

No. 677,706.

Patented July 2, 1901.

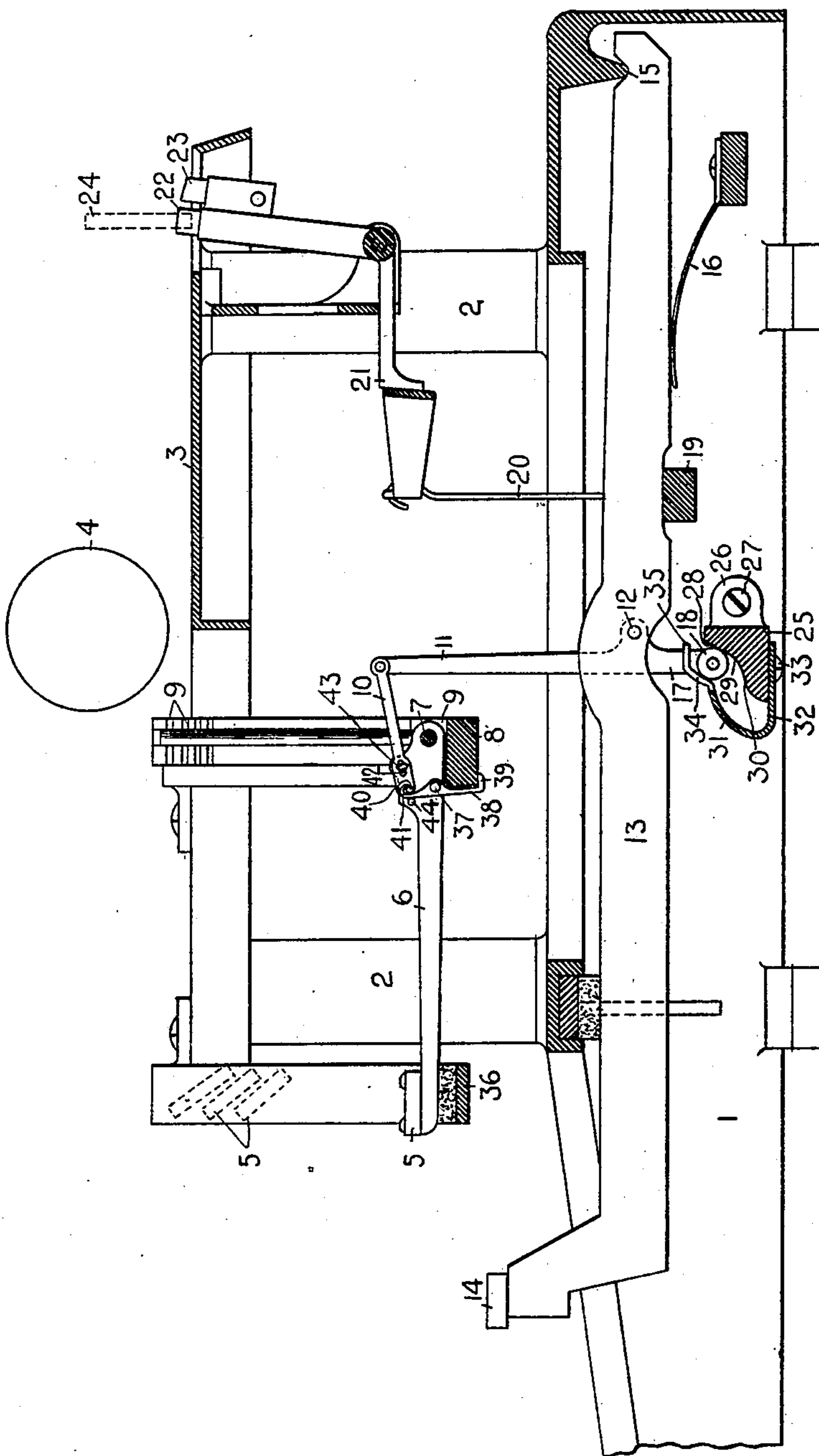
C. H. SHEPARD.
TYPE WRITING MACHINE.

(Application filed Mar. 18, 1901.)

(No Model.)

5 Sheets—Sheet 1.

FIG. 1.



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INVENTOR:

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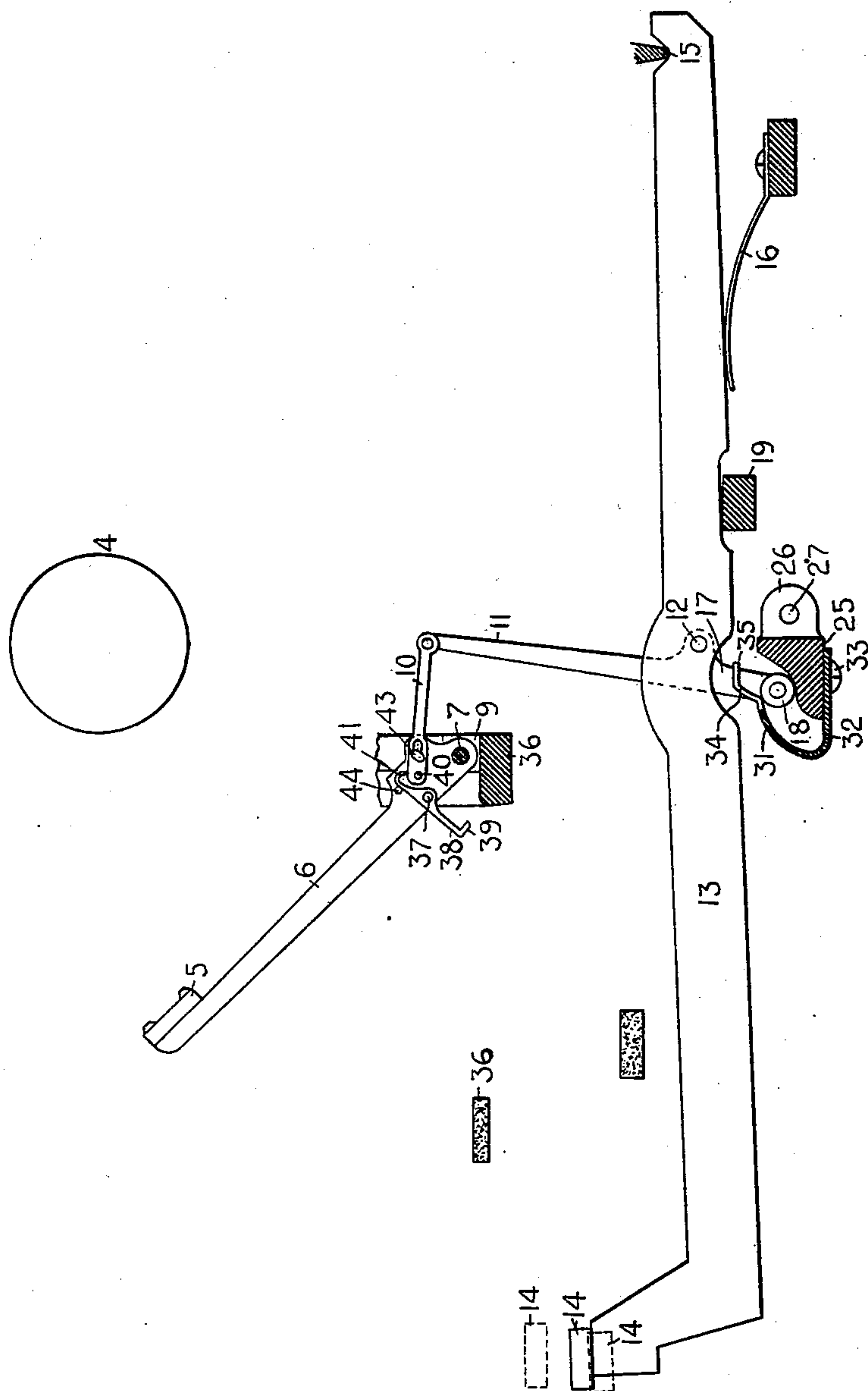
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5 Sheets—Sheet 2.

FIG. 2.



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FIG. 5

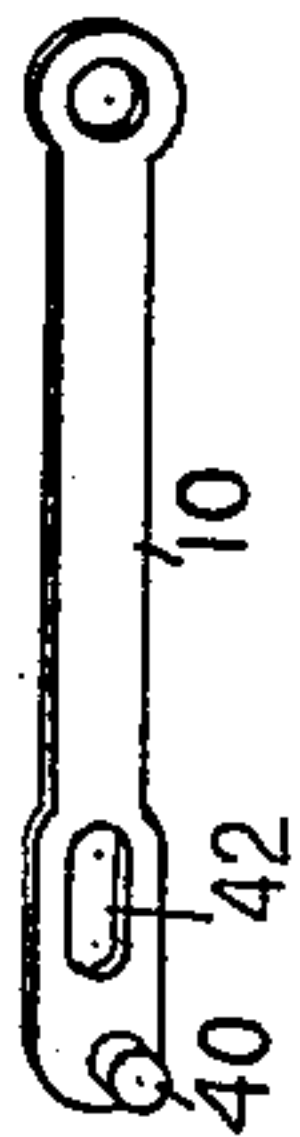


FIG. 4.

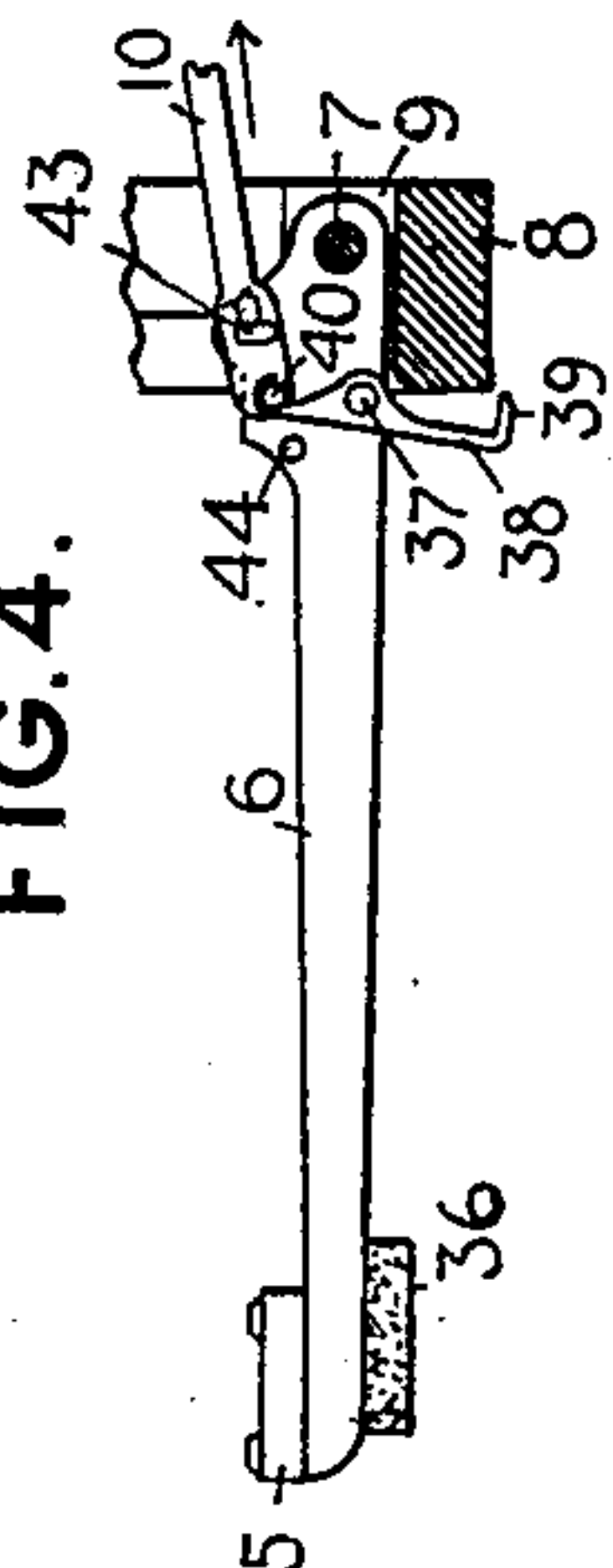
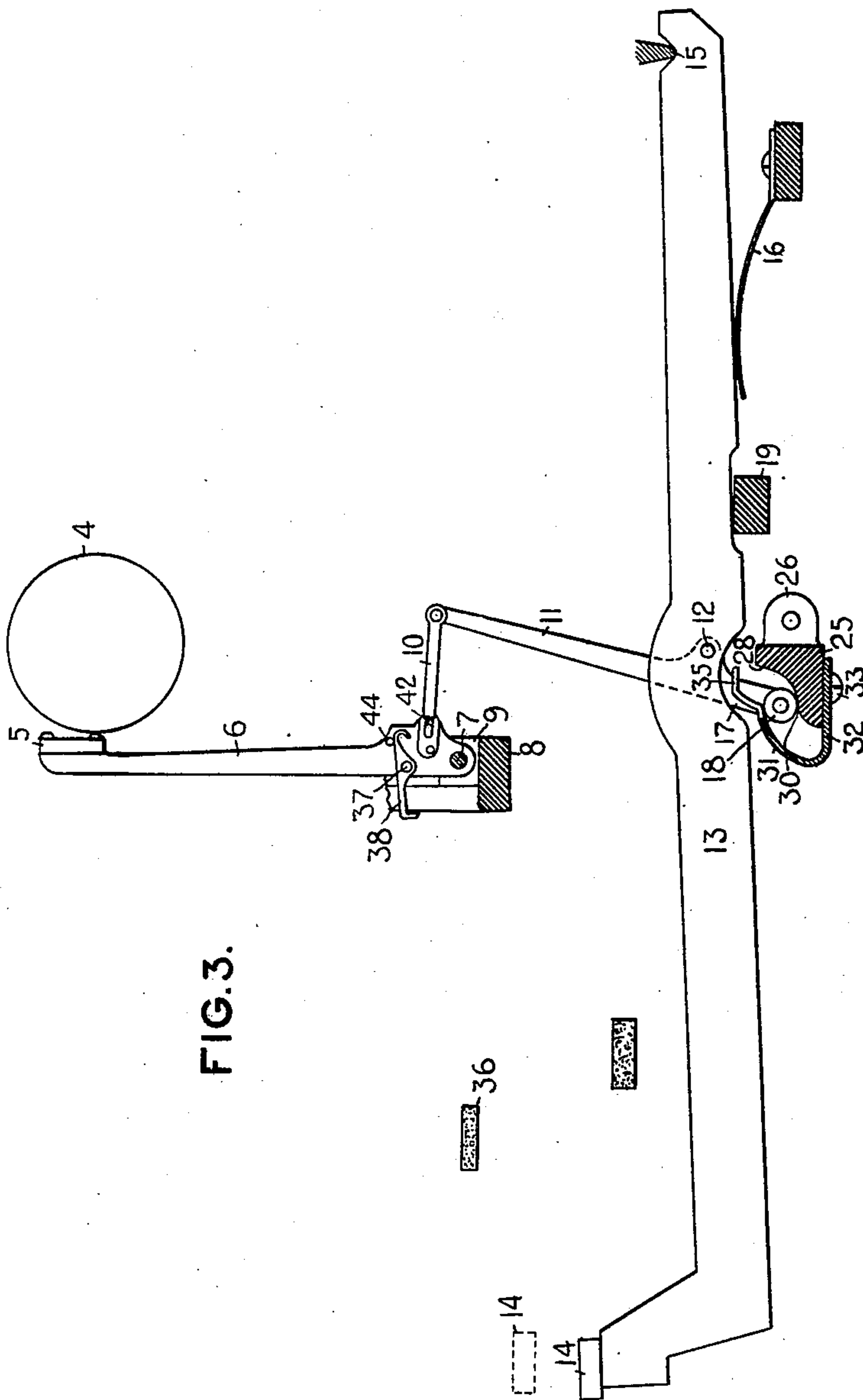


FIG. 3.



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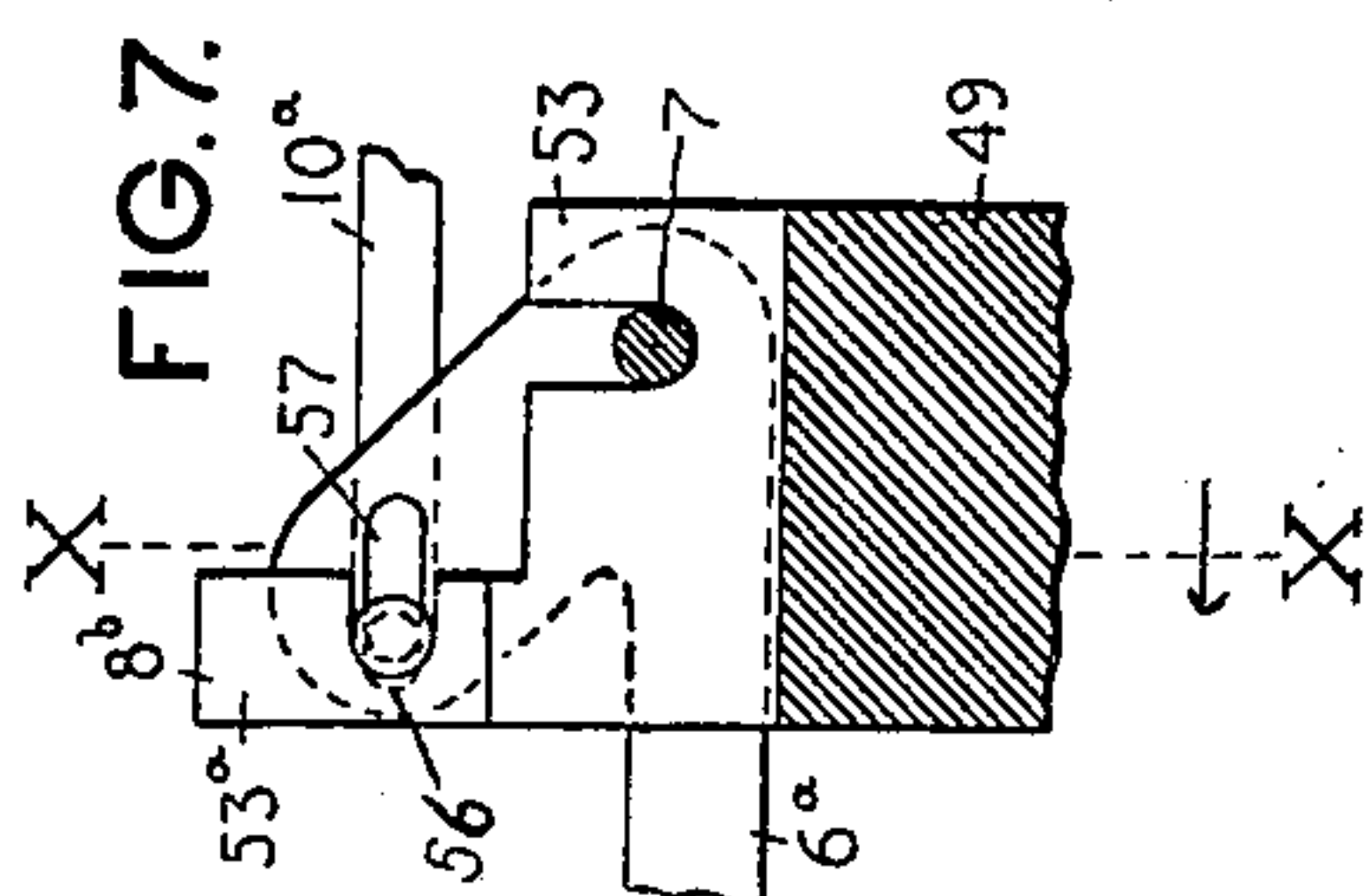
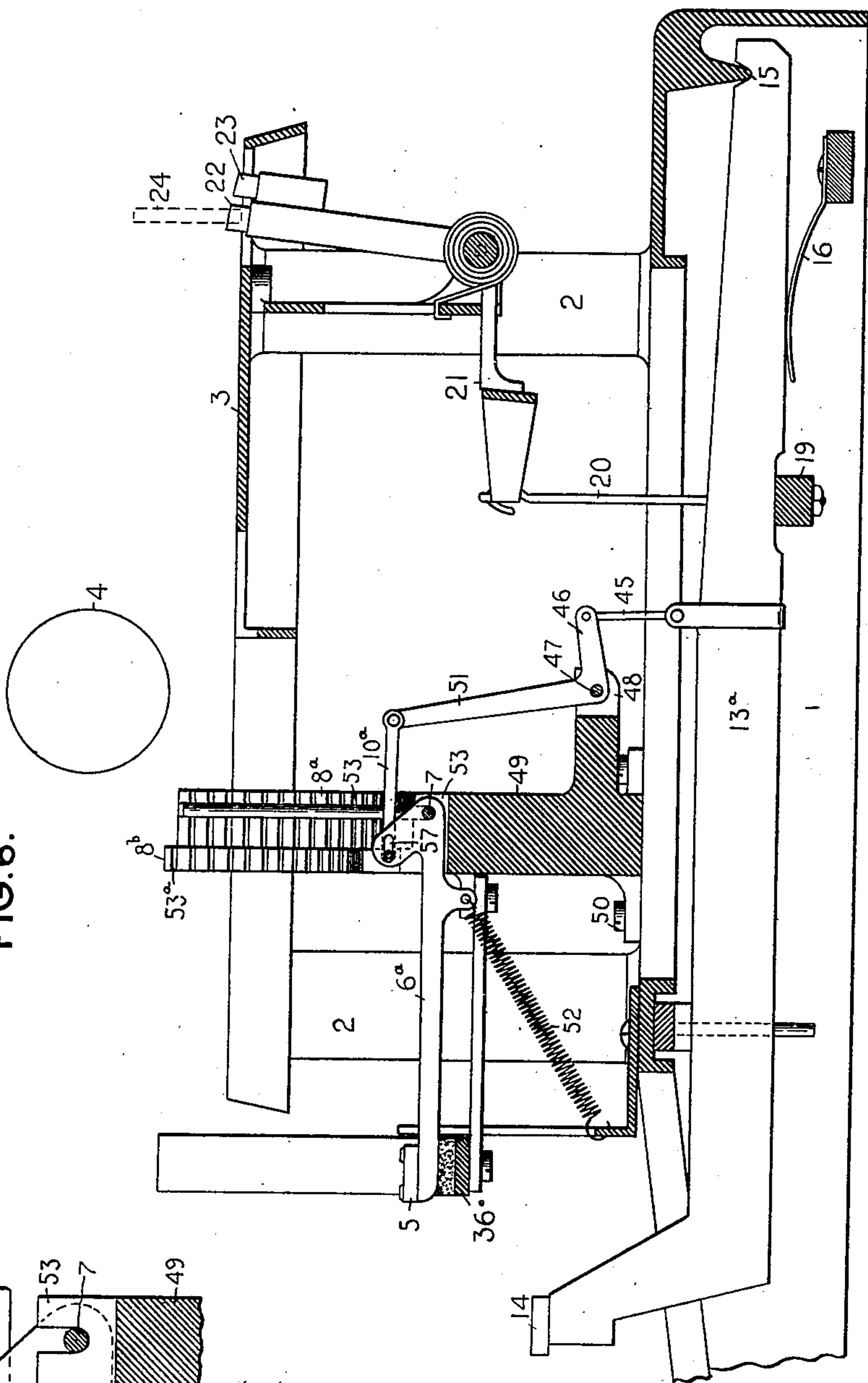
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5 Sheets—Sheet 4.



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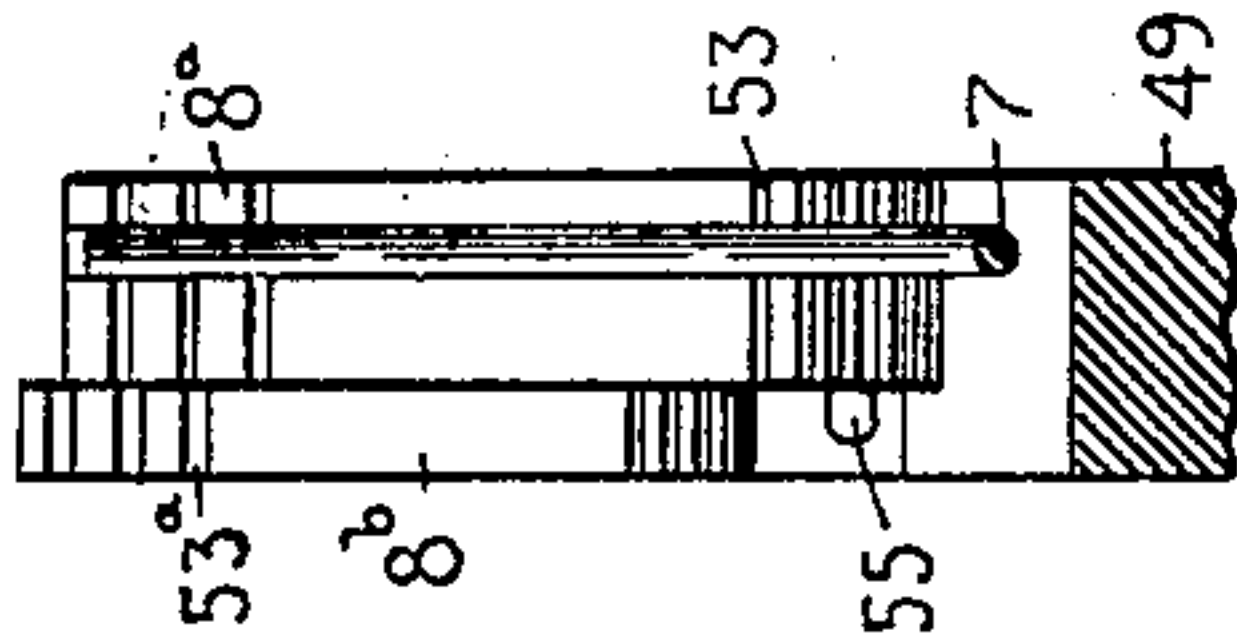


FIG. 10.

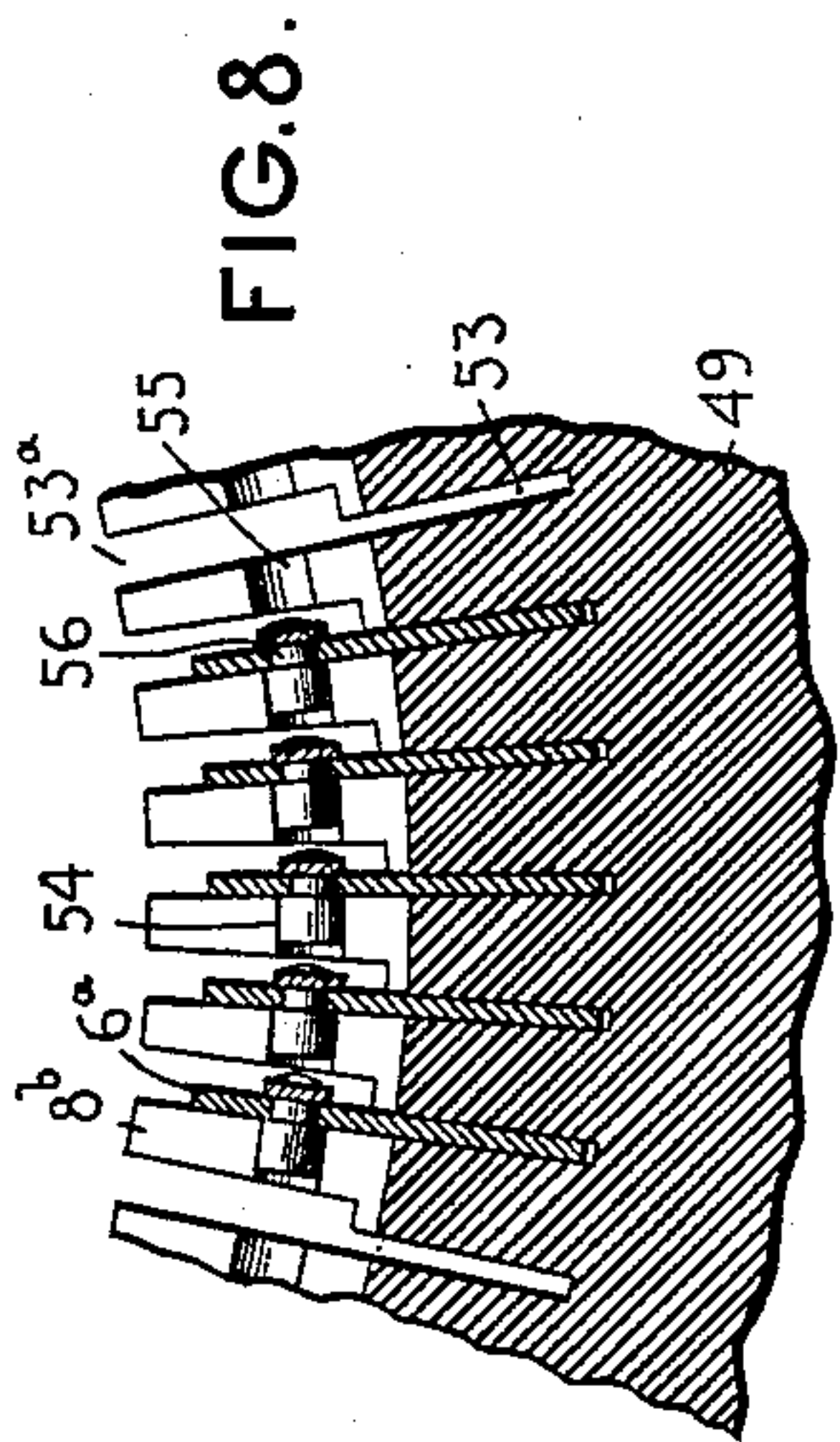


FIG. 8.

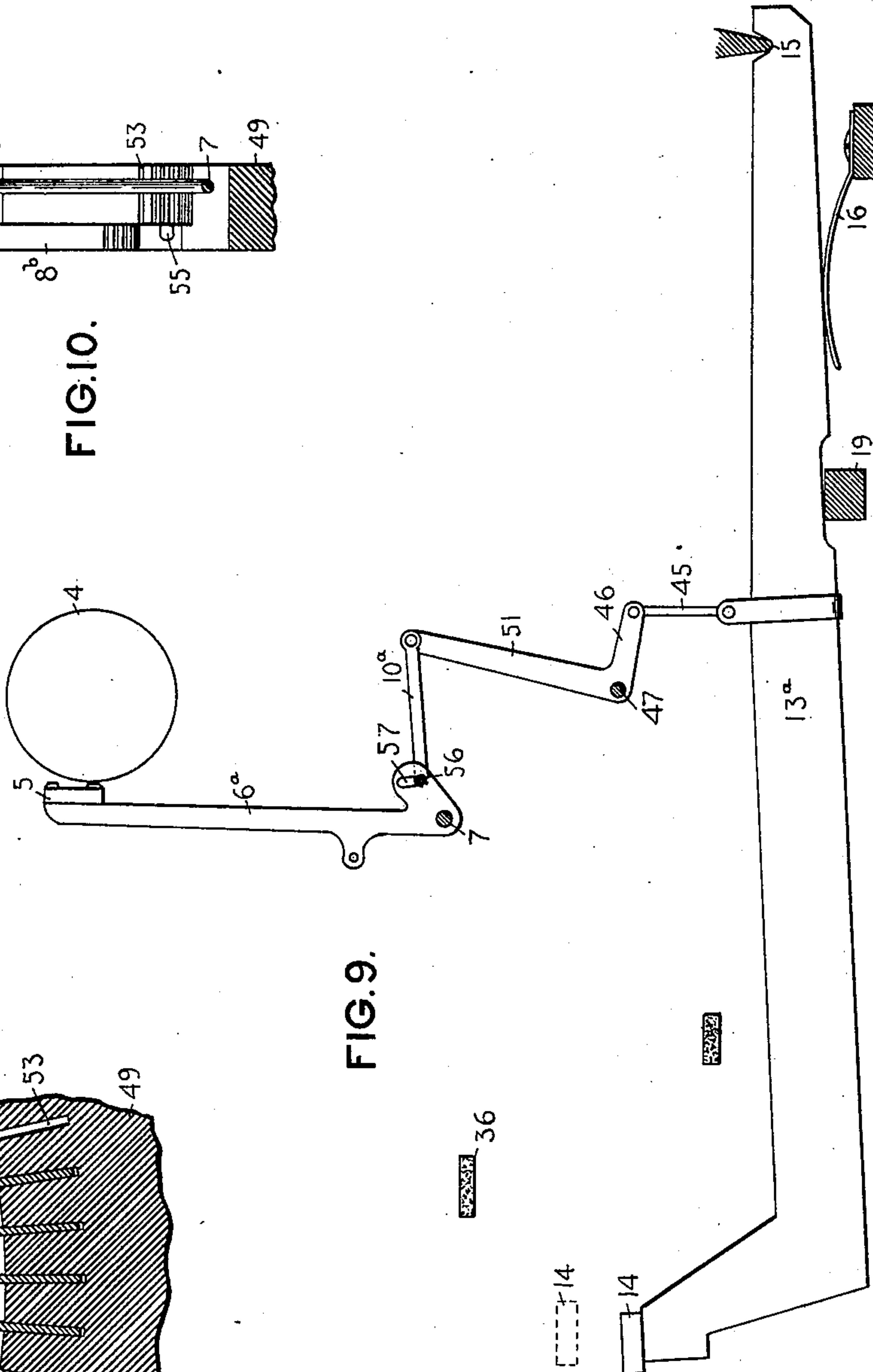


FIG. 9.

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UNITED STATES PATENT OFFICE.

CHARLES H. SHEPARD, OF BROOKLYN, NEW YORK, ASSIGNOR TO WYCKOFF,
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TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 677,706, dated July 2, 1901.

Application filed March 13, 1901. Serial No. 50,907. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. SHEPARD, a citizen of the United States, and a resident of the borough of Brooklyn, city of New York, in the county of Kings and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

This application relates to the type-actions of writing-machines.

One of the objects of the invention is to improve the touch of the keys and increase the speed of operation; and another object is to prevent rebounding of the types by locking them in normal position.

To these and other ends my invention consists in certain combinations of devices, arrangements of parts, and features of construction, all as will be hereinafter fully set forth, and particularly described in the concluding claims.

In the accompanying drawings, Figure 1 is a vertical sectional elevation taken longitudinally and about centrally of a front-strike writing-machine embodying my improvements and showing the parts in normal position. Fig. 2 is a skeleton view similar to Fig. 1, but showing the type half-way between the basket and the platen. Fig. 3 is a similar view to Fig. 2, but showing the type in printing position. Fig. 4 is a fragmentary view of a type-bar and part of its operating means and showing the position assumed by the parts at the initial depression of the key and before the type-bar begins to move. Fig. 5 is a perspective view of a type-bar link. Fig. 6 is a sectional side elevation of a modified type-action, showing the parts in normal position. Fig. 7 is an enlarged fragmentary view of the rear end of the type-bar shown at Fig. 6, showing the segment in which it is mounted and the forward end of the operating-link. Fig. 8 is a fragmentary sectional rear view taken on the line X X of Fig. 7. Fig. 9 is a skeleton view similar to Fig. 6, but showing the parts in printing position. Fig. 10 is a fragmentary sectional elevation of the type-bar segment shown at Fig. 6.

In the several views certain parts are omitted or broken away to disclose the invention more clearly.

Similar parts are designated by similar numerals of reference.

The framework of the machine comprises a base 1, corner-posts 2, and top plate 3, over which is suitably mounted a traveling platen 4. The impressions upon the paper are made by types 5, carried upon the forward ends of rearwardly-striking type-bars 6, whose rear ends are pivoted upon a curved fulcrum-rod 7, fixed in a segment 8, which is provided with radial slots 9 to receive the hubs of the type-bars. The latter are operated by rearwardly-extending links 10, whose rear ends are pivoted to the tips of upwardly-directed cross-levers 11, which are pivoted between their ends at 12 upon horizontally-arranged levers 13, having keys 14 at their forward ends and fulcrumed at their rear ends upon a transverse bar 15, against which they are pressed by a lifting-spring 16. The portion of the lever 11 which extends below its pivot 12 is designated as 17 and carries at its lower end a lateral antifriction-roller 18, which works between fixed opposite cam-surfaces, whereby when the key-lever 13 is depressed and the lever 11 is moved downwardly endwise the lower end of the arm 17 upon the latter is cammed forwardly, and the upper end of the lever 11 is hence swung rearwardly upon the pivot 12, thereby through the link 10 swinging the type-bar up to print. Beneath the key-levers is arranged a transverse universal bar 19, which is suspended by means of hooks 20 upon a dog-rocker frame 21, carrying dogs 22 and 23, which cooperate in the usual manner with an escapement-wheel 24 to control the letter-feeding movements of the platen 4.

The rear cam-surface upon which the roller 18 works is arranged rearwardly of and below said roller and is preferably formed upon the forward side of a transverse horizontal bar 25, fixed at its ends by ears 26 and screws 27 to the side walls of the base. The portion of this cam-surface with which said roller normally contacts slopes obliquely downward and forward at 28 at an acute angle with relation to the direction of movement of the arm 17, so that at the first part of the key depression there is only a comparatively slight vibratory movement of the le-

ver 11 upon the pivot 12, and hence so that the start of the type-bar movement is comparatively slow, thereby avoiding shock to the finger of the operator when the key is sharply struck, as is usual in rapid operation. The slope of said cam-surface gradually becomes more abrupt or more nearly horizontal, forming a curve, as at 29, so that during the key movement the speed of the type-bar may increase. During the final portion of the key-stroke the roller works upon a portion 30 of the cam-surface, which is very nearly horizontal and which is hence arranged at an obtuse angle relatively to the endwise movement of the arm 17, whereby the speed of the type-bar is rapidly increased as it nears the printing-point, thereby accomplishing the twofold object of absorbing the momentum of the operator's hand and causing the type to deliver a sharp blow upon the paper. At Fig. 2 it will be seen that the key has completed about three-fourths of its movement by the time the type is half-way to the platen, the remaining half of the type movement being accomplished by the remaining fourth of the key-stroke. Thus the key-stroke is cushioned both at the beginning and termination thereof, and a satisfactory impression of the type is also insured. The cross-levers 11 extend in a row transversely of the machine, each being provided with a roller 18 for engaging the common cam-surface formed upon the bar 25.

When the key-lever and connected parts are returned to normal position by the spring 16, the movement of the roller 18 is controlled by a cooperative cam-surface, which is substantially parallel with the forward working face of the bar 25, said cam-surface being formed by suitably bending and arranging a plate 31, which extends longitudinally of the bar 25 and whose lower portion may be bent rearwardly at 32 and secured by screws 33 to the under side of said bar, said plate extending the entire working length of the bar and being transversely slotted at 34 to form a comb, within which the arms 17 may play, the points of the comb being bent horizontally at 35 to clear the key-levers when they descend. As the opposite cam-surfaces are substantially parallel throughout their working portions, it will be understood that by contact of the roller 18 with the plate 31 during the upward motion of the key said roller is guided in a path substantially coinciding with the path followed at the downward movement thereof, and hence at the first part of the return movement of the key—that is, from the lower dotted-line position to the full-line position at Fig. 2—the type-bar completes one-half of its return movement to the basket, which is designated as 36. Thus it will be seen that the liability of collision of said type-bar with a succeeding type-bar is reduced to the minimum, and hence the machine may be operated at high speed.

I pivot upon each bar at 37 a depending hook 38, which catches under the forward lower corner of the segment 8 at 39, so that the type-bar upon striking the basket cannot rebound and collide with a subsequently-operated type-bar. I provide upon the extended forward end of the type-bar-operating link 10 a lateral pin 40, which engages an upwardly-extending bent finger 41 upon the catch 38, so that at the initial portion of the rearward movement of said link the catch may be swung upon its pivot 37, thereby releasing the bar, as illustrated at Fig. 4. In order to permit the necessary lost motion of the link, the latter is longitudinally slotted at 42 and engages a shoulder formed upon a stud which projects laterally from the type-bar and has a head 43, which is made oblong, so as to permit detachment of the link 10 when desired. After the latch 38 has been released and during the printing stroke of the type-bar the movements of said latch are immaterial; but in order to prevent displacement thereof when the type-bar is in printing position I provide upon the latter a projection 44, which, as will be seen at Fig. 3, prevents said latch from swinging unduly upon its pivot. During said upward movement of the bar the pin 40 upon the link 10 escapes from the bent finger 41 upon the latch; but during the return movement of the parts said pin reengages said bent finger and by a pressure thereon at the final part of the return movement of the key insures the reengagement of the latch with the segment at 39. Thus the type-bar is always prevented from rebounding, and hence the machine may be operated at high speed without danger of collision, even though the types are assembled in very close order, as in front-strike machines.

Referring now to Figs. 6 to 10, inclusive, the key-levers 13^a are connected by vertical links 45 to the rearwardly-extending arms 46 of a series of bell-cranks, which are pivoted upon a transverse fulcrum-wire 47 and work in vertical slots 48, formed upon a casting 49, extending transversely of the machine and secured upon the side walls of the base by screws 50. Said bell-cranks have upwardly-extending arms 51, which are connected by links 10^a to type-bars 6^a, which are provided with returning-springs 52. These type-bars are pivoted upon a curved fulcrum-wire 7, suitably seated in a segment 8^a, formed upon the casting 49, and provided with radial slots 53, in which the type-bar hubs work. Upon the forward end of each link 10^a is provided a laterally-projecting catch 54, Fig. 8, which normally engages a recess 55, formed upon the casting and opening rearwardly, the above-mentioned radial slots being widened at 53^a to afford a clearance for the forward ends of said links and said recess 55 being formed upon the rear face of an upwardly-projecting ledge 8^b, formed upon the type-bar segment. Shoulders 56 upon the catches 54 engage slots

57, formed in the operating-arms of the type-bars and normally extending in a direction substantially parallel with the links 10^a. By means of these catches 54 upward movement 5 of the type-bars is normally prevented; but upon the depression of a key the link 45 is pulled down, the bell-crank 46 51 vibrated, and the link 10^a drawn rearwardly, thereby withdrawing said catch from the recess 55 10 and releasing the type-bar, the slot 57 in the latter permitting the necessary lost motion of said link. During the further movement of the key said type-bar is pulled upwardly to print, as at Fig. 9. Upon relief of the key 15 from pressure the parts are returned to normal position by springs 16 and 52, the catch 54 reëntering the recess 55 by reason of the reaction of spring 16 and returning the type-bar to normal position, thereby avoiding the 20 possibility of its rebounding and clashing with a subsequently-operated type-bar. If during the return of the parts to normal position the catch 54 should contact with the rear vertical face of the ledge 8^b, it will be 25 understood that the completion of the type-bar movement will not be thereby prevented, since the spring 52 will by its action upon the type-bar cause the latter to exert a camming action upon said stud, forcing it downwardly until opposite the recess 55, where- 30 upon the spring 16 causes said catch to snap into locking position. Where two types on a bar are used, either the platen may be shifted or the type-bars, as may be desired.

35 Many other changes may be made within the scope of my invention, and parts thereof may be used without others.

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

40 1. In a type-writing machine, the combination of a series of type-bars, a series of keys, operative connections extending from the keys to the type-bars, and a series of catches for locking the type-bars in normal position, 45 said catches being releasable by said keys.

2. In a type-writing machine, the combination of a series of type-bars, a series of keys, a series of connections extending from the type-bars to the keys, and a series of catches 50 arranged at the type-bars for locking them in normal position, said catches being releasable by said keys through said connections.

3. In a type-writing machine, the combination with a series of type-bars, of a series of 55 keys, operative connections extending from the keys to the type-bars, and a catch for locking each type-bar in normal position, each of said catches being moved by its key to a releasing position at the initial portion of the 60 printing stroke of the key and before the movement of the type-bar begins.

4. In a type-writing machine, the combination with a series of type-bars, of a series of 65 keys, a series of levers operated by said keys, a series of links, and a series of catches releasable by said links, said catches locking the type-bars in normal position.

5. In a type-writing machine, the combination of a series of type-bars, a series of levers, a series of links connected to said levers and 70 each having a lost-motion connection to its type-bar, and a series of catches movable by said links before the movement of the type-bar begins.

6. In a type-writing machine, the combination 75 with a series of type-bars, of a series of keys, a series of catches, and fixed means cooperating with said catches for locking the type-bars in normal position.

7. In a type-writing machine, the combination 80 with a series of type-bars mounted in a segment, of a series of key-controlled catches cooperating with said segment to lock the type-bars in normal position.

8. In a front-strike writing-machine, the 85 combination with a platen, of a series of rearwardly-striking type-bars, a series of operating-levers connected by links to said type-bars, keys for operating said levers, and catches controlled by said links, said catches 90 operating to lock the type-bars in normal position.

9. In a front-strike writing-machine, the combination with a platen, of a system of rear- 95 wardly-striking type-bars, a system of upwardly-directed levers connected by links to said type-bars, a series of key-bearing levers connected to said levers and extending rearwardly beneath the type-bars, and means releasable by said links for locking the type- 100 bars in normal position.

10. In a type-writing machine, the combination with a series of type-bars, of a series of operating-levers directly connected to said 105 type-bars by type-bar-locking devices, and a series of key-levers connected to said levers.

11. In a front-strike writing-machine, the combination with a platen, of a series of rear- 110 wardly-striking type-bars, a series of upwardly-directed operating-levers therefor, and type-bar-locking devices directly connecting said levers to said type-bars.

12. In a type-writing machine, the combination with a series of type-bars and a series 115 of catches therefor, of a series of key-operated levers having means for releasing said catches and operating said type-bars.

13. In a front-strike writing-machine, the combination with a platen, of a system of 120 rearwardly-striking type-bars, catches therefor, and a system of upwardly-directed key-operated levers having means for releasing said catches and operating said type-bars.

14. In a front-strike writing-machine, the combination with a platen, of a series of rear- 125 wardly-striking type-bars, a segment upon which they are pivoted, a series of catches cooperating with said segment to lock said type-bars in normal position, and a series of upwardly-directed levers having means for 130 releasing said catches and operating said type-bars.

15. In a type-writing machine, the combination with a series of type-bars, of a series

of catches, and a series of operating-levers having means for releasing said catches and operating said type-bars.

16. In a type-writing machine, the combination with a series of type-bars, of a series of key-controlled pivoted catches for locking said type-bars in normal position.

17. In a type-writing machine, the combination with a type-bar, of a lever connected thereto by a slotted link, and a catch controlled by said link, said catch locking the type-bar in normal position.

18. In a type-writing machine, the combination with a series of type-bars, of a series of catches pivotally connected thereto, and keys for releasing said catches and moving said type-bars.

19. In a type-writing machine, the combination with a series of type-bars, of a series of pivoted catches, and a series of key-operated levers for releasing said catches and moving said type-bars.

20. In a type-writing machine, the combination of a type-bar, a key-operated lever, a catch pivoted upon said type-bar, a slotted link connecting said lever to said type-bar, and means upon said link for moving said catch to release the type-bar.

21. In a type-writing machine, the combination with a type-bar, of an operating-lever therefor, and a link connecting said lever to the type-bar, said link having means for locking the type-bar in normal position.

22. In a type-writing machine, the combination with a type-bar, of a catch pivoted thereon, a lever, and a link connected at one end to said lever and at the other end connected to said type-bar and to said catch.

23. In a type-writing machine, the combination with a type-bar, of segment 8, catch 38 pivoted on the type-bar, finger 41 upon the catch, link 10 connected to said finger, and key-operated lever 11 connected to said link.

24. In a type-writing machine, the combination of type-bar 6, segment 8, catch 38 pivoted on said type-bar and engaging said segment, pin 44, finger 41 upon said catch, stud 43 upon said type-bar, slotted link 10 engaging said stud and having pin 40 engaging said finger 41, and key-operated lever 11 to which said link is connected.

25. In a type-writing machine, the combination of a type-bar, a type-bar catch, a spring for said catch, and a key for releasing said catch and moving said type-bar.

26. In a type-writing machine, the combination of a type-bar, a catch, a key for moving said catch and releasing said type-bar, and a spring for returning said key, type-bar and catch to normal position.

27. In a type-writing machine, the combination of a type-bar, a spring-pressed lever connected thereto by a slotted link, and a catch controlled by said link and held in normal position by said spring through said link.

28. In a type-writing machine, the combination of a series of type-bars, a series of key-

operated levers, and a fixed cam for vibrating said levers so as to speed the type-bars as they approach the printing-point.

29. In a type-writing machine, the combination of a type-bar, a lever connected thereto, means for moving the lever endwise, and a fixed cam for vibrating said lever during the endwise movement thereof.

30. In a type-writing machine, the combination of a series of type-bars, a series of key-bearing levers, a series of sublevers pivoted upon said key-bearing levers, and connected to said type-bars, and a fixed cam arranged transversely of said sublevers and engaged thereby for vibrating said sublevers and speeding the type-bars as they approach the printing-point.

31. In a type-writing machine, the combination of a series of type-bars, a series of key-levers, a series of sublevers pivoted on said key-levers and connected to said type-bars, and a transverse fixed bar having an oblique face engaged by the ends of said sublevers.

32. In a type-writing machine, the combination of a type-bar, a lever connected thereto, means for moving said lever endwise, a roller on said lever, and a fixed cam engaged by said roller, said cam being obliquely disposed so as to cause a vibration of said lever during the endwise movement thereof.

33. In a type-writing machine, the combination of a series of type-bars, a series of operating-levers therefor, cam-bar 25 arranged transversely of said levers and engaged thereby, coacting cam-plate 31 arranged opposite to said cam-bar, and slots 34 formed in said cam-plate for receiving said levers.

34. In a front-strike writing-machine, the combination with a platen, of a series of rearwardly-striking type-bars, a series of key-levers extending beneath said type-bars, a series of upwardly-directed cross-levers pivoted on said key-levers, bar 25 fixed transversely below said key-levers and having a forwardly and downwardly sloping cam-surface, rollers 18 on the lower ends of said cross-levers, and fixed cam-plate 31.

35. In a front-strike writing-machine, the combination with a series of rearwardly-striking type-bars, of a series of key-levers extending rearwardly beneath said type-bars, a series of upwardly-directed cross-levers pivoted upon said key-levers, rollers 18 upon the lower ends of said cross-levers, and fixed transverse cam-bar 25 engaged by said rollers.

36. In a front-strike writing-machine, the combination with a platen, of a system of rearwardly-striking type-bars, key-levers 13 extending rearwardly beneath the type-bars, cross-levers 11 pivoted on said key-levers and connected to said type-bars, rollers 18 upon the lower ends of said cross-levers, cam-bar 25 arranged transversely and engaged by said rollers, coacting cam-plate 31, and springs 16.

37. In a type-writing machine, the combination with a series of type-bars, of a series of levers connected thereto, means for mov-

ing said levers endwise, rollers upon the ends of said levers, transverse bar 25 engaged by said rollers, and cam-plate 31 secured upon said bar and having slots 34 for receiving said
5 levers.

38. In a type-writing machine, the combination with a type-bar, of an endwise-movable lever connected thereto, and a fixed cam having both a sloping face 28 arranged at an
10 acute angle to the endwise movement of said lever and a sloping face 30 arranged at an obtuse angle to the endwise movement of said lever, so as to speed the type-bar as the latter approaches the printing-point.

39. In a type-writing machine, the combination with a type-bar, of an endwise-movable lever connected thereto, and a fixed cam having both a sloping face 28 arranged at an
15 acute angle to the endwise movement of said lever and also a sloping face 30 arranged at an obtuse angle to the endwise movement of

said lever so as to speed the type-bar as the latter approaches the printing-point, said cam also having an intervening curved portion
25 29 between the sloping faces 28 and 30.

40. In a front-strike writing-machine, the combination of a platen, a series of rearwardly-striking type-bars, a series of key-levers extending beneath said type-bars, a series of cross-levers pivoted on said key-le-
30 vers and connected to said type-bars, rollers 18 upon said cross-levers, and a fixed transverse cam-bar 25 arranged rearwardly of and below said rollers.

Signed at the borough of Manhattan, city
35 of New York, in the county of New York and State of New York, this 12th day of March, A. D. 1901.

CHARLES H. SHEPARD.

Witnesses:

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E. M. WELLS.