J. H. PILLINGS.

MECHANISM FOR AUTOMATICALLY OPERATING TYPEWRITER LEVERS AND THE LIKE.

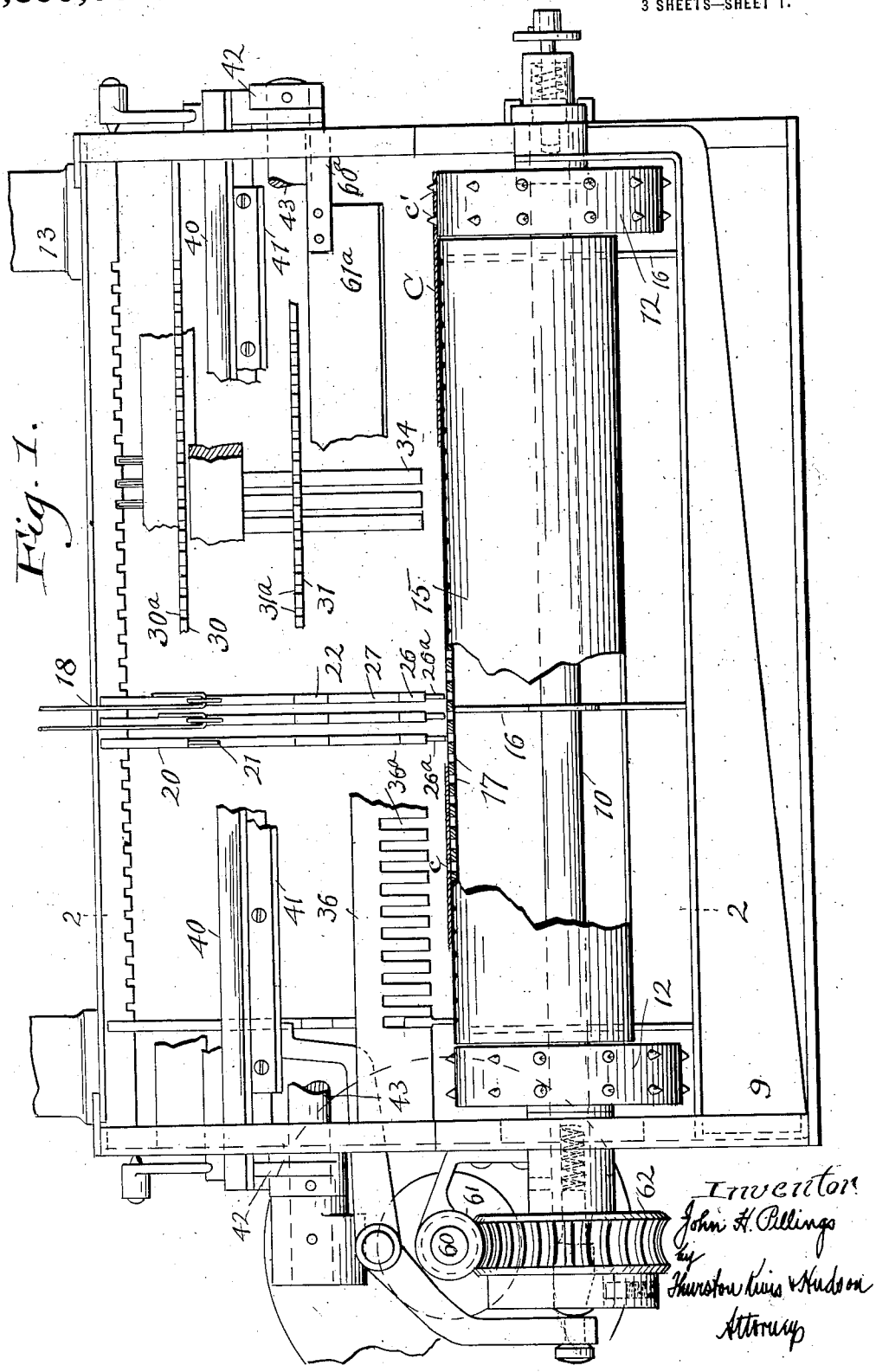
APPLICATION FILED FEB. 7, 1921.

1,399,365.

Patented Dec. 6, 1921.

3 SHEETS—SHEET 1.

Fig. 1.



Inventor
John H. Pillings
by
Thurston Kins & Hudson
Attorneys

J. H. PILLINGS.

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3 SHEETS—SHEET 2.

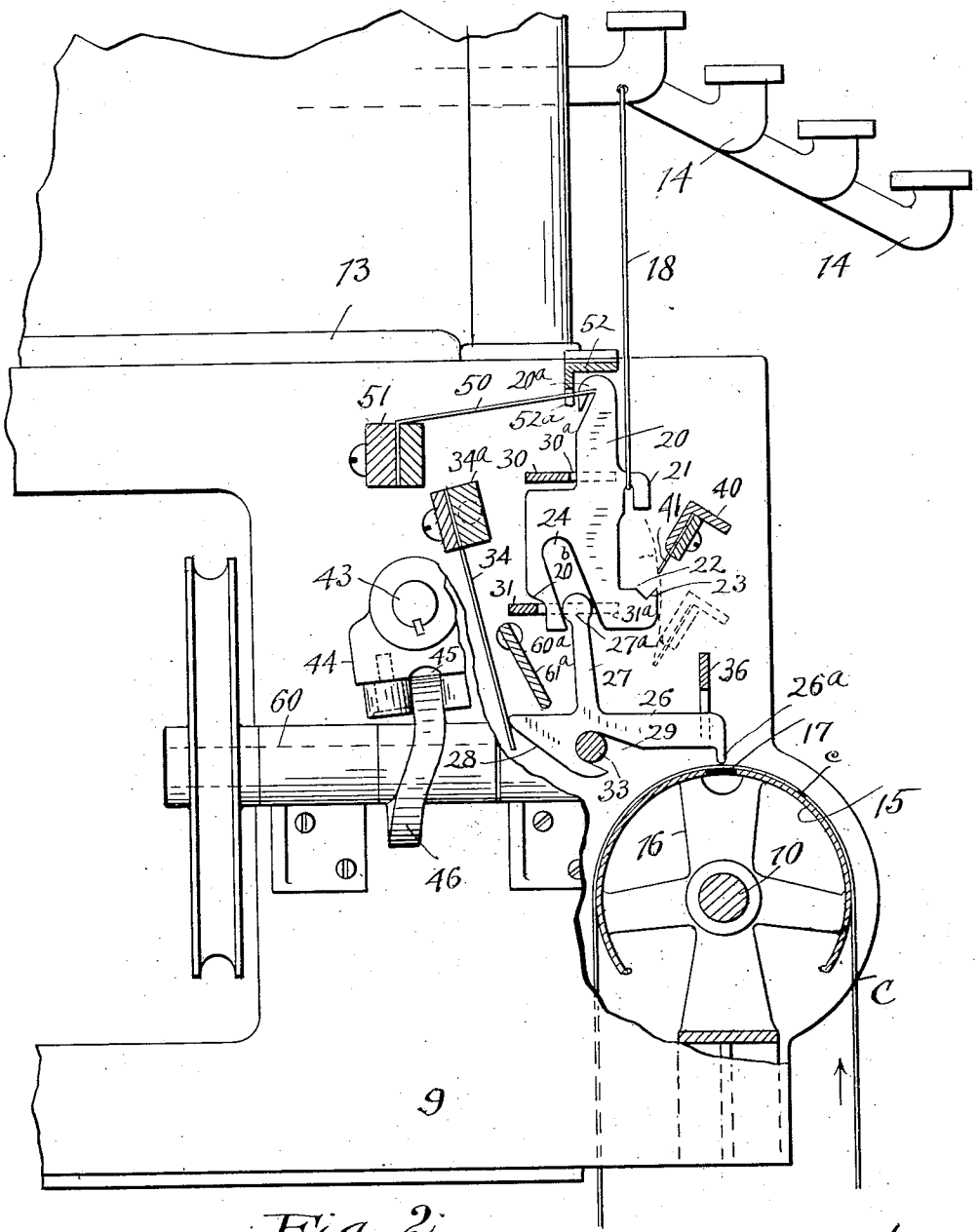


Fig. 2.

Inventor:
John H. Pillings
by Thurston Kiwis & Anderson
Attorneys

J. H. PILLINGS.

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3 SHEETS—SHEET 3.

Fig. 3.

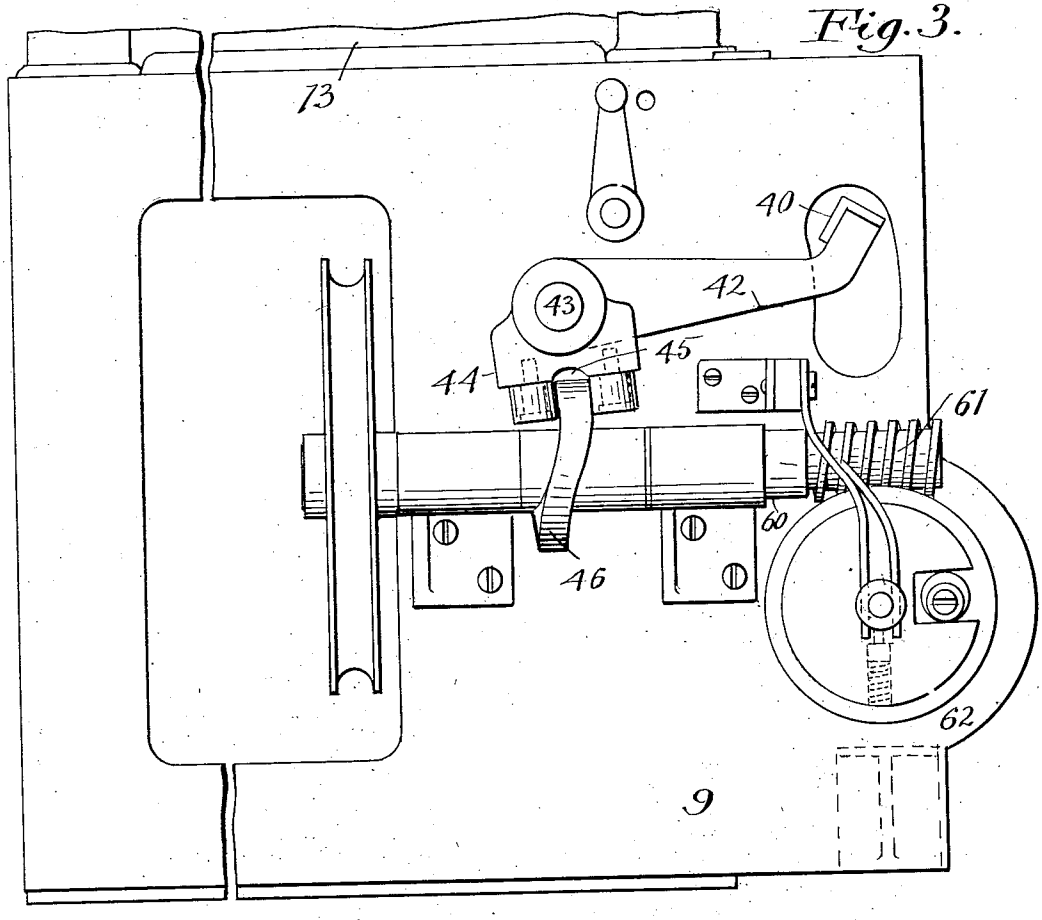
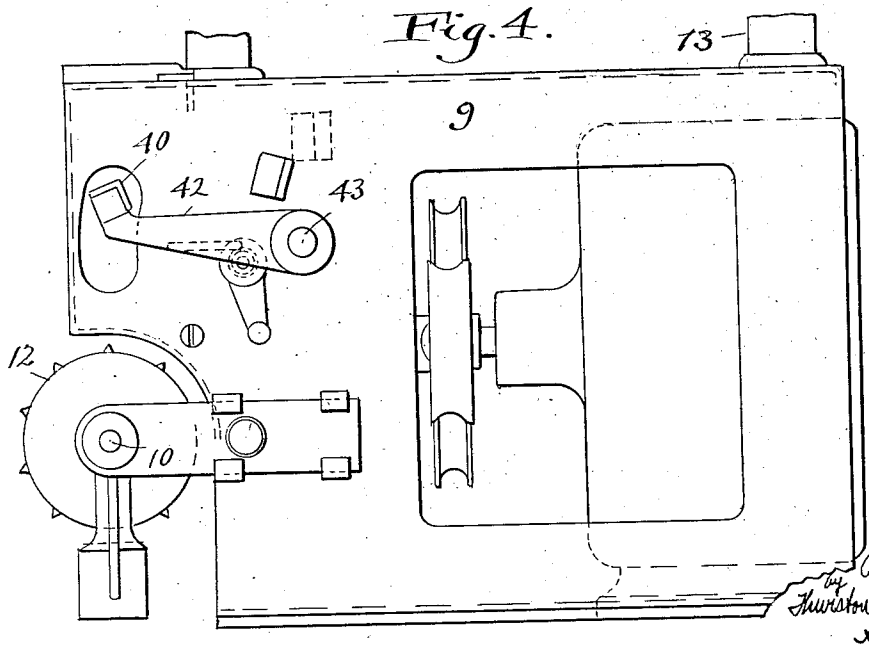


Fig. 4.



Inventor
John H. Pillings
by Thurston, Kuis & Hudson
Attorneys

UNITED STATES PATENT OFFICE.

JOHN H. PILLINGS, OF HAMILTON, OHIO.

MECHANISM FOR AUTOMATICALLY OPERATING TYPEWRITER-LEVERS AND THE LIKE.

1,399,365. Specification of Letters Patent. Patented Dec. 6, 1921.

Application filed February 7, 1921. Serial No. 442,996.

To all whom it may concern:

Be it known that I, JOHN H. PILLINGS, a citizen of the United States, residing at Hamilton, in the county of Butler and State of Ohio, have invented a certain new and useful Improvement in Mechanism for Automatically Operating Typewriter-Levers and the like, of which the following is a full, clear, and exact description.

This invention relates to novel mechanism for automatically operating, in sequence as determined by perforations in the controller strip, a plurality of levers or other devices, such for example, as key levers and other parts of a typewriting machine.

In all prior mechanisms for automatically operating typewriters, the perforated controller strip is supported upon a rotatable drum or cylinder which, as it rotates, performs some function in connection with the actuation of the mechanisms which are selectively determined by perforations in the controller strip.

It is believed that the present invention is unique in that the various lever operating mechanisms are so constructed that their selective operation will take place without assistance from the controller supporting device, wherefore the controller supporting device may be a very cheap stationary member which need have no especial peculiarities of construction except such as enable it to properly support the perforated controller strip without interfering with the movements of the mechanisms in such sequence as is determined by the perforations in the controller strip.

The invention consists in the construction and combination of parts shown in the drawings and hereinafter described and pointed out definitely in the appended claims.

In the drawings, Figure 1 is a fragmentary front elevation of the mechanism, some of the parts being broken away in section and many duplicate parts being omitted entirely; Fig. 2 is a sectional side elevation, for example, in the plane of line 2—2 on Fig. 1; Fig. 3 is a side view from the left side of the machine; and Fig. 4 is a side elevation of the right side of the machine.

Referring to the parts by reference characters, 10 represents a rotatable controller actuating shaft which extends transversely and is mounted on suitable bearings. It may be rotated at a suitable rate by any suitable mechanism, as for example, a worm 61 on the driving shaft 60 and a worm wheel 62 on the shaft 10. Sprockets 12 are secured to this shaft 10 near its end in position such that the sprocket teeth will engage the perforations c' in the controller strip C, near the edges thereof and thereby move said controller strip slowly along over the supporting member 15 by which it is supported. A controller supporting member 15 extends between the two sprockets, and is preferably in the form of an incomplete cylindrical shell which may be made of sheet metal, and is held in position coaxial with shaft 10 by being attached to spider arms 16 which are parts of the fixed frame work 9 of the machine. In the top of this shell is a transversely extended row of holes 17, there being one hole for each of the operating mechanisms by which the various typewriter levers and other mechanism of the typewriter may be actuated. These holes may all be merged together to form a groove or slot extending from one end of the shell to the other because the parts of the shell between the holes perform no function; also each hole may be elongated in the opposite direction to any desired extent. The machine as organized is intended for use in cooperation with an ordinary typewriter machine 13 which is to be secured on top of the frame work 9 of the operating mechanism therefor. 14 represents the key levers of this typewriting machine.

Associated with each of the levers 14 or other levers to be operated is a combination of mechanisms for operating the same. It is in these mechanisms the present invention resides; and they are all alike, and each is operable independently of the others. Each of these mechanisms includes a thin plate 20 which stands in an upright position in a guideway formed by slots in the front edges of two fixed guide bars 30, 31. These guide bars extend from one side of the machine frame to the other, and are fixed at their ends. In their front edges are a plurality of slots 30^a, 31^a, each slot 30^a in one bar being associated with slot 31^a in the other arranged in the same vertical plane. Each of the plates 20 is as before stated projected into a slot in each of the bars 30, 31, and is thereby permitted to move vertically, and to be displaced forwardly, but is not permitted to move in any other direction. Each of the plates 20 is provided with a hook 21 for engagement with a link 18 which at its

upper end has an operative connection with one of the typewriter levers 14. This plate has also adjacent its lower end a forwardly projecting finger 22 in the upper edge of which is the V-shaped notch 23. Extending up from the bottom of the plate is a slot 24, which is rearwardly inclined.

Associated with each of the plates 20 is a lever 26 which is pivotally mounted on a fixed transversely extended rod 33. This lever has at its forward end a downwardly extended prong 26^a which normally rests upon the unperforated surface of the controller strip C which passes over the controller supporting shell 15, each prong 26^a being disposed over one of the holes 17 in said shell. This forwardly extended arm of the lever 26 projects through one of many slots 36^a which extend upward from the lower end of a fixed guide bar 36 and is thereby held against lateral displacement. The lever 24 has an upwardly extended arm 27 whose upper end 27^a is rounded, and projects into and has a nice sliding fit in the inclined slot 24. The lever 26 has likewise a rearwardly extended arm 28 with which a slightly tensioned flat spring 34 engages in such wise as to impart to the lever 26 a tendency to rock in the direction which will carry its front end downward, and also a forward tendency such as will hold the lever in operative engagement with the rod 33. For convenience in assembling and disassembling the mechanism the lever 26 has in its lower edge an upwardly extended rearwardly inclined slot 29 in which the rod 33 lies.

40 represents a transversely extended horizontal depressor bar carrying on its lower edge a blade 41 for engagement in the notches 23 in the forwardly projecting finger 22 on all of the plates 20. This depressor bar when the machine is in operation is moved rapidly up and down. This movement may be produced by any suitable mechanism; but in the construction shown is produced by the following mechanisms: The depressor bar has secured near its ends two lever arms 42 each of which is attached to a rock shaft 43, which rock shaft carries a downwardly extended arm 44 in the lower edge of which is a slot 45 which fits over a cam 46 secured to constantly rotating shaft 60. As this shaft turns the cam will by its action on arm 44 rock shaft 43 and thereby impart to the depressor bar the oft repeated up and down movements thereof. The fingers 22, when the plates 20 are in their normal positions are behind the path of the beads 41.

It will of course be understood that the perforated controller strip C, when ready for use, has a plurality of perforations *c* arranged in longitudinally extended rows, placed so that the perforations in each row will pass beneath the prong 26^a of the associated lever 26.

The operation of the described mechanism is as follows: When a perforation in the controller strip comes to a position such that it is beneath one of the prongs 26^a and over one of the holes 17 in the shield, the lever 26 carrying said prongs will rock and the prong will pass down through the perforation in the controller strip and enter hole 17, being impelled to so move by the spring 34. As this lever does so rock, its upwardly extended arm 27 will swing forward and in so doing will displace the associated plate 20 forward, thereby bringing beneath the edge of the blade 41 the notch 23 in the forwardly projecting finger 22 of said plate.

When now the depressor bar 40 makes its next downward movement its blade 41 will engage the notch 23 of the forwardly displaced plate 20, and will move that plate down, whereby through link 18 the corresponding key lever 14 will be moved down. During this downward movement of the plate 20 the inclined slot 24 thereof will by engaging the rounded upper end 27^a of arm 27 move said arm rearwardly, thereby causing lever 26 to so rock upon its pivot as to lift its prong 26^a above and clear of the controller strip. The described action takes place so quickly that the prong 26^a will go through the hole *c* in the perforated controller strip and then be lifted out of said hole before the edge of the hole engages the prong.

When the depressor bar 40 moves upward it permits the plate 20 to move upward, and said plate is so moved by the action of a spring 50 thereon, said spring being a flat spring which is secured to a fixed bar 51 and engages a hook 20^a on the upper end of the plate 20.

When plate 20 reaches its normal position it will be stopped by the engagement of its upper end with the overhanging part of a fixed angle bar 52 which angle bar has in the lower edge of its vertical member a plurality of slots 52^a through each of which a spring 50 engages whereby said spring is guided and held in operative engagement with the hook of an associated plate.

A feature of construction of each of the plates 20 which is certainly advantageous and possibly necessary to the successful operation of the described mechanism is the rearward extension 20^b of the plate, when in its normal position, behind the rear edge of that part of the lower end of the plate which projects through the slot in the bar 31. Plate 20, after it has been displaced forwardly, and its downward movement has begun, can not move rearward until the plate has completed its downward movement and has nearly reached the end of its upward movement. In its downward move-

ment, the plate will lift the prong of the lever out of the hole in the controller, before the end of that hole engages the prong. While the prong is upheld, the imperforate part of the controller will pass beneath the prong. While the plate is moving up the pronged end of the lever will be lowered, and the prong thereon will come into contact with the controller at about the time the rearward extension of the plate moves above bar 31. During the further upward movement of the plate, the lever arm 27 will react on the plate and move it rearward to its normal position as shown.

It will be understood that mechanism like that which has been described is associated with each lever to be operated, as for example, the levers 14 of the type motor. The various plates 20 are arranged side by side, each lying in and being guided by slots in the front edges of the two bars 30, 31. There are of course as many springs 50 as there are plates 20, and these may all be attached to the same fixed bar 51. There are likewise as many springs 40 as there are levers 26 and these may be all attached to the fixed bar 41.

The various levers 26 are held in operative position with respect to the controller supporting device and the associated plate 20 and are guided in their movements by the guideways furnished by the vertical slots in the lower edge of fixed bar 36.

In order to facilitate the putting of a controller strip into operative position upon the shield 15, it is desirable that all of the prongs 26 be simultaneously raised. To accomplish this result a rock shaft 60^a is provided in the machine, and it carries a downwardly extended blade 61^a whose lower edge lies above and close to the rearwardly projecting arms 28 of all the levers 26. By rocking this rock shaft this blade will engage all of these rear lever arms and lift all of the prongs 26^a above and clear of the controller strip C.

Having described my invention, I claim:

1. In mechanism of the character described, the combination of a vertical plate, guiding means therefor permitting vertical movements and movements forward and backward, a pivoted lever having a prong at its end, a controller supporting device having a recess below said prong, connections between the plate and lever such that the downward movement of the prong end of the lever will displace the plate forward, and that the downward movement of the plate will lift the pronged end of the lever, and means to move the plate downward when it has been displaced forwardly.

2. In mechanism of the character specified, a vertical plate, guide means therefor permitting the plate to move up and down and forward and backward, a pivoted lever having a downwardly extended prong at its front end, a controller supporting device having a recess below said prong, said lever and plate having an operative engagement comprising an inclined guideway on one of said parts and a portion rigidly connected with the other part operating in said guideway.

3. In mechanism of the character specified, a vertical plate, guide means therefor permitting the plate to move up and down and forward and backward, a pivoted lever having a downwardly extended prong at its front end, a controller supporting device having a recess below said prong, said plate having an upwardly extended and rearwardly inclined slot, and said lever having an upwardly extended arm which projects into said slot and has an operative engagement therewith.

4. In mechanism of the character described, the combination of a plate, a guide bar having a slot into which the plate projects,—said plate having a part of its rear edge extended behind the rear end of said slot when said plate is in its normal position, and having a forwardly extended finger, a vertically reciprocating depressor bar which normally clears said finger but will engage therewith when the plate is forwardly displaced, a lever having a downwardly extended prong, a controller device having a recess below said prong,—the lever and plate having an operative engagement comprising an inclined guideway on one of said parts, and a member rigid with the other part engaging in said guideway.

5. In mechanism of the character described, the combination of a vertical plate, guide means therefor permitting the plate to move vertically and forward and backward, a spring acting to lift said plate,—said plate having a forwardly projecting finger and an inclined slot which extends upward and rearwardly from its lower edge, a reciprocating depressor bar which normally clears said finger as it moves up and down, a lever having at its forward end a downwardly extended prong and provided with an upwardly extended arm which extends into and has an operative engagement with the inclined slot in said plate, a spring acting on said lever to swing its prong carrying end downward when such movement is permissible, a controller supporting device having a recess below said prong.

6. In mechanism of the character described, the combination of a vertical plate, guide means therefor permitting the plate to move vertically and forward and backward, a spring acting to lift said plate, said plate having a forwardly projecting finger and an inclined slot which extends upward and rearwardly from its lower edge, a reciprocating depressor bar which normally

clears said finger as it moves up and down, a lever having at its forward end a downwardly extended prong and provided with an upwardly extended arm which extends into and has an operative engagement with the inclined slot in said plate, said lever having in its lower edge a rearwardly and upwardly inclined slot, a fixed bar in said slot upon which the lever is thereby pivoted and suspended, a spring acting against the rear end of said lever to push it forward and rock it upon said fixed bar in the direction to carry its pronged end downward, and a controller supporting device having a recess below the pronged end of said lever.

In testimony whereof, I hereunto affix my signature.

JOHN H. PILLINGS.