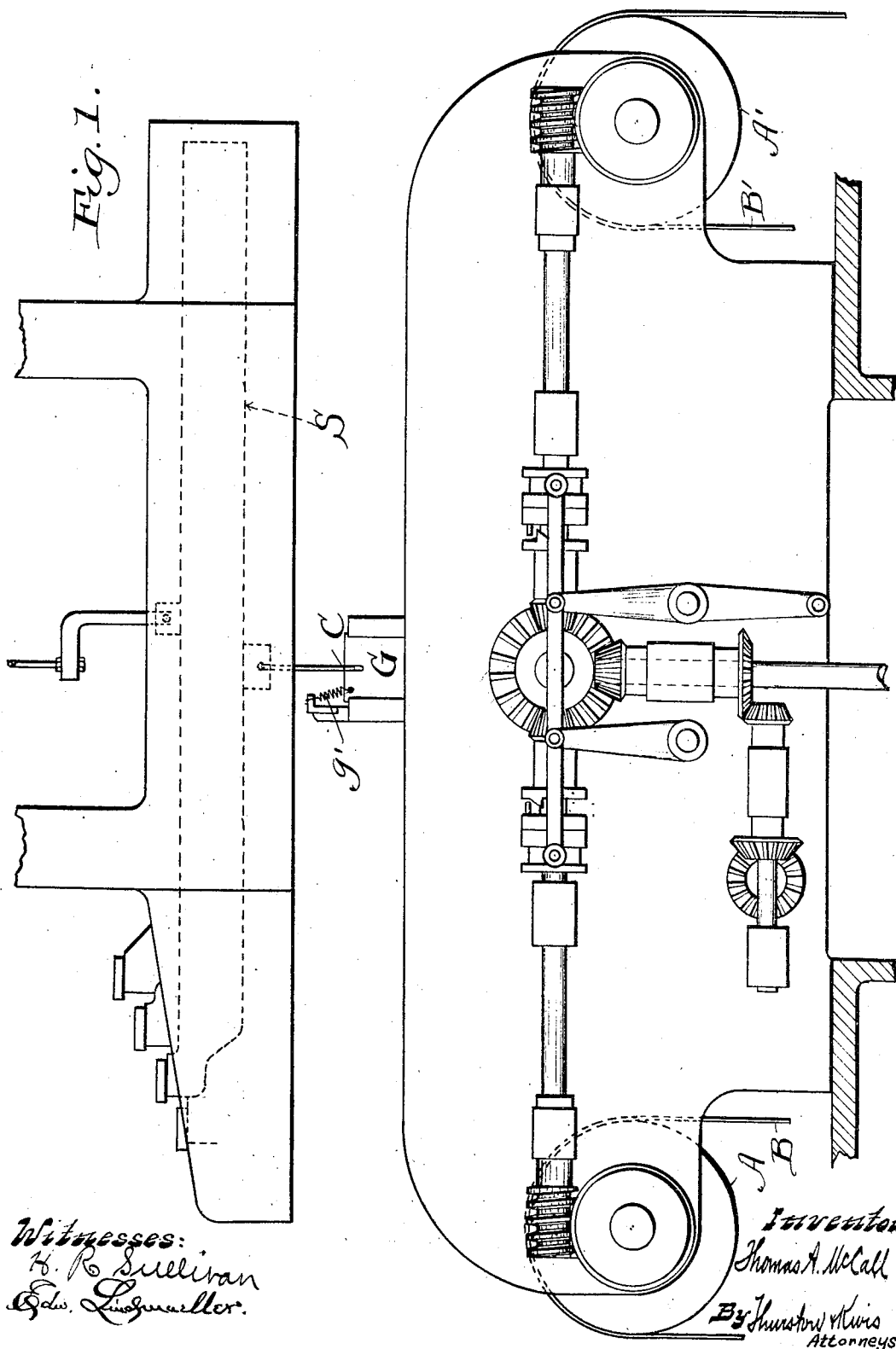


T. A. McCALL.
 MECHANISM FOR AUTOMATICALLY OPERATING LEVERS.
 APPLICATION FILED JULY 22, 1911.

1,024,092.

Patented Apr. 23, 1912.

5 SHEETS—SHEET 1.



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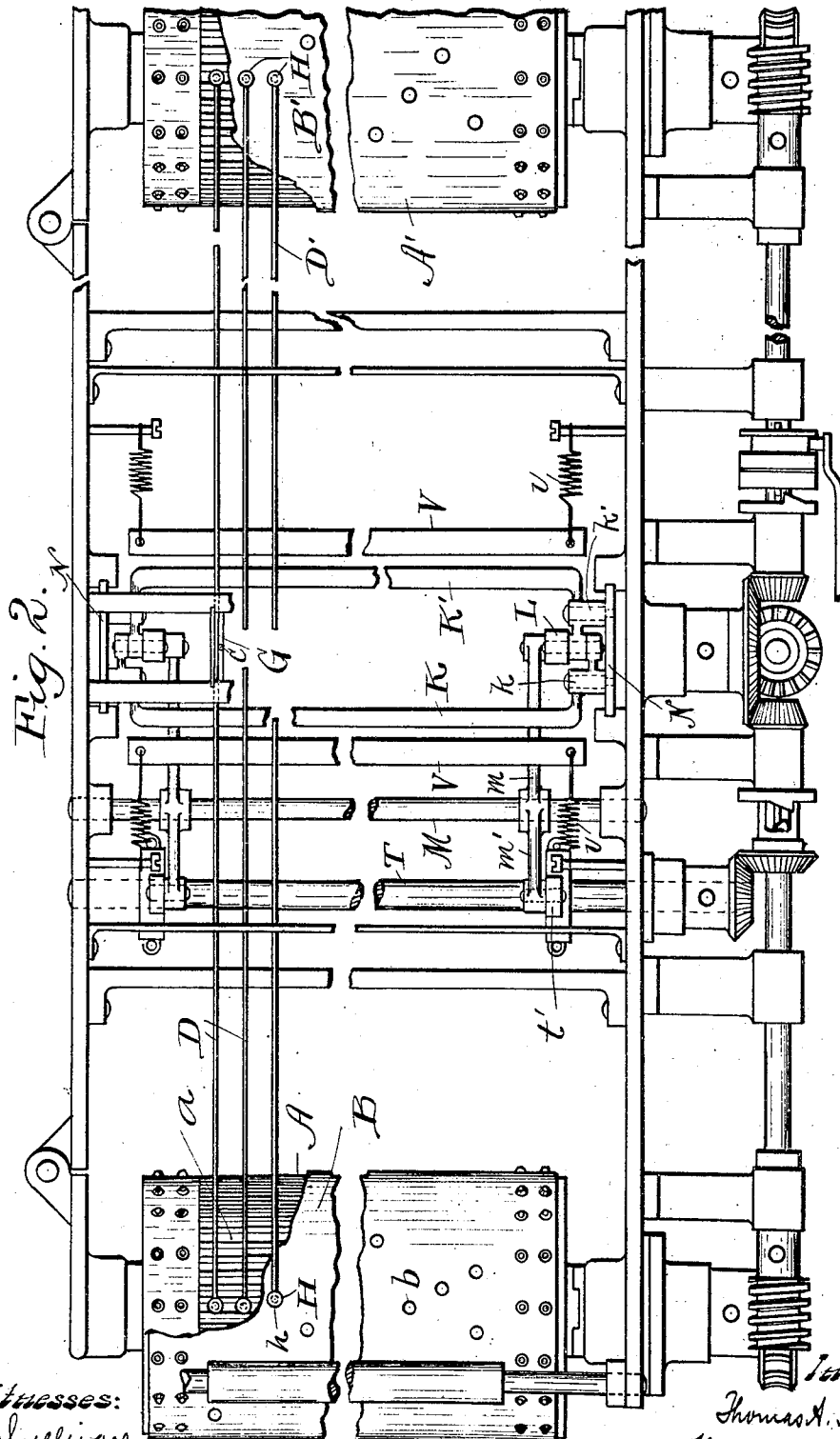


Fig. 2.

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5 SHEETS—SHEET 3.

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5 SHEETS—SHEET 4.

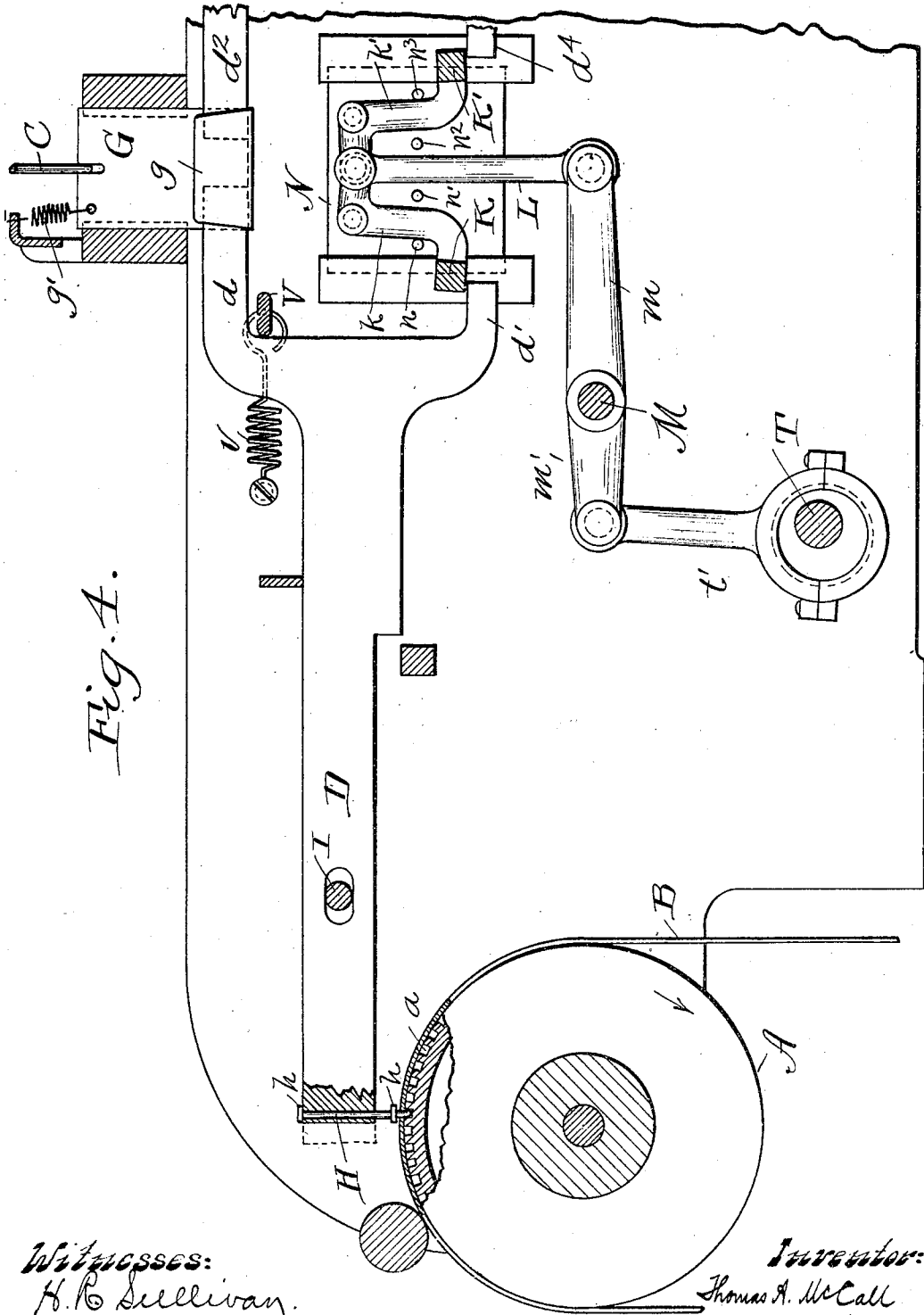


Fig. 4.

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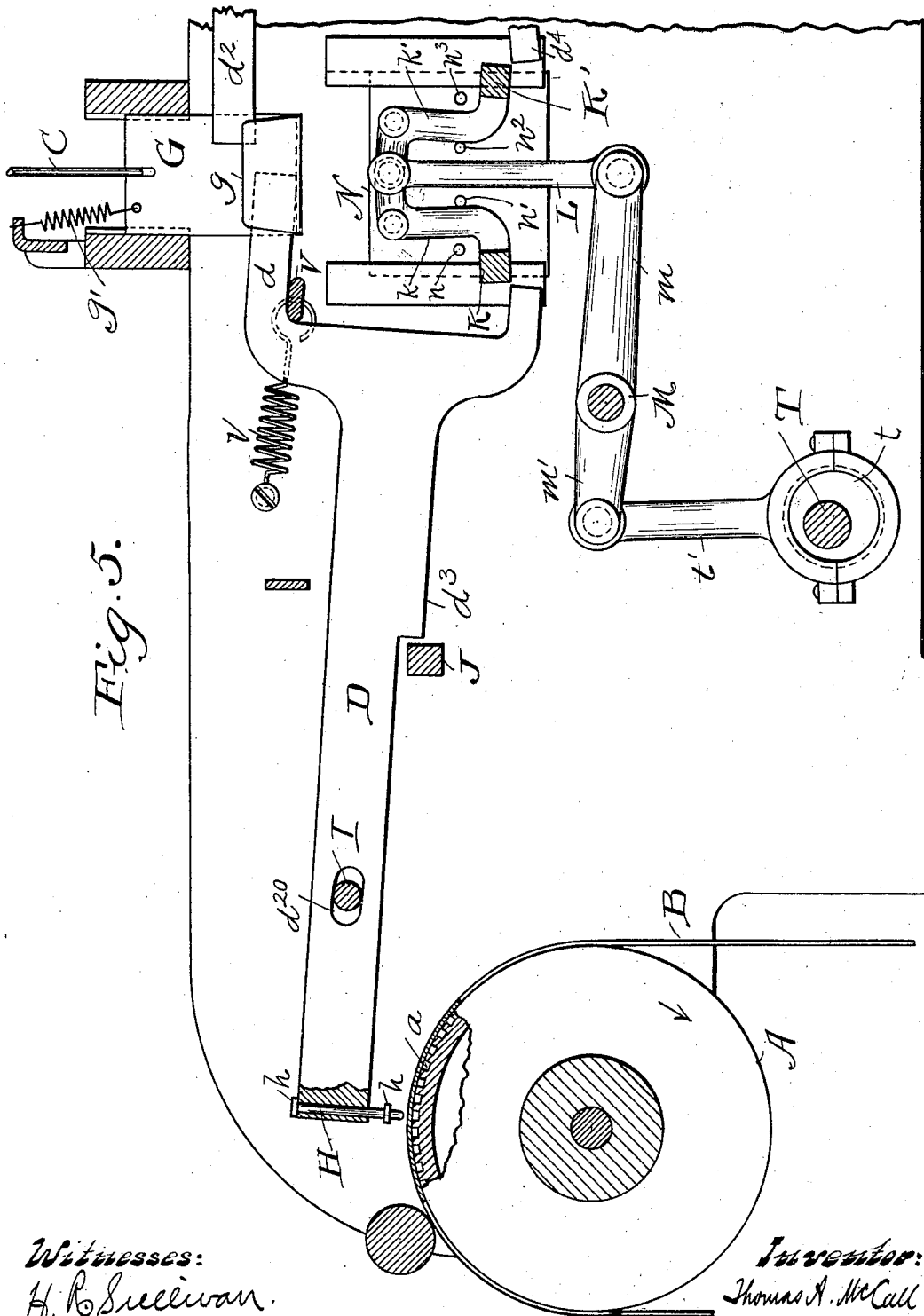


Fig. 5.

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UNITED STATES PATENT OFFICE.

THOMAS A. McCALL, OF CINCINNATI, OHIO.

MECHANISM FOR AUTOMATICALLY OPERATING LEVERS.

1,024,092.

Specification of Letters Patent.

Patented Apr. 23, 1912.

Application filed July 22, 1911. Serial No. 639,997.

To all whom it may concern:

Be it known that I, THOMAS A. McCALL, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented a certain new and useful Improvement in Mechanism for Automatically Operating Levers, of which the following is a full, clear, and exact description.

10 This invention relates to certain novel mechanism by means of which a plurality of movable parts, such as levers, may be operated in proper sequence as determined by either of two perforated controller strips.

15 The invention in the form shown is designed with special reference for its use for automatically operating the key levers and other parts of a typewriting machine; and it is shown in Figure 1 associated with a base of such a typewriting machine and connected with the levers thereof. There are, however, numerous other mechanisms, such as the keys of musical instruments, which could quite as well be operated by the means which constitute this invention.

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

30 In the drawing, Fig. 1 is an end view of a machine embodying this invention. This view shows very few of the new parts, but it does show in what relative position a typewriting machine should be placed in order that the slides G of this invention may be connected with and operate the key levers and other parts of a typewriting machine. Fig. 2 is a plan view which shows some of the sets of mechanisms which embody the invention. Fig. 3 is a sectional side view showing one set of such mechanisms and a part of its duplicate set, in what may be regarded as their normal positions. Fig. 4 is a similar view showing the position of the parts when in readiness to draw down a slide G. Fig. 5 is a similar view showing the position of the parts after slide G has been drawn down and the parts are about to return to their normal position.

50 Referring to the parts by letters, A represents a rotatable cylinder; and B represents a perforated controller strip which runs over this cylinder and is drawn along as the cylinder rotates. Associated with this cylinder are a plurality of levers D ar-

ranged in parallel relation, one of such levers being provided for each key lever or other part of a typewriting machine, or other mechanism which is to be operated. Each lever D has two tail pieces d, d' . The latter is for engagement with the depressor bar K, and the former extends into a stirrup g formed by turning up the lower end of a vertically movable slide G. Each slide G is under the influence of a spring g' tending to move it upward, and each slide is connected by means of a link C with a typewriter key lever S or some other mechanism which it is desired to operate.

70 The levers D are all pivoted upon a transversely extended rod I which passes through a longitudinal slot d^{20} in each lever. At what may be regarded as the front end of each lever is a vertical hole, in which is a freely movable vertical pin H having shoulders h, h , both above and below the lever to limit its movement. The lower end of each pin normally rests upon the unperforated part of the controller strip B; but when a perforation in such strip comes beneath one of these pins the pin will drop through the perforation. A large number of longitudinally extended grooves a are formed in the surface of this cylinder. When a pin H drops through a perforation in the controller strip it enters one of these grooves. The cylinder is constantly turning in the direction indicated by the arrow on Fig. 1, wherefore the lever whose pin is in one of these slots will be moved endwise toward the middle of the machine, thereby carrying the tail piece d' on said lever in such position that it will be struck by a reciprocating depressor bar K when the latter is moving downward. Each of the levers D has a downwardly widened portion d^3 behind its pivot which normally rests upon a fixed supporting bar J. When a lever D is moved rearward this thickened portion is moved off of the supporting bar, wherefore the rear end of the lever may be rocked downward.

85 The depressor bar K is fixed to the lower ends of two bell crank levers k , which are respectively pivoted to two vertically movable slides N mounted in suitable guideways on the side frame members of the machine. The upper horizontal arm of each of these bell cranks is pivotally connected with a link L, the lower ends of which links are pivotally connected with two nearly horizon-

tal arms m fixed to a rock shaft M. The vertical arms of the two bell crank levers k lie between two pins n, n' , by which the rocking movement of said bell crank levers is limited.

5 The rock shaft M is constantly rocking while the machine is in operation and may be rocked by the means shown, namely, two eccentrics t fixed to a rotating shaft T, and
10 each having an eccentric strap t' to which an arm m' is pivotally connected, said arms m' being fixed to the rock shaft M. When, by the rocking of the rock shaft M, the links L pull downward on the two levers k , they
15 are rocked until they engage with the pins n after which the slide N is moved downward. The tail pieces d' of the levers D, when the latter are in their normal positions, do not project into the path of the depressor
20 bar K when the same is moving downward, but, when one of said levers has been moved rearward by the dropping of its pin through a perforation in the controller strip into a
25 groove in the cylinder, said tail piece d' is moved into the path of this depressor bar, wherefore as the depressor bar comes down it will engage with and rock this lever. This will cause the tail piece d of said lever to draw downward the associated slide G,
30 which, as before stated, is connected with a typewriter lever or some other part which it is desired to operate. A return bar V extends crosswise of the machine and engages with the rear ends of all of the levers D
35 above their pivots, it being held in such engagement by springs v . The tension on these springs is increased when one of the levers is displaced, as stated, but as soon as it has been moved downward by a depressor
40 bar and has been released from said bar, this return bar V actuated by its springs v will return the displaced bar to its normal position.

There is in the machine, as shown, a second
45 rotatable cylinder A' which is a duplicate of the cylinder A. Over this runs a perforated controller strip B'. There is also a set of levers D' which are exactly like levers D and occupy the same relation to cylinder A' as
50 the levers D do to the cylinder A. The levers D' have tail pieces d^2, d^4 and one of these tail pieces d^2 extends into a stirrup into which also extends one of the tail pieces d of the levers D. Each slide G may therefore
55 be operated through the displacement of a lever D or D' as the case may be. Associated with the levers D' is a depressor bar K' fixed to the lower end of two bell crank levers k' which are pivoted to the same slides
60 N to which the bell crank levers k are pivoted. The vertical arms of these bell crank levers k' lie between pins n^2, n^3 , by which their rocking movement is limited. The horizontal arms of these two levers k' are
65 pivotally connected with the same links L

which have previously been described as connected with the levers k , the pivots between links L and levers k and k' being large enough to permit the levers to rock as stated.

When the rock shaft M rocks so as to push
70 the links L upward, both sets of levers k, k' will be rocked so as to draw the depressor bars K, K' toward one another, and thereby release whichever bar D or D' had been depressed during the downward movement of
75 said depressor bars. When these levers k, k' have been swung toward each other until they engage the stops n', n^2 , then the slides N are pushed upward. When the rock shaft rocks in the contrary direction, both levers
80 k, k' are rocked in the contrary direction as far as they are permitted to go, after which the slide N is moved downward. During this downward movement any lever D or D' which has been moved endwise by the en-
85 gagement of a pin H with a cylinder will be engaged by the bar K, or K', as the case may be, and rocked as before described.

It is not intended that both cylinders A and A' shall be operated at the same time.
90 In fact, Fig. 1 of the drawing shows mechanism by which either may be operated at will. This mechanism, however, is old, and is not a part of the present invention, and is shown and described in my Patent No.
95 1,000,741, granted August 15, 1911. Therefore, it needs no description here. There is one distinct advantage in having two cylinders, namely, that one of them and its associated perforated controller strip may cause
100 and control the operation of a typewriter so as to print circular letters while the other cylinder and its associated controller strip may cause and control the operation of a typewriter so as to print independent ad-
105 dresses on the several letters. If it is the cylinder A which is in operation the slides G will be operated by the levers D. If the cylinder A' is in operation the same slides G will be operated by the levers G'.
110

Having described my invention, I claim:

1. In mechanism for automatically operating levers and other movable parts, the combination of a rotatable cylinder having
115 a plurality of longitudinal grooves, a perforated controller strip which runs over said cylinder, a plurality of levers each carrying a pin adapted to rest upon said controller strip and to drop through holes therein into a groove on said cylinder whereby the lever
120 will be displaced endwise, and mechanism adapted to engage the lever which is so displaced and rock it.

2. In mechanism for automatically operating levers and other movable parts, the combination of a rotatable cylinder having
125 a plurality of longitudinal grooves, a perforated controller strip which runs over said cylinder, a plurality of levers each carrying a pin adapted to rest upon said controller
130

strip and to drop through holes therein into a groove on said cylinder whereby the lever will be displaced endwise, mechanism adapted to engage the lever which is so displaced and rock it, and a slide associated with each lever and adapted to be moved thereby when the lever is rocked.

3. In mechanism for automatically operating levers and other movable parts, the combination of a rotatable cylinder having a plurality of longitudinal grooves, a perforated controller strip which runs over said cylinder, a plurality of levers each carrying a pin adapted to rest upon said controller strip and to drop through holes therein into a groove on said cylinder, whereby the lever will be displaced endwise, mechanism adapted to engage the lever which is so moved endwise and rock it, and means for returning the displaced lever to its normal position.

4. In mechanism for automatically operating levers and other movable parts, the combination of a rotatable cylinder having a plurality of longitudinal grooves, a perforated controller strip which runs over said cylinder, a plurality of levers each carrying a pin adapted to rest upon said controller strip and to drop through holes therein into a groove on said cylinder whereby the lever will be displaced, and a reciprocating depressor bar located behind all of said levers and adapted to engage a part of any lever which is displaced and to rock said lever.

5. In mechanism for automatically operating levers and other movable parts, the combination of a rotatable cylinder having a plurality of longitudinal grooves, a perforated controller strip which runs over said cylinder, a plurality of levers each carrying a pin adapted to rest upon said controller strip and to drop through holes therein into a groove on said cylinder whereby the lever will be displaced endwise, a depressor bar which lies behind all of the levers, two bell crank levers, to the lower end of which said depressor bar is fixed, two slides to which said bell crank levers are pivoted, means limiting the rocking movement of said bell cranks about their pivots, and means engaging the horizontal arms of said bell crank levers whereby they may be pushed up and down.

6. In mechanism for automatically operating levers and other movable parts, the combination of a rotatable cylinder having a plurality of longitudinal grooves, a perforated controller strip which runs over said cylinder, a plurality of levers each carrying a pin adapted to rest upon said controller strip and to drop through holes therein into a groove on said cylinder whereby the lever will be displaced endwise, a depressor bar

which lies behind all of the levers, two bell crank levers, to the lower end of which said depressor bar is fixed, two slides to which said bell crank levers are pivoted, means limiting the rocking movement of said bell cranks about their pivots, a rock shaft having arms, and links connecting said arms with the horizontal arms of said bell crank levers.

7. In mechanism for automatically operating levers and other movable parts, the combination of a rotatable cylinder having a plurality of longitudinal grooves, a perforated controller strip which runs over said cylinder, a plurality of levers lying side by side and projecting over said cylinder, each having in its end a pin which is freely movable vertically and which normally rests upon the surface of said perforated strip, and mechanism for rocking any lever which is displaced endwise by the cylinder when one of said pins drops through a hole in the perforated strip into a groove in the cylinder.

8. In mechanism for automatically operating levers and other movable parts, the combination of two rotatable cylinders adapted for consecutive rotation and each having a plurality of longitudinal grooves, a perforated controller strip running over each cylinder, two sets of levers associated respectively with the two cylinders, each lever having a pin which normally rests upon the associated perforated strip and is adapted to drop through a hole therein into a groove in the associated cylinder, means for rocking any lever in either set which may be displaced, and a plurality of vertically movable slides each of which is operatively connected with two levers, one in each set.

9. In mechanism for automatically operating levers and other movable parts, the combination of two rotatable cylinders adapted for consecutive rotation and each having a plurality of longitudinal grooves, a perforated controller strip running over each cylinder, two sets of levers associated respectively with the two cylinders, each lever having a pin which normally rests upon the associated perforated strip and is adapted to drop through a hole therein into a groove in the associated cylinder, means for rocking any lever in either set which may be displaced, and a plurality of vertically movable slides each having a stirrup at its lower end into which a part of the lever of each set projects.

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

THOMAS A. McCALL.

Witnesses:

C. B. FERGUSON,
LOUIS J. HOPPE.