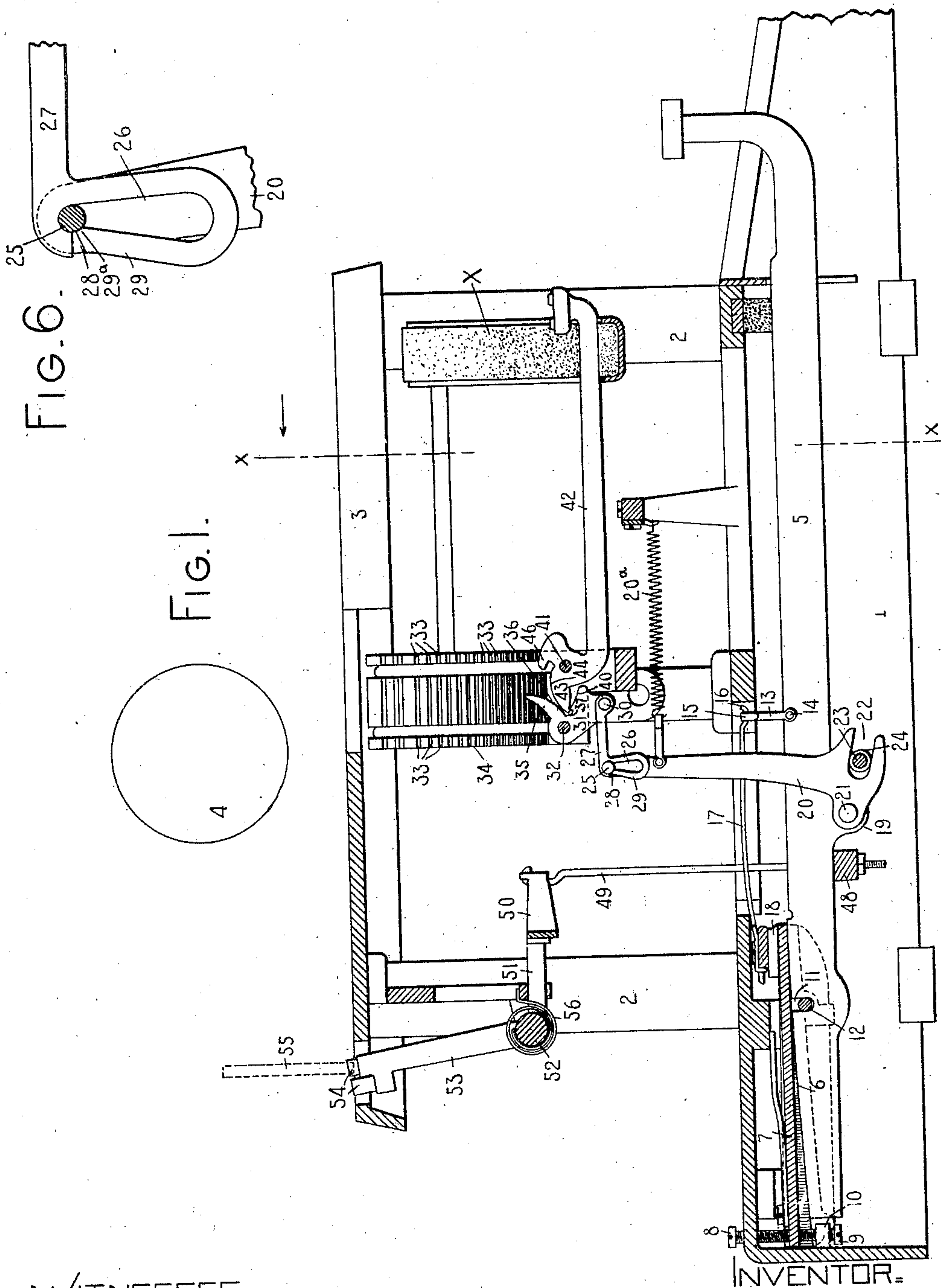


H. E. CURTIS.
TYPE WRITING MACHINE.
APPLICATION FILED OCT. 3, 1903.

Patented Aug. 2, 1910.

3 SHEETS—SHEET 1.

966,170.



WITNESSES.

K. V. Klonovans.
Charles Smith

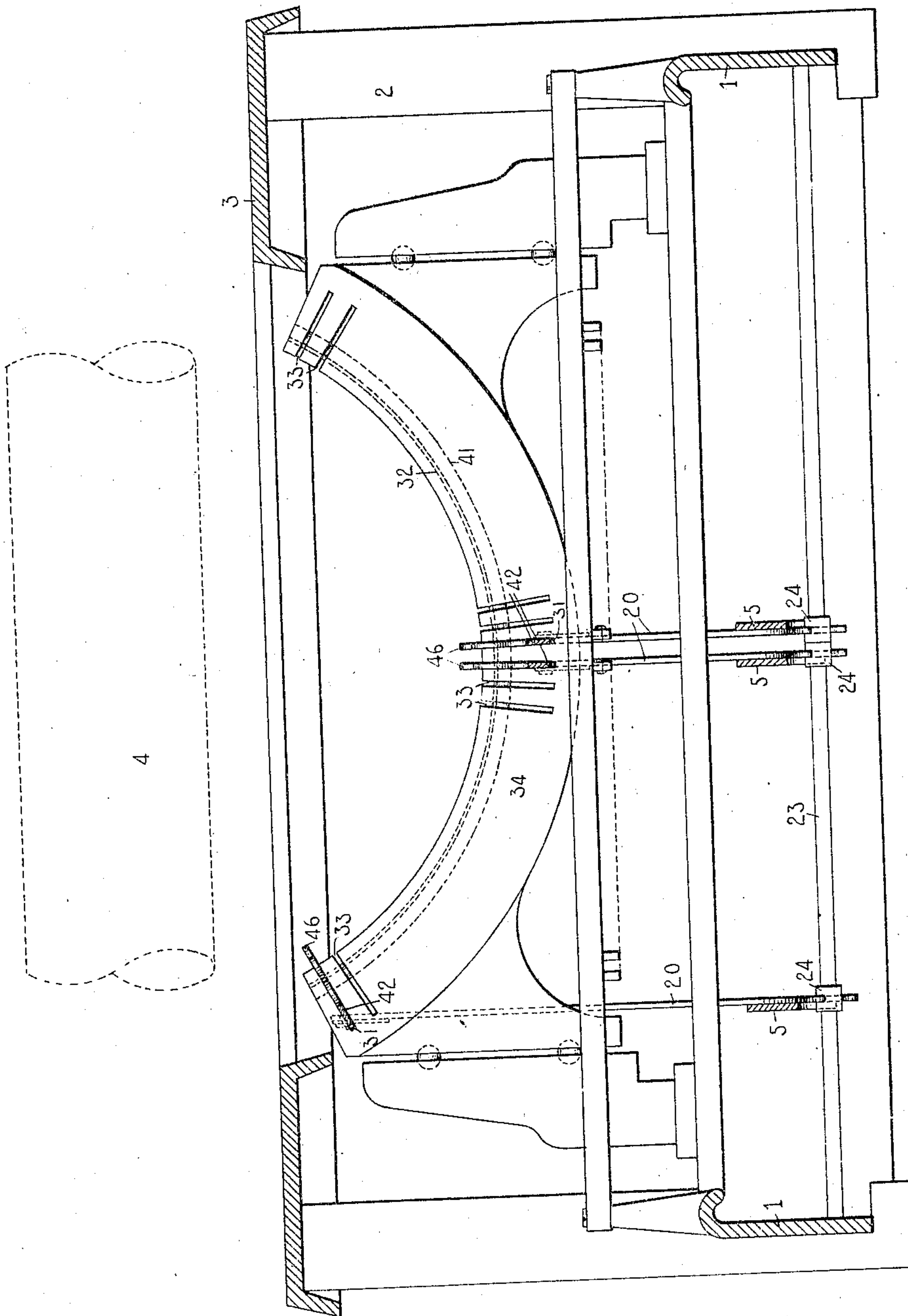
Henry E. Curtis
by Jacob F. Felbel
HIS ATTORNEY

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FIG. 2.



WITNESSES:

K. V. Donovan.

Charles Smith

INVENTOR:

Henry E. Curtis

by Jacob Felbel

HIS ATTORNEY

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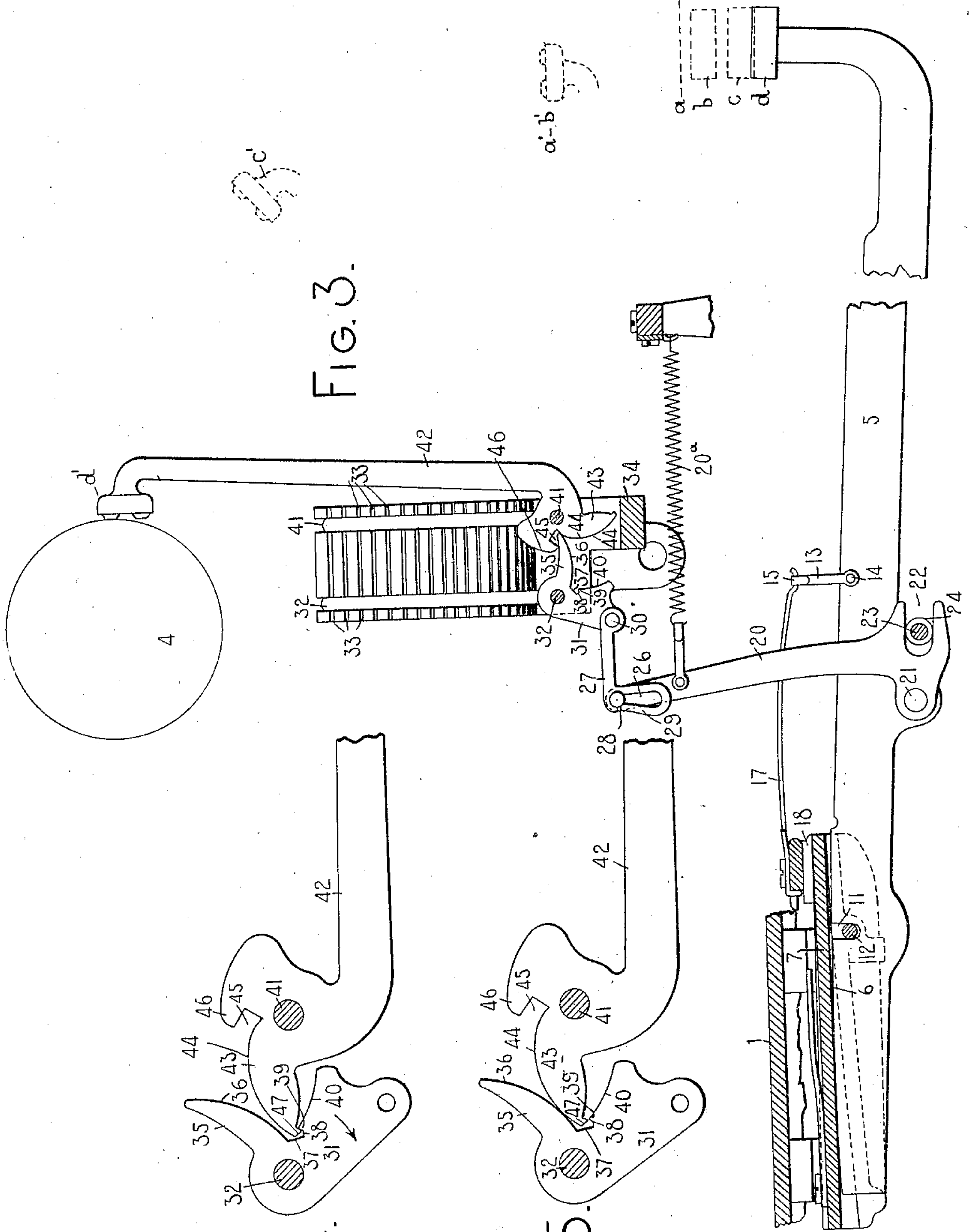


FIG. 3.

FIG. 4.

FIG. 5.

WITNESSES=

K. V. Monoran.

Charles Smith

INVENTOR=

Henry E. Curtis

by Jacob Felbel

HIS ATTORNEY

UNITED STATES PATENT OFFICE.

HENRY E. CURTIS, OF SYRACUSE, NEW YORK, ASSIGNOR TO THE MONARCH TYPE-
WRITER COMPANY, OF SYRACUSE, NEW YORK, A CORPORATION OF NEW YORK.

TYPE-WRITING MACHINE.

966,170.

Specification of Letters Patent.

Patented Aug. 2, 1910.

Application filed October 3, 1903. Serial No. 175,577.

To all whom it may concern:

Be it known that I, HENRY E. CURTIS, citizen of the United States, and resident of Syracuse, in the county of Onondaga and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My invention relates to typewriting machines and more particularly to the type actions thereof.

One of the objects of my invention is to provide a rapid, easy acting and efficient type action.

A further object of my invention is to provide a type action in which the actuating means therefor are so combined that the type bars are prevented from rebounding from the basket when they are moved back to their normal positions.

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

In the accompanying drawings, in which like reference characters indicate like parts in the various views, Figure 1 is a front to rear vertical sectional view of sufficient number of parts of a typewriting machine to illustrate my invention in its application thereto. Fig. 2 is a transverse sectional view of the same taken on the line $x-x$ of Fig. 1 and looking in the direction of the arrow at said line. Fig. 3 is a detail skeleton view in side elevation, showing one of the type actions and the positions the parts assume when the type bar is at the printing point. Fig. 4 is an enlarged detail fragmentary side elevation of one of the type bars and its cooperating actuating device; the view illustrating the disposition of the parts in their normal positions. Fig. 5 is a like view of the same showing the disengagement of the locking means effected at the initial portion of the key depression. Fig. 6 is a fragmentary detail side elevation showing the manner of connecting an actuating link to its key-lever.

The frame 1 of the machine is provided with corner posts 2 and a top plate 3 which is surmounted by a carriage (not shown) that supports a platen 4 diagrammatically

illustrated. Key levers 5 are curved at the upper rear edges thereof, as indicated at 6, to form bearing surfaces that cooperate with a fulcrum plate 7 mounted within the base of the machine and adapted to receive a vertical adjustment at the rear end thereof by means of set screws 8 and 9, the former passing through a threaded opening in the base of the machine and the latter through a threaded opening in a stud 10 which projects inwardly from the rear wall of the base of the machine. These set screws pass in opposite directions and constitute supports for the rear end of the fulcrum plate. It will be understood that an adjustment of the fulcrum plate varies the initial point of contact between the key levers and plate and thus changes the leverage of the key levers. The various key levers are recessed at 11 for the reception of a rod 12 that extends from side to side of the machine through the various recesses in the key levers so as to prevent them from moving longitudinally on the fulcrum plate. Each key lever has a link 13 pivoted thereto at 14 and provided with a hook-like end 15 adapted to engage a cooperating hook-like end 16 on a restoring spring 17 which is secured at its opposite end in any suitable manner to a fixed support 18 that extends from side to side of the machine. Each key lever has a depending portion 19 to which a sub-lever 20 is pivoted at 21 and the lower portion of each sub-lever is slotted at 22 for the reception of a fixed fulcrum rod or bar 23 which extends from side to side of the machine beneath the key levers and is provided with a series of surrounding loosely disposed sleeves 24, each of which cooperates with the slotted portion of the associated sub-lever. Each sub-lever is connected to one end of a contractile restoring spring 20^a, the opposite end of which is connected to a suitable fixed portion of the machine. From an examination of Fig. 2, it will be seen that the sub-levers gradually increase in length from the center to the sides of the segment so that the upper ends of said sub-levers are segmentally arranged where they cooperate with the actuating devices for the type bars. The upper end of each sub-lever is provided with a headed pin 25 and the stem of each pin is adapted to be received within a slot 26 that extends at

right angles or substantially right angles to the length of the type bar actuating device or link 27. This slot constitutes a pivot bearing which is larger in diameter at the lower portion thereof than at the upper portion, and one of the side walls of the slot is split, as indicated at 28, to form an integral spring 29 of one of the side walls of the slot 26. The tension of the spring portion or member 29 tends to force the upper free end 29^a thereof toward the opposite wall of the slot 26 and the distance between the upper inner face of the free end 29^a of the spring member and the opposite wall of the slot is slightly less than the largest diameter of the stem of the headed pivot 28 so that when the parts are in the normal position represented in Fig. 6, the pivot will be retained in the upper end of the slot 26 by the spring portion or member 29. In order to connect the link 27 to its associated actuating device or sub-lever 20, it is merely necessary to insert the pivot in that portion of the slot 26 which has the largest diameter and to move the pivot along the slot 26 and against the tension of the spring member 29 until the pivot is seated within that portion of the slot which is above the free end of the spring member 29. This movement of the pivot will deflect the member 29 back against its tension and the spring will bring the free end thereof to a point beneath the largest diameter of the pivot after it is seated in the upper portion of the slot, thereby retaining the pivot against accidental displacement or longitudinal movement in the slot 26. Upward pressure, however, on the rear end of the link 27, or that portion thereof which contains the slot, is sufficient to deflect the spring member 29 to one side, thus affording a movement of the link to a position where the headed pivot may be disengaged therefrom. It will be seen that by this construction means are provided for readily effecting an engagement or disengagement between the link 27 and its cooperating actuating device or sub-lever 20.

The forward end of each link 27 is pivoted at 30 to a type bar actuating device or bell crank 31, which is pivoted on a segmental wire 32 within a slot 33 in a type bar segment 34. This actuating device or bell crank lever has a forwardly extending arm 35 provided with a smooth, curved contact face 36, at the base of which is a slot or recess 37. This slot 37 is undercut or recessed at 38 in order to provide an engaging or locking nose 39, for purposes which will hereinafter more clearly appear. Extending from the nose 39 is a curved face 40 to help in restoring the type bar to normal position as will hereinafter appear. A pivot wire 41 is received in the segment and constitutes a pivot for a series of segmentally arranged upwardly and rearwardly striking type bars

42. Each type bar has a rearwardly extending actuating arm 43 provided with a smooth, curved contact face 44, at the base of which is an aperture or recess 45 that forms an abutment or engaging member 46. Each type bar is pivoted to vibrate in the same slot 33 in which the associated actuating device is adapted to vibrate and so that each actuating device 31 and its associated type bar moves in the same plane. From an examination of Fig. 1, it will be seen that the arms 35 and 43 on the actuating device and type bar, respectively, project from their pivots in opposite directions and that the oppositely curved contact faces 36 and 44 cooperate with each other; that during the depression of a key lever the type bar is moved from the normal position shown in Fig. 1 to the printing position illustrated in Fig. 3, and that during this movement the contact face 36 will have a rolling action on the cooperating contact face 44 of the type bar; that the terminal portion of the arm 35 will, on the completion of the movement, be brought within the recess 45 of the type bar and to a point where the abutment 46 will contact with the arm 35, thereby tending to cause a quick rebound or return of the type bar from the printing position. The return of the type bar to normal position is further facilitated by the curved face 40. Thus the restoring spring 20 tends to turn the actuating device 31 on its pivot as the type bar is returning to its normal position, thereby exerting an upward pressure on the part carrying the curved face 40 before the type bar reaches the normal position and said curved face cooperates with the nose or terminal of the rearwardly extending arm 43 on the type bar and exerts a camming action thereon and thus assists in restoring the type bar to its normal position. The restoring tendency of the curved face 40 is exerted during the backward movement of the type bar and after the arm 35 has escaped from the nose or tooth 46, and the nose 47 is engaged by the curved face 40. The pressure of the restoring spring then becomes effective through said curved face 40 to exert a camming pressure on the arm 43 which tends to restore the type bar to its normal position. When the type bar and its actuating device reach the normal positions shown in Figs. 1 and 4, there is an interlocking between the type bar actuating device and the type bar. That is to say, when the parts are in the normal positions, there is likewise an interlocking engagement between the terminal portion of the arm 43 on the type bar and its actuating device, or in other words, that a locking nose 47 on the actuating arm 43 of the type bar will be seated within the locking recess and behind the locking nose or abutment 39 on the actuating device, and that this engage-

ment will prevent or limit the rebound of the type bar from the type basket or pad X against which the type bars normally rest. When, however, pressure is exerted upon a key lever, motion will be transmitted to the associated actuating device 31, through its sub-lever 20 and actuating link 27, to turn the actuating device around its pivot 32, in the direction of the arrow in Fig. 4. This movement of the actuating device is independent of the type bar and continues until the contact face 36 on the actuating device is brought into contact with the curved face 44 on the arm of the type bar, as indicated in Fig. 5, when the actuating device effects a movement of the type bar. This independent movement of the actuating device is effective to bring about a disengagement between the locking nose 39 thereon and its co-operating locking nose 47 on the type bar so as to automatically release the bar from its locking engagement before the movement of the actuating device is effective to transmit movement to the type bar.

From an examination of Fig. 5 it will be seen that after the lost motion between the actuating device and type bar is taken up and at the initial portion of a key depression, the arm 35 contacts with the actuating arm 43 on the type bar near the outer end of said arm 43 where the longest leverage is afforded and that as the type bar approaches the printing position, the contact face of the actuating device has a rolling movement on the arm 43 and gradually approaches the pivot of the type bar and gradually works upon a shorter leverage so as to effect an acceleration of the movement of the type bar as it approaches the printing position. On the return movement of the type bar the first portion of the movement is an accelerated one, thereby affording a rapid movement of the bar from the vicinity of the platen.

By my construction I have provided a type action wherein the type bar is not taken up at the first portion of each depression of the key lever, thereby affording but little resistance to the depression of the key at the initial portion of the stroke and after the type bar has been taken up, the movement thereof is gradually accelerated in its approach to the printing position by a gradual change of leverage between the actuating device 31 and the actuating arm on the type bar. There is likewise a variation in the key lever fulcrum during the depression of the key lever, a longer leverage being afforded to the key lever as the depression continues, as will be understood by a comparison of Figs. 1 and 3 of the drawings. The dotted line *a* in Fig. 3 represents the top of the key in the normal position thereof. At the initial portion of the key depression, or in the movement thereof

from the position indicated by the line *a* to the dotted line position represented at *b*, there is no movement whatever of the type bar as represented by the position *a'—b'*; the key lever at this time merely effecting a movement of the associated actuating device from the position illustrated in Fig. 4 to that indicated in Fig. 5 in order to effect a release of the type bar from its locking means. A further depression of the key lever to the position indicated in dotted lines at *c* is effective to produce a gradually accelerated movement of the type bar to the position indicated at *c'*, whereas a still further depression of the key lever from the position indicated at *c* to that represented in full lines at *d* is effective to move the type bar to the printing position shown at *d'*. It will therefore be seen that about two-thirds of the depression of a key lever, or that indicated from the dotted line *a* to the position *c*, is effective to move the type bar through about one-half of its printing stroke, whereas it requires about one-third the depression of a key lever, or that indicated by the movement from the position *c* to that represented at *d*, to move the type bar through the remaining path of its travel to the printing position. The means therefore afford but little resistance to the initial portion of the movement or depression of the key lever, which in effect is practically a lost motion, and when the type bar is taken up a gradually accelerated movement is produced up to the time the type bar impacts against the platen, thereby affording a slight, easy, rapid and efficient action wherein the type bar may quickly recede from the printing position and is automatically locked or limited against rebound from the type pad or basket when the type bar is in normal position. As soon as the type bar reaches its normal position, the spring 20^a is effective to move the actuating device to a position where the locking nose thereof will engage behind the locking nose 47 on the arm 43 of the type bar and rebound of the type bar is prevented.

It will be understood that any desired carriage escapement mechanism may be employed. In the present instance I have illustrated a universal bar 48 which extends beneath the various key levers and is connected at its ends to upwardly extending links 49 that are hung upon a transverse bar 50 which projects from an arm 51 carried by a rock shaft 52 of a dog rocker 53 that carries feed dogs 54 at the upper end thereof. Each of these feed dogs coöperates with a suitable feed or escapement rack 55, diagrammatically illustrated in Fig. 1, and which controls the movement of the carriage (not shown). A restoring spring 56 is connected at one end to the rock shaft and at its opposite end to a fixed portion of the ma-

chine to restore the dog rocker to its normal position.

Various changes may be made without departing from the spirit of my invention.

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

1. In a type action, the combination of a type bar that has an actuating arm with a curved contact face, a pivoted key operated actuating element with a curved contact face that coöperates with the curved contact face on the actuating arm of the type bar and has a rolling action thereon, means for automatically locking the type bar against rebound, and a lost motion connection between the actuating element and type bar to afford an automatic release of the type bar.

2. In a type action, the combination of a type bar that has an actuating arm with a curved contact face, a pivoted key operated actuating element with a curved contact face that coöperates with the curved contact face on the actuating arm of the type bar and has a rolling action thereon, and which works from the outer portion of the said arm toward the pivot of the type bar in the movement of the type bar to the printing position, so as to afford a gradually accelerated movement of the bar in its approach to the printing position, and interlocking means on the type bar and actuating element which automatically coöperate when said parts are in the normal positions and to lock the type bar against rebound.

3. In a type action, the combination of a type bar that has an actuating arm with a curved contact face, a key operated turning actuating element pivoted to a relatively fixed portion of the machine and provided with a curved contact face that coöperates with the different portions of the curved contact face on the actuating arm of the type bar and has a rolling action thereon, a sub-lever operatively connected to said actuating element, a key lever for controlling said sub-lever, and means for automatically locking the type bar against rebound when the parts are in the normal position.

4. In a type action, the combination of a type bar that has an actuating arm with a curved contact face, a pivoted key operated actuating element with a curved contact face that coöperates with the curved contact face on the actuating arm of the type bar and has a rolling action thereon, a link connected to said actuating element, a sub-lever connected to said link, and a key lever controlling said sub-lever.

5. In a type action, the combination of a type bar that has an actuating arm with a curved contact face, a key operated turning actuating element pivoted to a relatively fixed portion of the machine and provided with a curved contact face that coöperates

with the different portions of the curved contact face on the actuating arm of the type bar and has a rolling action thereon and which works from the outer portion of the said type bar arm toward the pivot of said bar in the movement of the type bar to the printing position, so as to afford a gradually accelerated movement of the bar in its approach to the printing position, a sub-lever operatively connected to said pivoted actuating element, a key lever for controlling said sub-lever, and means for automatically locking the type bar against rebound when the parts are in normal position.

6. In a type action, the combination of a type bar, a bell crank lever that is disconnected from the type bar but coöperates therewith to actuate it, an independent key lever for actuating said bell crank, intermediate coöperating curved contact faces on said bell crank and type bar, and automatically actuated locking means for preventing a rebound of the type bar.

7. In a type action, the combination of a type bar, a bell crank lever that is disconnected from the type bar but coöperates therewith to actuate it, intermediate coöperating curved contact faces on said bell crank and type bar, said bell crank and type bar each being provided with a recess at one end of said curved contact face, a key lever independent of but operatively connected to said bell crank lever, and locking means associated with said type bar and bell crank to prevent a rebound of the type bar.

8. In a type action, the combination of a type bar, a bell crank lever that is disconnected from the type bar but coöperates therewith to actuate it, intermediate coöperating curved contact faces on said bell crank and type bar, said bell crank and type bar each being provided with a recess at one end of said curved contact face, which recesses each receive the terminal of the contact face of the other member, a key lever independent of but operatively connected to said bell crank lever, and locking means associated with said type bar and bell crank to prevent a rebound of the type bar.

9. In a type action, the combination of a pivoted type bar, an actuating arm that projects therefrom, a pivoted actuating device having an arm that coöperates with the arm on the type bar and has a rolling contact thereon, said arms projecting in opposite directions and affording a gradually accelerated movement of the type bar as it approaches the printing position, a key lever independent of but operatively connected to said pivoted actuating device, and locking means associated with said actuating device and type bar to prevent a rebound of the type bar.

10. The combination of a type bar seg-

ment, a series of type bars pivoted in said segment and having actuating arms, a series of actuating devices that are pivoted in said segment and have arms that are disconnected from but contact with the arms on the type bars to actuate them and have lost motion connections with said arms, locking means, the automatic release of which is afforded by said lost motion connections, and key levers operatively connected to said actuating devices.

11. The combination of a type bar segment, a series of segmentally arranged type bars pivoted in said segment and having actuating arms, a series of segmentally arranged actuating devices that are pivoted in said segment, and have arms that are disconnected from but contact with the actuating arms on the type bars, a series of segmentally arranged links connected to said actuating devices, a series of upright sub-levers that are segmentally arranged at their upper ends where they are connected to said links, and a series of key levers connected to said sub-levers.

12. The combination of a type bar segment, a series of segmentally arranged upwardly and rearwardly striking type bars pivoted in said segment and having actuating arms, a series of segmentally arranged actuating devices that are pivoted in said segment and in the same planes as the type bars, and have arms that are disconnected from but contact with the actuating arms on the type bars, a series of segmentally arranged links connected to said actuating devices, a series of upright sub-levers that are of progressively greater length from the center to the sides of the segment so that they are segmentally arranged at their upper ends where they are connected to said links, and a series of key levers connected to said sub-levers.

13. The combination of a type bar segment, a series of type bars pivoted in said segment and having actuating arms, a series of actuating devices that are pivoted in said segment and have arms that are disconnected from but contact with the arms on the type bars to actuate them, the said arms on the type bars and actuating devices being curved on their contact faces and affording a lost motion between them, locking means to prevent the rebound of the type bar and the release of which is afforded through said lost motion, and key levers operatively connected to said actuating devices.

14. The combination of a type bar segment, a series of segmentally arranged type bars pivoted in said segment and having actuating arms, a series of segmentally arranged actuating devices that are pivoted in said segment, and have arms that are disconnected from but contact with the actuating arms on the type bars, the said arms on

the type bars and the actuating devices being curved on their contact faces, a series of segmentally arranged links connected to said actuating devices, a series of sub-levers that are segmentally arranged at the ends thereof which are connected to said links, and a series of key levers connected to said sub-levers.

15. The combination of a type bar segment, a series of segmentally arranged upwardly and rearwardly striking type bars pivoted in said segment and having actuating arms, a series of segmentally arranged actuating devices that are pivoted in said segment, and in the same planes as the type bars and which have arms that are disconnected from but contact with the actuating arms on the type bars, the said arms on the type bars and actuating devices being curved on their contact faces, a series of segmentally arranged links connected to said actuating devices, a series of sub-levers that are of progressively greater lengths from the center to the sides of the segment so that they are segmentally arranged at ends thereof which are connected to said links, and a series of key levers connected to said sub-levers.

16. The combination of a pivoted type bar having an actuating arm, a key lever, and an actuating device independent of but controlled by said key lever and which cooperates with and has a differential leverage on the arm on said type bar and locks the type bar against rebound.

17. The combination of a pivoted type bar having an actuating arm, a key lever, and a pivoted actuating device independent of but controlled by said key lever and which is disconnected from but cooperates with the arm on said type bar to lock the type bar against rebound.

18. The combination of a type bar having an actuating arm, and a key operated actuating device having a locking recess therein that is adapted to receive the actuating arm on the type bar and lock the type bar against rebound.

19. The combination of a type bar having an actuating arm, and a key operated pivoted actuating device that is disconnected from said arm on the type bar but cooperates therewith, said actuating device having a locking recess therein that is adapted to receive and interlock with the actuating arm on the type bar and lock the type bar against rebound when the said arm is seated in said recess.

20. In a type action, the combination of a pivoted type bar, an actuating arm that projects therefrom, a key lever, a pivoted actuating device independent of but controlled by said key lever and having an arm that cooperates with the arm on the type bar and has a rolling contact thereon, said arms pro-

jecting in opposite directions and affording an accelerated movement of the type bar as it approaches the printing position, and co-operating means formed on said arms for automatically preventing or limiting the rebound of the type bar.

21. In a type action, the combination of a pivoted type bar, an actuating arm that projects therefrom, and a pivoted actuating device having an arm that coöperates with the arm on the type bar and has a rolling contact thereon, said arms projecting in opposite directions and affording an accelerated movement of the type bar as it approaches the printing position, the actuating device being formed with a locking recess at the base of the arm thereon for coöperation and to afford an interlocking engagement with the free end of the arm on the type bar to lock the type bar against rebound.

22. In a type action, the combination of a pivoted type bar, an actuating arm that projects therefrom, and a pivoted actuating device having an arm that coöperates with the arm on the type bar and has a rolling contact thereon, said arms projecting in opposite directions and affording an accelerated movement of the type bar as it approaches the printing position, the type bar being formed with a recess at the base of the arm thereon for the reception of the free end of the arm on the actuating device, whereas the actuating device is formed with a locking recess at the base of the arm thereon for coöperation and to afford an interlocking engagement with the free end of the arm on the type bar to prevent or limit the rebound of the bar.

23. In a type action, the combination of a type bar, a key lever, and an independent actuating device controlled by said key lever and which is disconnected from said type bar but contacts therewith, said type bar and actuating device interlocking in the normal and printing positions; interlocking in the normal position to prevent or limit the rebound of the type bar and interlocking in the printing position to effect a rapid return of the type bar.

24. In a type action, the combination of a type bar, a key lever, a pivoted actuating device independent of but controlled by said key lever and having a curved contact face that coöperates with the type bar, a locking member formed on the actuating device adjacent to the pivot thereof, and a coöperating locking member formed on the type bar and automatically interlocking with the locking member on the actuating device to limit or prevent the rebound of the type bar.

25. In a type action, the combination of a type bar, a pivoted actuating device having a curved contact face that coöperates with the type bar, a locking member formed on the actuating device adjacent to the pivot

thereof, a coöperating locking member formed on the type bar and automatically engaging the locking member on the actuating device to limit or prevent the rebound of the type bar, a sub-lever operatively connected to said actuating device, and a key lever controlling the movement of said sub-lever.

26. In a type action, the combination of a type bar, and a key actuated bell crank lever that is disconnected from the type bar but coöperates therewith to actuate it, coöperating curved contact faces on said bell crank and type bar, said bell crank and type bar each being provided with a recess at one end of said curved contact face, each receiving the terminal of the contact face of the other member, a locking nose near the terminal of one contact face, and a coöperating locking recess in the other member for automatically locking the type bar against rebound when the parts are in their normal positions.

27. In a type action, the combination of a type bar, a key actuated bell crank lever that is disconnected from the type bar but coöperates therewith to actuate it, coöperating curved contact faces on said bell crank and type bar, said bell crank and type bar each being provided with a recess at one end of said curved contact face, which receives the terminal of the contact face of the other member, a locking nose near the terminal of one contact face, a coöperating locking recess in the other member for automatically locking the type bar against rebound when the parts are in their normal positions, and means for effecting a disengagement between said locking nose and recess at the initial portion of a key depression.

28. In a type action, the combination of a type bar, a bell crank lever having a curved contact face that coöperates with the type bar, a locking member formed on the bell crank lever adjacent to the pivot thereof, a coöperating locking member formed on the type bar and automatically engaging the locking member on the bell crank lever to limit or prevent the rebound of the type bar, a link connected to said bell crank lever, a sub-lever operatively connected to said link, and a key lever controlling the movement of said sub-lever.

29. A type bar actuating link having an apertured portion that extends at substantially right angles to the length thereof, said apertured portion being narrower at one portion thereof than at another and forming a pivot bearing at the narrow portion thereof, and a spring for preventing accidental displacement of the pivot from the narrow portion of the bearing and affording a movement of the pivot at right angles to the length of the link when it is desired to effect

a disconnection between the link and the pivot carrying member with which it is connected.

30. A type bar actuating device having an elongated inclosed slot therein which extends at right angles to the length of said device and forms a pivot bearing at one end thereof, and a spring to prevent an accidental displacement of a pivot from the bearing end of the slot.

31. A type bar actuating device having an elongated inclosed pivot receiving slot therein, one wall of said slot being split to form a spring to prevent an accidental displacement of the pivot from one end of the slot.

32. The combination of a type bar, a sub-lever for actuating the type bar, a key lever for actuating the sub-lever, an actuating device between the sub-lever and type bar, and spring pressed connecting means for maintaining the actuating device connected to one of said parts between which it is interposed, said spring pressed means comprising a pivot receiving slot in one of said members with a bearing in one end of said slot and a spring on the same member for preventing an accidental displacement of the pivot from the bearing end of the slot.

33. The combination of a type bar, actuating devices therefor, one of said actuating devices having a headed pivot pin extending therefrom and another of said actuating devices having an elongated opening that is wider at one portion thereof than at another and forms a bearing at one end, said opening affording a free passage of the head of the pivot pin through the wide portion thereof but not through the narrow portion, the parts being arranged so that the pivot is normally seated in the narrow bearing portion of the opening, and means for engaging said pivot and preventing accidental relative displacement of the parts.

34. The combination of a type bar, and actuating devices therefor, one of said actuating devices having a headed pivot pin extending therefrom and another of said actuating devices having an elongated opening that is wider at one portion thereof than at another and affords a free passage of the head of the pivot pin through the wide portion thereof but not through the narrow portion, the parts being arranged so that the pivot pin is normally seated in the narrow pivot bearing portion of the opening, and a spring carried by one of said devices to prevent the pivot pin from being accidentally displaced from the narrow portion of the opening.

35. In a type action, the combination of a type bar having a curved actuating contact face, a key operated actuating element pivoted to a fixed portion of the machine and provided with a contact face that coöperates with the curved contact face on the type bar

and has a rolling action thereon, a sub-lever operatively connected to said actuating element, and a key lever for controlling said sub-lever, certain of the parts recited being constructed and arranged so as to form a lock to lock the type bar against rebound when it is in the normal position.

36. In a type action, the combination of a type bar having a curved actuating contact face, an actuating element pivoted to a fixed portion of the machine and provided with a contact face that coöperates with different portions of the curved contact face on the type bar and has a rolling action thereon and which works from the outer portion of said contact face on the type bar toward the pivot thereof in the movement of the type bar to the printing position so as to obtain an accelerated movement of the bar in its approach to the printing position, a sub-lever operatively connected to said pivoted actuating element, and a key lever for controlling said sub-lever, certain of the parts recited being constructed and arranged so as to form a lock to lock the type bar against rebound when it is in the normal position.

37. In a type action, the combination of a type bar, an angular actuating lever that is disconnected from the type bar but coöperates therewith to actuate it, and an independent key-actuated lever for actuating said angular lever, the type bar having a curved contact face on which said angular lever has a rolling contact, and the construction and arrangement of the parts being such that the angular lever coöperates with the type bar to form a lock to lock the type bar against rebound when the parts are in normal position.

38. In a type action, the combination of a pivoted type bar having an actuating contact surface, a pivoted actuating device having an arm that coöperates with the actuating surface on the type bar and has a rolling contact thereon, affording an accelerated movement of the type bar as it approaches the printing position, and a key lever independent of but operatively connected to said pivoted actuating device, the construction and arrangement of said actuating device and the contact surface on the type bar with which it coöperates forming a lock to lock the type bar against rebound when the parts are in normal position.

39. The combination of a type bar segment, a type bar having a locking member, a key lever and an actuating device pivotally supported on said type bar segment and separate from but controlled by said key lever and having a locking member coöperative with the locking member on the type bar to lock the type bar against rebound when the parts are in normal position.

40. The combination of a type bar segment, a type bar having an actuating arm,

5 a key operated actuating device that is piv-
 otally supported on said type bar segment
 and is separate from said arm on the type
 bar but coöperates therewith, said actuating
 10 device having a locking recess therein that
 is adapted to receive and interlock with the
 actuating arm on the type bar and to lock
 the type bar against rebound when said arm
 is seated in said recess, and a key lever sepa-
 15 rate from but coöperative with said actuat-
 ing device.

41. In a type action, the combination of
 a pivoted type bar, an actuating arm that
 projects therefrom, a pivoted actuating de-
 15 vice having an arm that coöperates with the
 arm on the type bar and has a rolling con-
 tact thereon, said arms projecting in oppo-
 site directions and affording an accelerated
 movement of the type bar as it approaches
 20 the printing position, the actuating device
 being formed with a locking recess at the
 base of the arm thereon for coöperation and
 to afford an interlocking engagement with
 the free end of the arm on the type bar to
 25 lock the type bar against rebound, and a key
 lever separate from but coöperative with
 said actuating device to operate it.

42. In a type action, the combination of a
 pivoted type bar, an actuating arm that pro-
 30 jects therefrom, a pivoted actuating device
 having an arm that coöperates with the arm
 on the type bar and has a rolling contact

thereon, said arms projecting in opposite di-
 rections and affording an accelerated move-
 ment of the type bar as it approaches the 35
 printing position, the type bar being formed
 with a recess at the base of the arm thereon
 for the reception of the free end of the arm
 on the actuating device, whereas the actuat-
 ing device is formed with a locking recess 40
 at the base of the arm thereon for coöpera-
 tion and to afford an interlocking engage-
 ment with the free end of the arm on the
 type bar to prevent or limit the rebound of
 the bar, and a key lever separate from but 45
 coöperative with said actuating device to
 operate it.

43. In a type action, the combination of a
 type bar; a finger key; and intermediate
 connections between said finger key and type 50
 bar, said connections comprising a plurality
 of angular levers, and parts that have a
 rolling contact one on the other to afford an
 acceleration of the type bar in its movement
 to printing position and which coöperate to 55
 lock the type bar against rebound when the
 parts are in normal position.

Signed at Syracuse, in the county of
 Onondaga, and State of New York, this 1st
 day of October A. D. 1903.

HENRY E. CURTIS.

Witnesses:

CHAS. J. BOND,
 JOHN H. WALRATH.