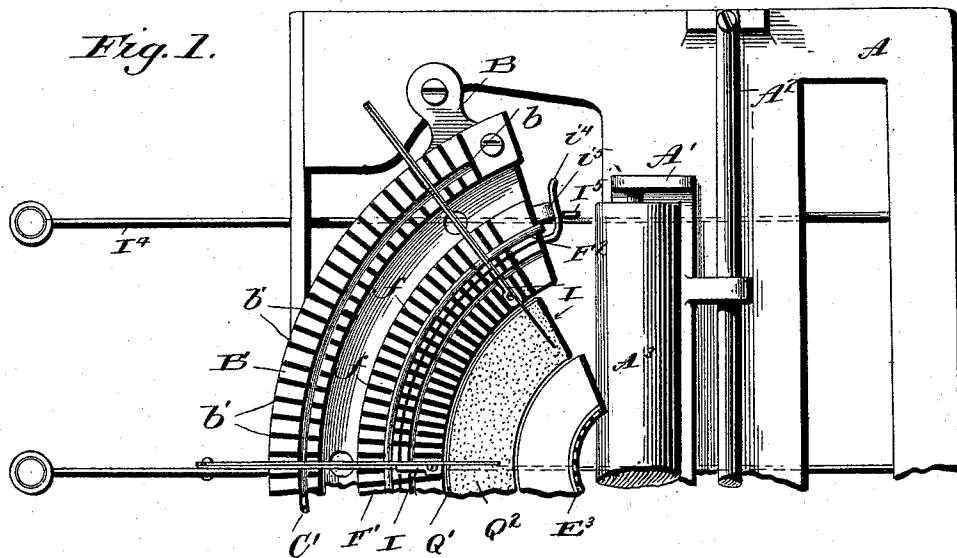


Fig. 2.

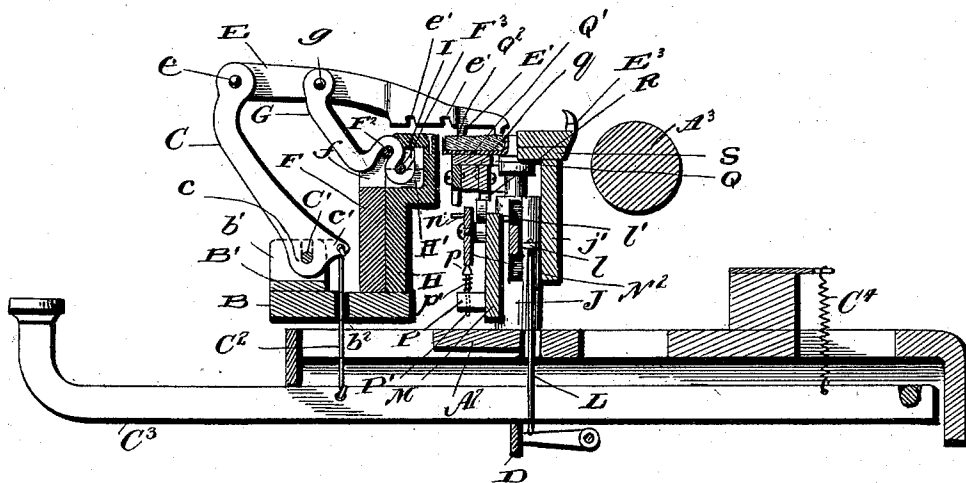
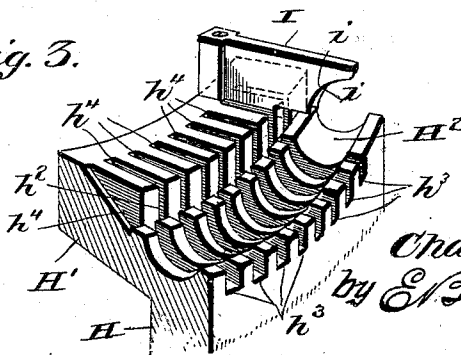


Fig. 3.



Witnesses:

L. C. Hills
E. A. Bond

Inventor:

Charles Spiro

by E. J. Stocking
Attorney

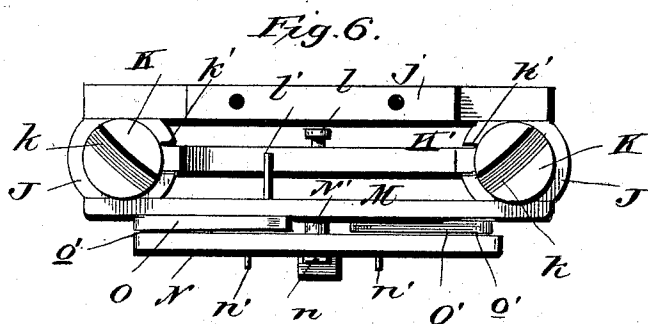
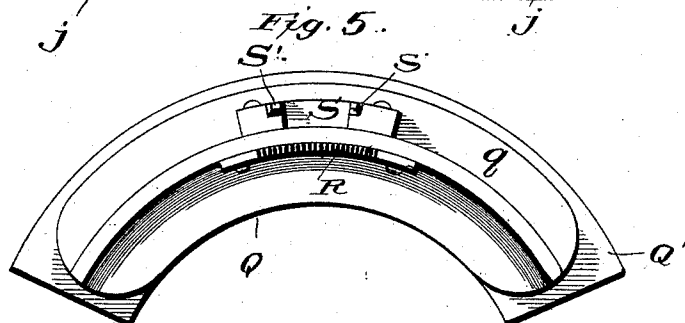
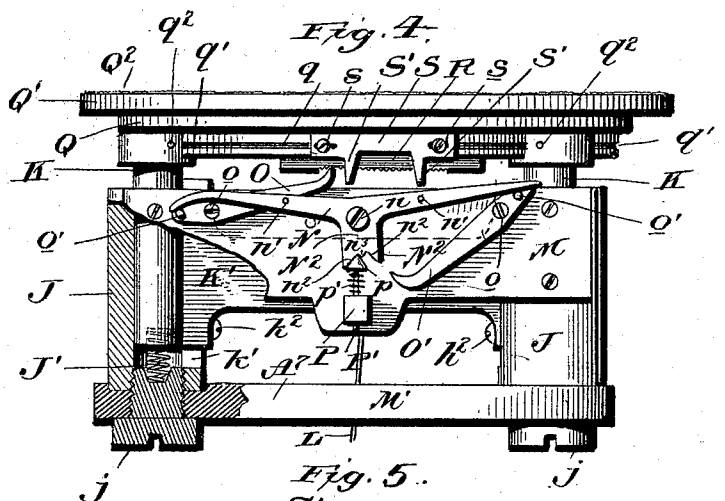
(No Model.)

4 Sheets—Sheet 2.

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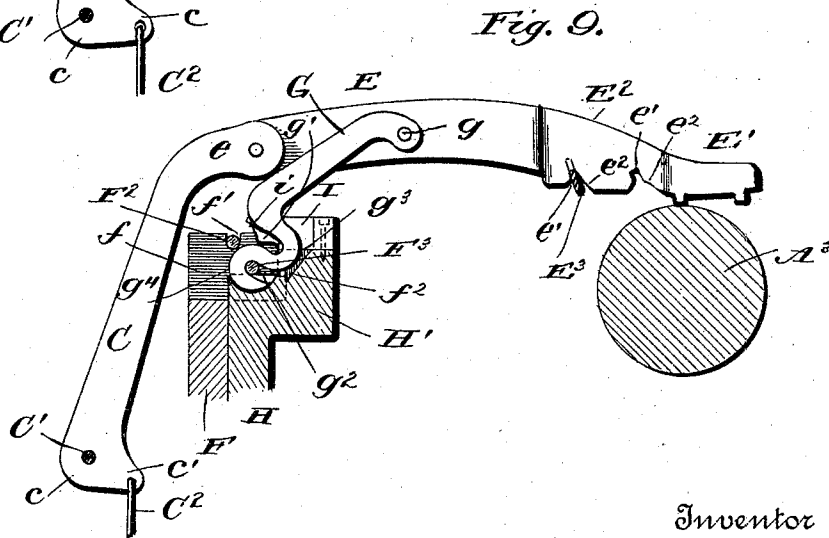
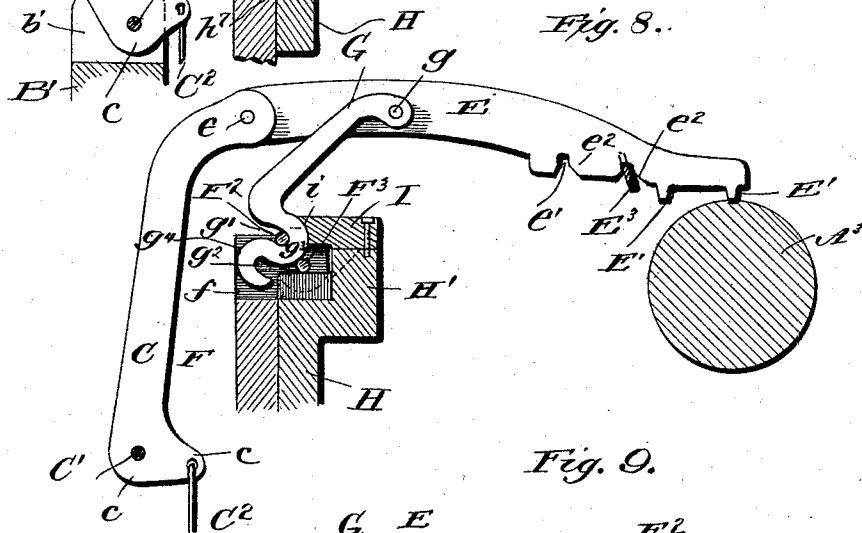
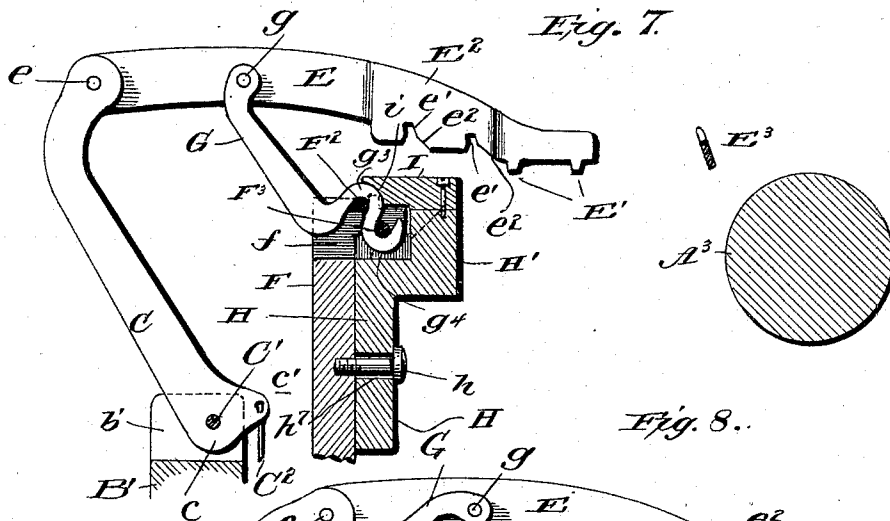
(No Model.)

4 Sheets—Sheet 3.

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Fig. 10.

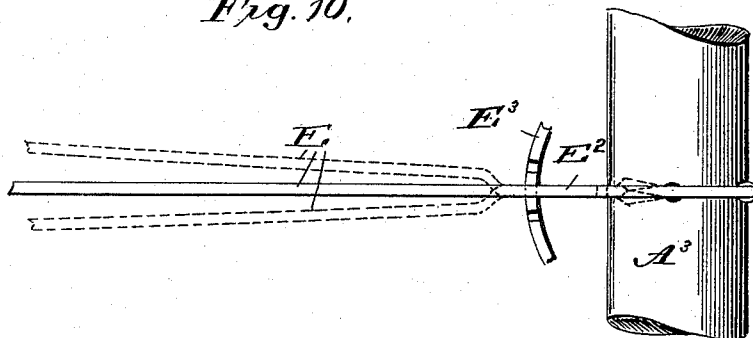


Fig. 11.

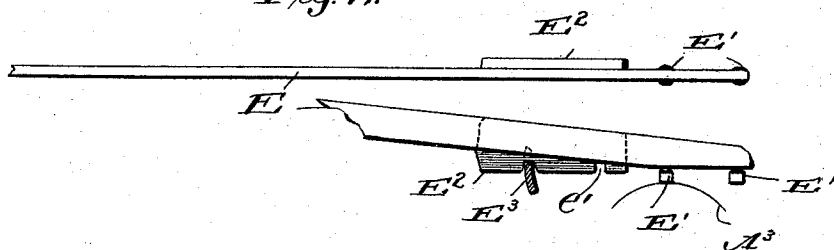


Fig. 12.

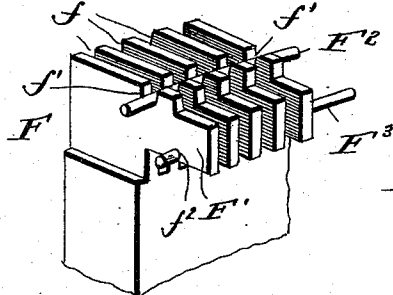
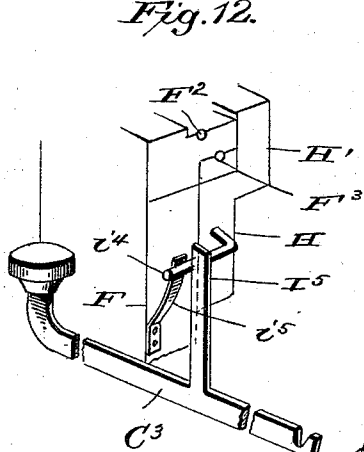


Fig. 13.

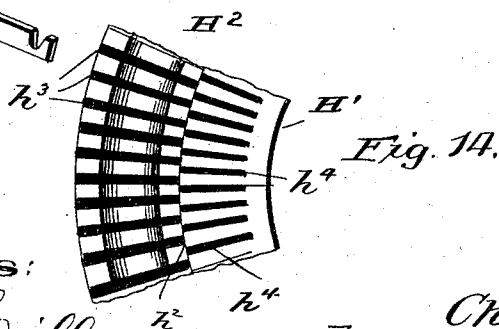


Fig. 14.

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UNITED STATES PATENT OFFICE.

CHARLES SPIRO, OF NEW YORK, N. Y.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 540,078, dated May 28, 1895.

Application filed March 24, 1894. Serial No. 504,999. (No model.)

To all whom it may concern:

Be it known that I, CHARLES SPIRO, a citizen of the United States, residing at New York, in the county of New York, State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain new and useful improvements in type-writing machines, and has for its objects among others to provide simple and efficient means for changing the inking pad or moving it at each depression of a key lever, with provision for automatically reversing the direction of movement thereof.

It has for a further object to provide novel devices and means for changing from upper to lower case and vice versa. I aim further at improvements in the details of construction, as will all be more particularly hereinafter pointed out.

Other objects and advantages of the invention will hereinafter appear and the novel features thereof will be specifically defined by the appended claims.

The invention is clearly illustrated in the accompanying drawings, which, with the letters of reference marked thereon, form a part of this specification, and in which—

Figure 1 is a detail in top plan showing sufficient of a type-writing machine to illustrate my present invention. Fig. 2 is a vertical cross-section of the same. Fig. 3 is a detail perspective, on a larger scale, of the inner plate or arc removed. Fig. 4 is a front elevation, with parts broken away, of the ink-pad support and the shifting mechanism. Fig. 5 is a bottom plan of the ink-pad on a larger scale. Fig. 6 is a top plan of the shifting mechanism and the ink-pad support. Fig. 7 is a diagrammatic view showing the manner of pivoting the type-bar. Fig. 8 is a similar view showing the parts in another position. Fig. 9 is a like view showing the parts in still another position. Fig. 10 is a top plan view of a group of type-bars, showing the offset arrangement. Fig. 11 shows in top plan and side elevation a modified form of the type-bar. Fig. 12 is a detail in perspective showing the means of moving the arc-shaped plate.

Fig. 13 is a perspective detail view of the front arc-shaped plate. Fig. 14 is a plan of the rear arc-shaped plate, showing the alternate arrangement of its slots.

Like letters of reference indicate like parts throughout the several views.

Referring now to the details of the drawings by letter, A designates the frame, A' the carriage, A² the carriage rod, and A³ the platen, all of known or approved construction.

Secured near the front of the frame is the arc-shaped plate B from the front of which rises the flange B' which is provided with a groove or channel *b* and with radial slots or slits *b'*.

C are the type-bar arms which are pivotally mounted in this flange, preferably upon a wire C' located and held in said groove or channel and forming the fulcrum for said arms, and the curved portion *c* of the arms working in the slots or slits as seen in Figs. 1, 2 and 7. The arms C each have a perforated lug or extension *c'* provided with a perforation in which is held one end of the rod or link C² which is connected at its other end to the key lever C³ which is mounted in the frame for movement in the usual manner.

C⁴ is a spring connecting the rear end of the key lever with a fixed portion of the frame in the ordinary manner.

D is the universal bail mounted in the usual manner for actuation by each and all of the key levers.

The upper end of each arm C is pivotally connected as at *e* with one end of a type-bar E which type-bar carries a plurality of type E', in this instance shown as two in number. Each type-bar is provided with as many notches *e'* as there are type on the bar, in this instance two, and these notches have a forwardly inclined wall *e²* as shown best in Figs. 7, 8 and 9. These notches co-operate with the lock-plate E³ which is secured in operative position between the platen and ink-pad as seen in Figs. 1 and 2 and which is provided with the arc-shaped upwardly-extending teeth as shown in Fig. 1, there being fourteen teeth and each adapted to receive three type-bars to lock the same. In order to adapt the type-bars for co-operation with the lock-plate in this manner I form one of the type-

bars without offset, or of a single thickness, as shown in Fig. 8, and the type-bars upon each side thereof I make with an offset E^2 to either side for the purpose of permitting the type-bar to reach the printing point in a straight line, while the locking portion of the bar is made to enter the lock-plate tooth by reason of the offset. This offset is formed either on the bar or it may be by a plate secured to the type-bar, such form being shown in Fig. 11. In Figs. 7 and 9 this offset is seen at E^2 and this offset alternates, that is, upon the one on the right of the center type-bar of each set it is on one side, and on that on the left it is on the other side. Thus each set comprises a bar without offset and two offset bars.

The rods or links C^2 work through vertical slots b^2 in the plate B as seen in Fig. 2, while rising from the plate B near its rear edge is the arc-shaped plate F which at its upper end terminates in a horizontal flange F' which is provided with radial slits or slots f as seen best in Fig. 1. The upper face of this flange is provided with a surrounding channel or groove f' in which is located the wire F^2 , while upon its under face is a channel or groove f^2 in which is held the wire F^3 as seen in Figs. 7, 8 and 9. The slits or slots in the plate F extend in its vertical portion below the bottom face of the flange F' as seen in Figs. 7, 8 and 9 for a purpose which will soon be made apparent.

G is a link pivotally connected at one end with the type-bar between its ends as seen at g while its other end is of peculiar construction. It is formed with a double lateral curved portion which extends substantially at a right angle from the body portion of the link and this portion G' is formed with the two slots g' and g^2 extending one into each curve and each open-ended as seen in the various views of the drawings. The curved faces g^3 and g^4 serve as the bearings upon which the link moves, and, in conjunction with the wires F^2 and F^3 , constitute the fulcrums of the same. As shown in Fig. 7 both of the wires are within the circle described by the curved end portion of the link in its movements. In Fig. 9 the relative positions of the parts have been changed, by mechanism soon to be described, so that one of the wires is within the circle while the other is outside the circle, as will be readily seen upon reference to said Fig. 9.

In Fig. 7 the type-bar is shown in its forward position, that is, that which it assumes when not printing, while in Fig. 8 it is shown as in its other position, that which it assumes when the type is in position to print on the platen.

H is the movable arc-shaped plate. It is held to the vertical portion of the plate F by suitable means allowing it to have the necessary movement. For instance, in the present case, it is shown as held in place by screws h which pass through horizontally elongated slots h' in the vertical portion of the plate H and are screwed into the vertical portion of

the plate F. See Fig. 7. This plate H is provided at its upper end with a lateral portion H' which has the curved ribbed and slotted channel H^2 as shown best in Fig. 3 and in which the wire F^3 lies and beyond this curved channel with the vertical shoulder h^2 as seen in Fig. 3. The curved channel is formed with the radial slots h^3 and the raised portion in said shoulder is formed with radial channels or slots h^4 the slots or channels h^3 and h^4 alternating as seen in Figs. 3 and 14. Upon the upper face of the lateral portion H' are secured the blocks or stops or fulcrum seats I which may be secured thereto in any suitable manner as for instance by the screws as shown, there being designed to be one of these over each partition or wall between two slots or channels h^4 in the portion H' and these blocks have their outer ends formed with an undercut curve i as shown best in Fig. 3, which is the same curve as that of the channel H^2 as shown best in Fig. 3 where one of the said blocks is shown in position.

The plate H is mounted for movement in the arc of a circle and for this purpose I, by preference, employ a special key I^4 seen in Fig. 1 and which is suitably pivoted beneath the frame and beneath the universal bail, and from this lever projects the vertical arm I^5 as seen best in Fig. 1 which is adapted to engage the arm i^4 projecting from the end of the plate H as seen best in said Fig. 1 so that when the special key lever is depressed this vertical arm will engage the arm i^4 and move the plate H in the direction of the arrow in Fig. 1, the parts being designed to be returned to their normal position when the key lever is released by a spring i^5 secured preferably to the vertical end portion of the plate F and arranged to bear against the arm i^4 as seen in Fig. 1.

With the parts constructed and arranged substantially as above set forth the operation of this part of the invention is as follows: Normally the parts are in position to print only lower case letters or characters. With the parts in this position the depression of a key lever will bring the parts into the position in which they are shown in Fig. 8, the link G turning on the wire F^2 as its pivot which works in the slot g' of the curved portion of the link. In this position the curved end of the link works in the radial channels or slots h^3 of the flange of the plate H and the undercut curve of the blocks I serve in conjunction therewith to determine the movement of the link and consequently of the type-bar. When it is desired to print an upper case character the key lever I^4 is depressed which brings the vertical arm I^5 against the arm i^4 and moves the plate H in the direction of the arrow in Fig. 1. This shifts the relative positions of the plates F and H so that the radial slots of the flanges of the said plates are coincident as seen in Fig. 1 where the parts are supposed to be in such position, the special key lever having been depressed. Now

a depression of a key lever will throw the type-bar over into the position in which it is shown in Fig. 9 the plate H having been moved so that the blocks I are no longer in the path of the links and the fulcrum or pivot is changed from the wire F^2 to the wire F^3 as seen in said Fig. 9 and the extreme curved end of the link rides upon the upper curved face of the channel H^2 , that is, upon the upper faces of the partitions between the channels or slots h^3 and these being coincident with the slots or channels h^4 the link is not restricted in its movement by the block I but moves through the slot or channel h^4 which gives it the additional amount of throw to allow it to so move that the other character on the type-bar is brought into the proper position over the platen. As soon as pressure is removed from the key lever I^4 the spring i^5 returns the parts to their normal position.

The mechanism for moving the ink-pad is shown detached in Figs. 4, 5, and 6, and in position in Figs. 1 and 2. On an extension A' of the frame of the machine are mounted the upright hollow standards J within which are confined springs J' as seen in Fig. 4 which find a bearing at their lower ends upon the upper ends of the screws or bolts j which are threaded into the standards as shown in Fig. 4. To the rear face of these standards is attached a plate j' upon which is secured the lock-plate E^3 as seen best in Fig. 2.

K are posts mounted to reciprocate vertically within the hollow standards J as seen in Figs. 4 and 6, and resting upon the springs J' . The upper ends of the posts are provided with enlarged heads in which are formed slots k as seen best in Fig. 6 which are formed upon curved lines as shown for a purpose which will soon be explained. These posts are connected by a cross plate K' which works in slots k' in the adjacent sides of the standards J, the cross plate being secured to the posts in any desirable manner, as by the screws k^2 . Seen in Fig. 4. This cross plate and consequently the posts are drawn downward by means of a rod, link or analogous connection L which is connected at its upper end with a transverse screw or projection as seen best in Figs. 2 and 6, while its other end is connected with the universal bail as seen in Fig. 2. This projection l may be of any form. The cross-plate is limited in its upward movement by a lateral pin or projection l' projecting from the plate or bar M which is secured to the front face of the standards J as seen in Figs. 2, 4, and 6.

Pivotaly mounted on the plate M is the oscillating lever N which is pivoted at its center as seen at n and its two arms extend substantially horizontally as seen best in Fig. 4 and each is provided between its end and pivot with a laterally projecting pin or stud n' as seen best in Fig. 6. This lever is held at a distance from the plate M by a spacing block or collar N' as seen best in Fig. 6 to provide space between the said plate and le-

ver for the two pawls O and O' which are pivoted near the ends as shown at o and between the pivot and the end of the short arm of each pawl is a laterally-projecting stud or pin o' as seen best in Fig. 4, the other ends of the pawls being slightly up-turned as seen in Fig. 4 and pointed to engage with a rack-bar soon to be described. The lever N has a portion N^2 depending from its center as shown best in Fig. 4 and the bottom face of this portion is formed with the inclined walls n^2 oppositely disposed as seen in Fig. 4 and between these inclined walls is a slight projection n^3 as is also shown in said Fig. 4. Projecting from the plate M at a point below and in vertical line with the pivot of the lever N is a stud P in which is mounted for vertical reciprocation a bolt P' the upper end of which terminates in a conical head p as shown best in Fig. 4 and between the shoulder of the head and the top of the stud, around the bolt is a spring p' all as shown in Fig. 4.

Q is the ink-pad carrier. It is provided upon its upper face with a holder Q' for the ink-pad which may be of any desired character and held in the holder in any suitable manner.

Q^2 is the ink-pad.

The carrier, holder and pad are arc-shaped as seen in Figs. 1 and 5, and upon the under side of the carrier is a rib or flange q which is provided with a groove or channel q' as seen best in Fig. 4. This rib or flange is fitted to move freely in the curved slots k of the heads of the posts K as shown in Fig. 4, and the carrier and its attached parts are prevented from vertical displacement by means of screws q^2 held in the heads of the posts and entering this groove or channel so as to allow of movement of the carrier in the slots of the heads of the posts but not vertically with relation thereto. To remove the carrier these screws are removed. Upon the inner face of the rib or flange q of the carrier is secured a rack-bar R the teeth of which are very fine as seen in Fig. 4, and upon the outer face of this rib or flange is the plate S which is rendered adjusted by means of the slots s therein through which pass the securing screws as seen in Fig. 4, and this plate has depending therefrom the lugs or projections S' as shown in Figs. 2 and 4.

The operation is as follows: One of the pawls O or O' is at all times in operative contact with the rack-bar R, while the other hangs down in the position shown in Fig. 4. At each depression of a key lever the cross-plate K' which carries the ink-pad actuating mechanism is drawn downward and the ink-pad carrier is moved one tooth to the right or left, according to which pawl is in engagement with the rack. Each depression of a key lever moves the carrier in the one direction until the projection S' at the end of the plate S toward which the carrier is moving comes in contact with the pin or projection n' on the double-armed lever N, which serves to

throw that end of the lever downward and the other end up. This reverses the pawls, that is, the one that was before up falls down and the other is thrown up. As the lever is shifted the conical head of the bolt P' is automatically shifted into contact with the inclined wall upon the opposite side of the teat n^3 . Thus the ink-pad is automatically moved at each depression of a key lever and the reversal of such movement is also automatically governed.

As shown in Fig. 4, the projection S' at the right is vertically in line with the pin n' so that upon the next depression of the carrier the said projection S' will engage the pin n' and perform the function stated, it being understood that, as shown in this view, the carrier is in its elevated position but the amount of movement of the carrier vertically is shown to be more than enough to bring the projection S' into contact with the pin n' .

Modifications in detail may be resorted to without departing from the spirit of the invention or sacrificing any of its advantages.

What I claim as new is—

1. In a type-writing machine, the combination with a fulcrum seat mounted for movement horizontally in the arc of a circle, of a fulcrum constructed and arranged to be moved a greater or lesser distance according to the position of said seat, substantially as specified.

2. In a type writing machine, a type bar connection having oppositely-disposed curved fulcrumed faces at one end the other end being adapted for pivotal connection with a type bar, substantially as specified.

3. In a type writing machine, a type bar connecting link having oppositely-disposed curved fulcrum faces and oppositely-disposed open-ended slits with curved bases near one end the other end of said link being adapted for pivotal connection with a type bar, substantially as specified.

4. The combination with a type bar carrying a plurality of type and mounted for substantially horizontal movement, of a link mounted thereon and having oppositely-disposed curved fulcrum faces and fulcrum rods in different horizontal and vertical planes to cooperate with said curved fulcrum faces, substantially as specified.

5. A type bar mounted for substantially horizontal movement and a movable fulcrum, combined with a variable fulcrum seat mounted for movement horizontally in the arc of a circle for changing the limit of movement of said fulcrum and said bar, substantially as specified.

6. A type bar pivotally mounted for substantially horizontal, reciprocatory movement and carrying a plurality of type and provided with a plurality of notches to conform to the spaces between the type combined with a link mounted on said type bar and constructed for cooperation with a variable fulcrum seat mounted for horizontal movement in the arc of a circle, substantially as specified.

7. A pivoted type bar mounted for substantially horizontal movement and a plurality of type and a corresponding number of notches spaced the same as the type combined with a lock plate for cooperation with said notches to hold the type bar against lengthwise movement when making an impression, a variable fulcrum mounted for movement horizontally in the arc of a circle and a link mounted on the type bar and constructed for cooperation with the variable fulcrum, substantially as specified.

8. The combination with a lock-plate, of type bars mounted in sets of three with the central bar having plain sides and the outside bar having oppositely-disposed lateral offset portions, substantially as specified.

9. The combination of a type-bar, a type-bar-arm pivotally connected therewith, a link pivotally connected with the type-bar, and means movable horizontally in a curved path for changing the fulcrum of said link, as set forth.

10. The combination of a type-bar, a link pivotally connected therewith, two fulcrums for the link, and means movable horizontally in a curved path for changing the same so that either may serve therewith, as set forth.

11. The combination of a type-bar, a link pivotally connected therewith, two fulcrums in different planes, a stop, and means for moving the same to change the fulcrum and limit of movement of the link, as set forth.

12. The combination of a type-bar, a link pivotally connected therewith and having oppositely-disposed curved faces and open-ended slots, two fulcrums for engagement with the curved faces and slots, a stop, and means for moving the same to change the fulcrum and limit the movement of the link, as set forth.

13. The combination of a type-bar, a link pivotally connected therewith, two independent fulcrums for the link, a stop with another curved undercut for cooperation with the link, and means for moving the same to change from one fulcrum to the other, as set forth.

14. The combination with a type-bar and a link pivotally connected therewith and having curved faces, of a movable plate having radial clearance slits and fulcrum seats, with means for moving said plate, as set forth.

15. The combination of a type-bar, a type-bar-arm pivotally connected with one end thereof, and a link pivotally connected with the type-bar in horizontal line with the pivot of the said arm, and a variable fulcrum for said link, as set forth.

16. The combination of a type-bar, a link pivotally connected therewith, two independent fulcrums for the link, and a movable plate provided with stops and two sets of alternately-arranged radial slits, as set forth.

17. The combination of a type-bar, a link pivotally connected therewith, two independent fulcrums for the link, a movable plate having a rounded channel with slits and parti-

tions, and another set of slits alternating therewith, fulcrum seats on said plate, and means for moving the plate, as set forth.

18. A radially slitted plate carrying a fulcrum rod combined with a movably-mounted plate having a horizontal flange with alternately-arranged alternate slots and carrying another fulcrum rod, substantially as specified.

19. The combination of a movably-mounted plate having a flange with two sets of alternately-arranged radial slits, and stops coincident with one set and alternating with the other and type bar links having one end pivotally held in said slots, as set forth.

20. The combination with a stationary plate having radial slots, of a movably mounted plate having a flange with alternately arranged slits, a link pivoted in the first mentioned plate and type bar links having one end pivotally held in said slits, substantially as specified.

21. The combination with a stationary plate having radial slits and two independent fulcrums, of type-bar-links pivotally mounted in said slits, a movably-mounted plate with alternately-arranged radial slits, means for moving the said plate, and stops on the movable plate to cooperate with the links, as set forth.

22. The combination of a type bar connecting link having at one end a lateral portion with oppositely-disposed curved faces and open ended slots, with two independent fulcrum rods for cooperation with said link, the rods engaging in the slots and bearings against the rounded faces of the link, and means for changing the fulcrum of the link from one rod to the other, as set forth.

23. A type-bar link having at one end a lateral portion with open-ended slots and oppositely-disposed curved fulcrum faces, as set forth.

24. The combination with a type-bar link supporting plate having radial slits, and two independent fulcrum rods, of a movable plate having a flange with radial slits normally out of line or non-coincident with those of said supporting plate, and means for moving the movable plate to bring the slits into line or coincident, as set forth.

25. A fixed plate with radial slits and two fulcrum rods upon different planes, of a movable plate with radial slits, means for moving said plate, a connecting link and stops on the movable plate, as set forth.

26. A type-bar link having a lateral portion with oppositely-disposed curved faces an open-ended slots, combined with means for changing the bearing from one face and slot to the other, substantially as specified.

27. The combination with a type-bar-link having oppositely-disposed curved faces and oppositely-extending open-ended slots, of two fulcrum rods disposed in different planes, and means for changing the bearing from one face and slot to the other, as set forth.

28. The combination with a type-bar link having oppositely-disposed curved bearing faces and open-ended slots, of two independent fulcrum rods in different planes, and a movable plate carrying a stop having a curved face to cooperate with one of the curved faces of the link, as set forth.

29. The combination with the plate with its radial slots and wires in different planes, of the link with its curved faces and open-ended slots, and the plate having a flange with radial slits and mounted for movement in the arc of a circle, as set forth.

30. The combination with the plate with its radial slots and wires in different planes, of the link with its curved faces and open-ended slots, the movable plate having radial slits and mounted for movement in the arc of a circle, and stops on the movable plate, substantially as specified.

31. The combination with the fixed plate with a flange with radial slits and a groove upon its upper and under faces, and the wires in said grooves, of the type bar and connecting link the movable plate with its radial slits, and the stops on the movable plate, as set forth.

32. The combination with the fixed plate with its flange and radial slits, of a type bar, a connecting link the movable plate with its slits and stops, the arm projecting from the movable plate, and a lever having a portion to engage said arm to move the plate, as set forth.

33. In a type-writer, a yieldingly-supported ink-pad support combined with an ink pad carrier mounted thereon for movement in a vertical plane and in a curved path horizontally, as set forth.

34. In a type-writer, an ink-pad mounted for vertical movement and for movement in a horizontal plane in the arc of a circle, as set forth.

35. In a type-writer, an ink-pad mounted for vertical movement and for movement in reverse directions in the arc of a circle, as set forth.

36. A yieldingly-mounted ink-pad-carrier-support, combined with an ink-pad carrier mounted for movement thereon in the arc of a circle, as set forth.

37. An ink-pad carrier mounted for yielding vertical movement and provided with a rack-bar and mounted for step-by-step movement in the arc of a circle, as set forth.

38. An ink-pad carrier mounted for vertical yielding movement and for actuation in the arc of a circle by the universal bail, as set forth.

39. The combination with the universal bail, of an ink-pad carrier connected therewith and mounted for vertical and horizontal movement, as set forth.

40. The combination with the universal bail, of an ink-pad carrier mounted for actuation by the said bail, and mechanism actuated

by the movement of the carrier for reversing its direction of movement, as set forth.

41. The combination with the vertically-movable support, of the ink-pad carrier 5 mounted therein for movement in the arc of a circle, a double-armed lever and feed pawls actuated by the movement of the carrier, as set forth.

42. The combination with the yieldingly 10 supported vertically-movable posts, of the ink pad carrier mounted therein for movement in a horizontal plane, and interposed devices actuated by the vertical movement of the carrier to feed the same, as set forth.

43. The combination with the yieldingly- 15 supported posts with heads with curved slots, of the ink-pad-carrier having a flange or rib engaged in said slots, as set forth.

44. The combination with the vertically- 20 movable yieldingly-supported posts having curved slots at their upper ends, of the ink-pad carrier having a depending rib with groove, and means engaging said groove to prevent vertical displacement of the carrier, 25 as set forth.

45. The combination with the carrier provided with rack-bar and depending lugs, of the double-armed lever with lateral projections, and the two pawls having lateral pins, 30 as set forth.

46. The combination with the carrier provided with a rack-bar and depending lugs, of the double-armed lever having lateral pins, to be engaged by said lugs, and the pawls mounted to engage said rack-bar and having lateral 35 pins to be engaged by the arms of the lever, as set forth.

47. The combination with the yieldingly- 40 supported carrier mounted for movement in the arc of a circle, of the two-armed lever the pawls, the rack-bar and lugs and lateral pins on the lever and pawls, and a connection be-

tween the carrier-support and the universal bail, as set forth.

48. The combination with the ink-pad-car- 45 rier with its rack-bar and depending lugs, of the double-armed lever with its pins, the pawls with their pins, and the vertically-movable pin with conical head, as set forth.

49. The combination with the tubular up- 50 rights having slots upon their adjacent faces, of the posts mounted on springs in said up-rights, a cross-plate connecting the posts, and an ink-pad-carrier mounted on the posts, as set forth. 55

50. An ink-pad-carrier mounted for vertical and horizontal movement in the arc of a circle, combined with means for automatically reversing the horizontal movement thereof, 60 as set forth.

51. A yieldingly-supported ink-pad-carrier 60 mounted for vertical yielding movement and for movement in a horizontal plane in the arc of a circle, combined with a step-by-step feed acting on said carrier to feed the same, as set 65 forth.

52. In a type writer, the combination with type bars and bearings, and the curved plate having fulcrum rods of a type bar connecting the link having oppositely disposed curved 70 faces, adapted to cooperate with said fulcrum rods substantially as specified.

53. In a type writer, the combination with a type bar and the bearings and the curved 75 plate having fulcrum rods, of a type-bar connecting link having rounded faces and open-ended slots, adapted to cooperate with said fulcrum rods substantially as specified.

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

CHARLES SPIRO.

Witnesses:

J. FREUDENTHAL,
J. E. LEVY.