

No. 755,420.

PATENTED MAR. 22, 1904.

A. WAYNE.  
WRITING MACHINE.

NO MODEL.

APPLICATION FILED JULY 13, 1903.

2 SHEETS—SHEET 1.

Fig 1

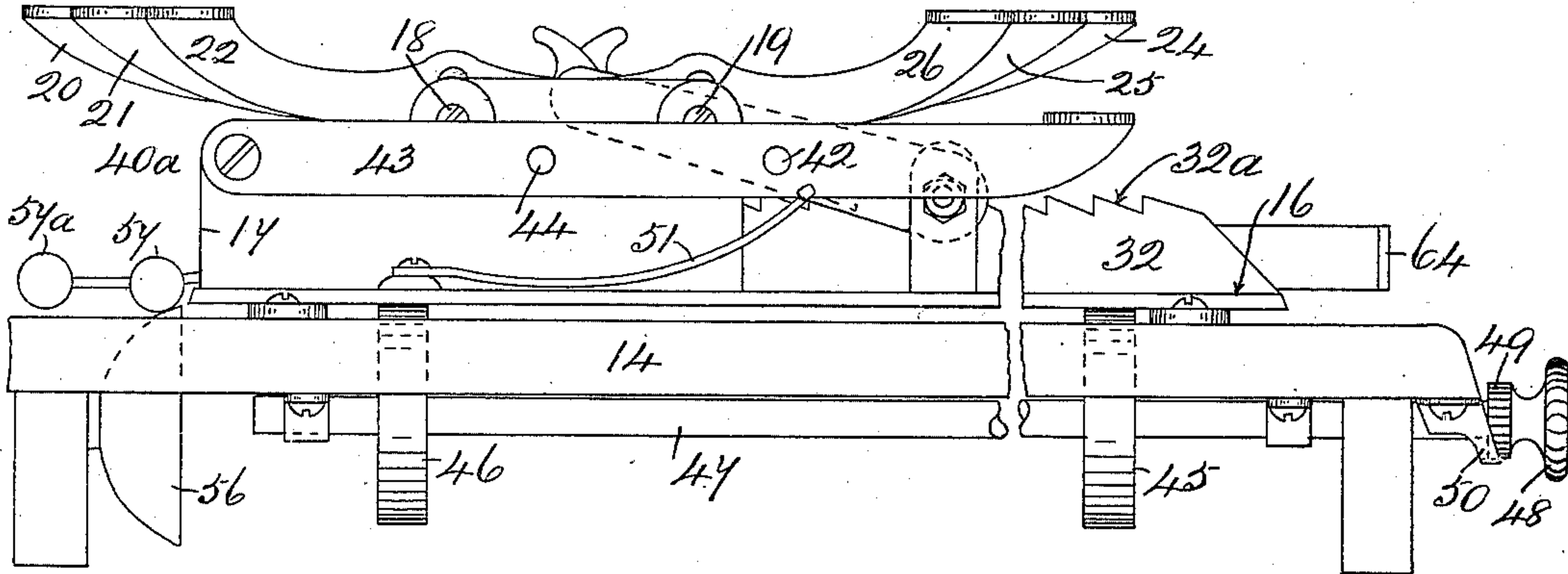


Fig 2

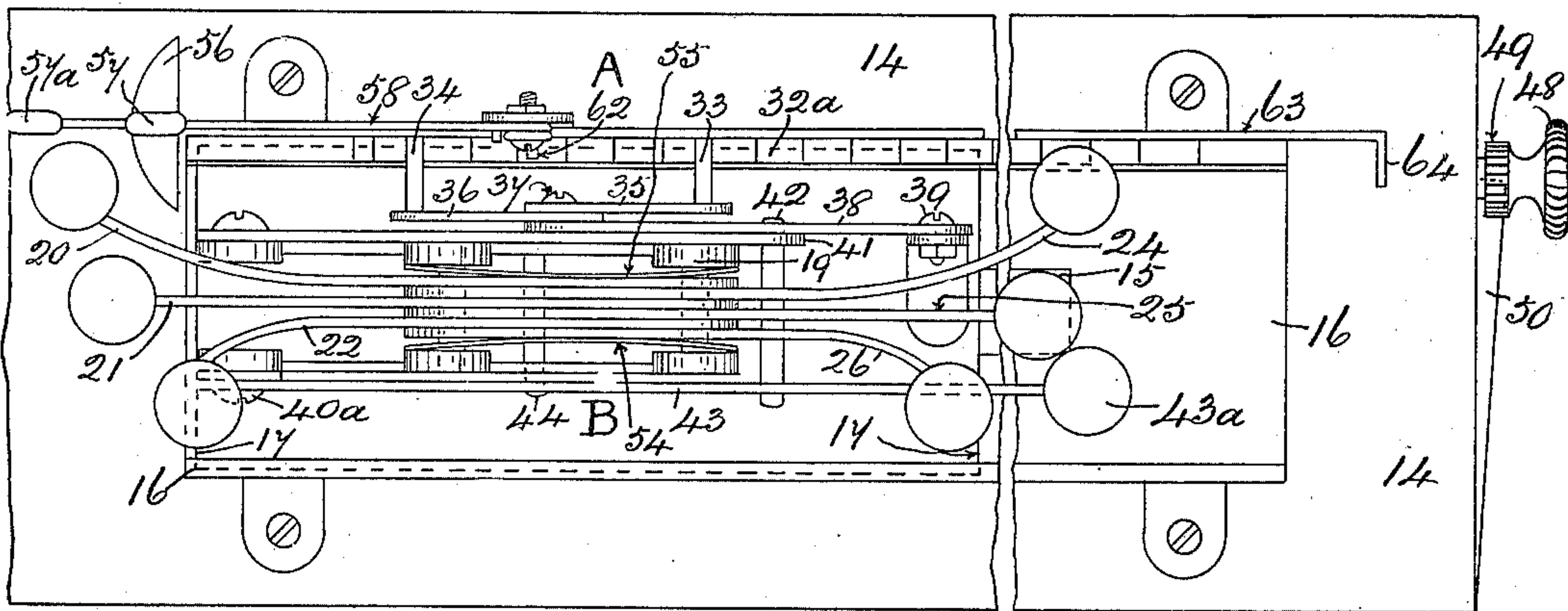
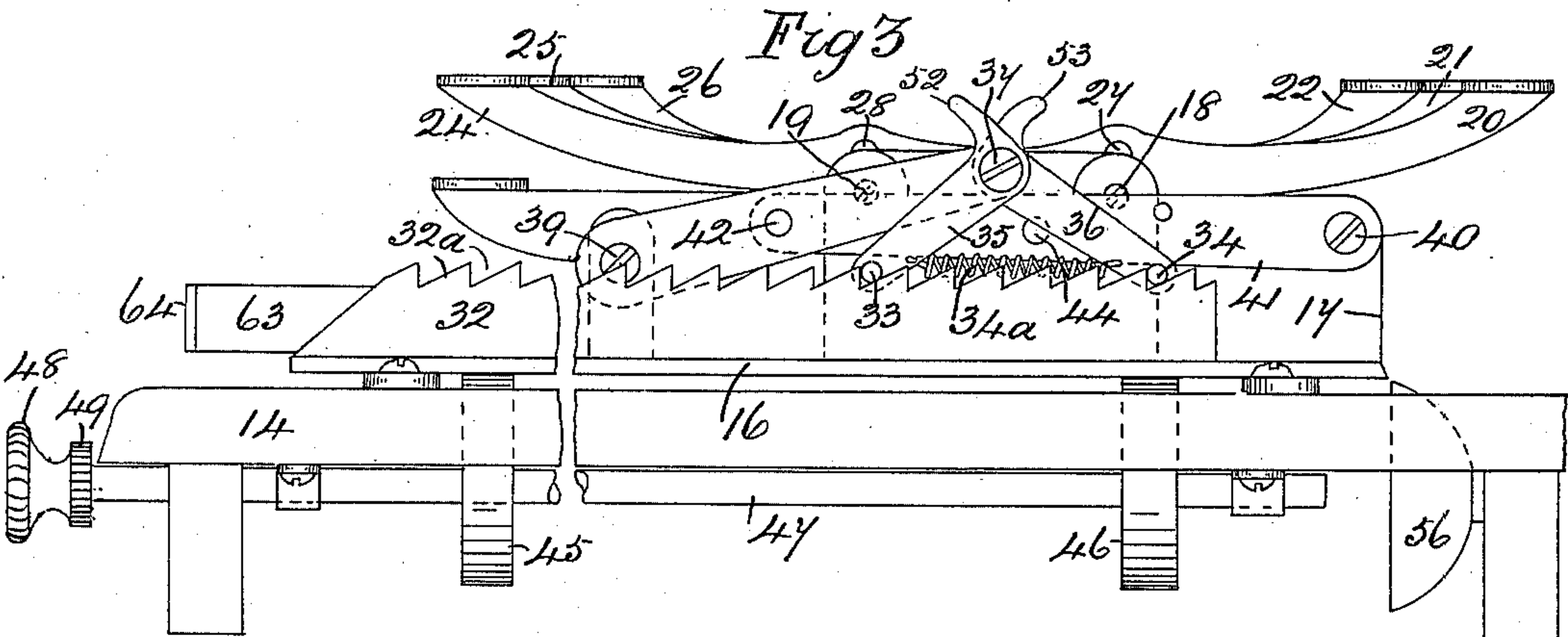


Fig 3



Witnesses

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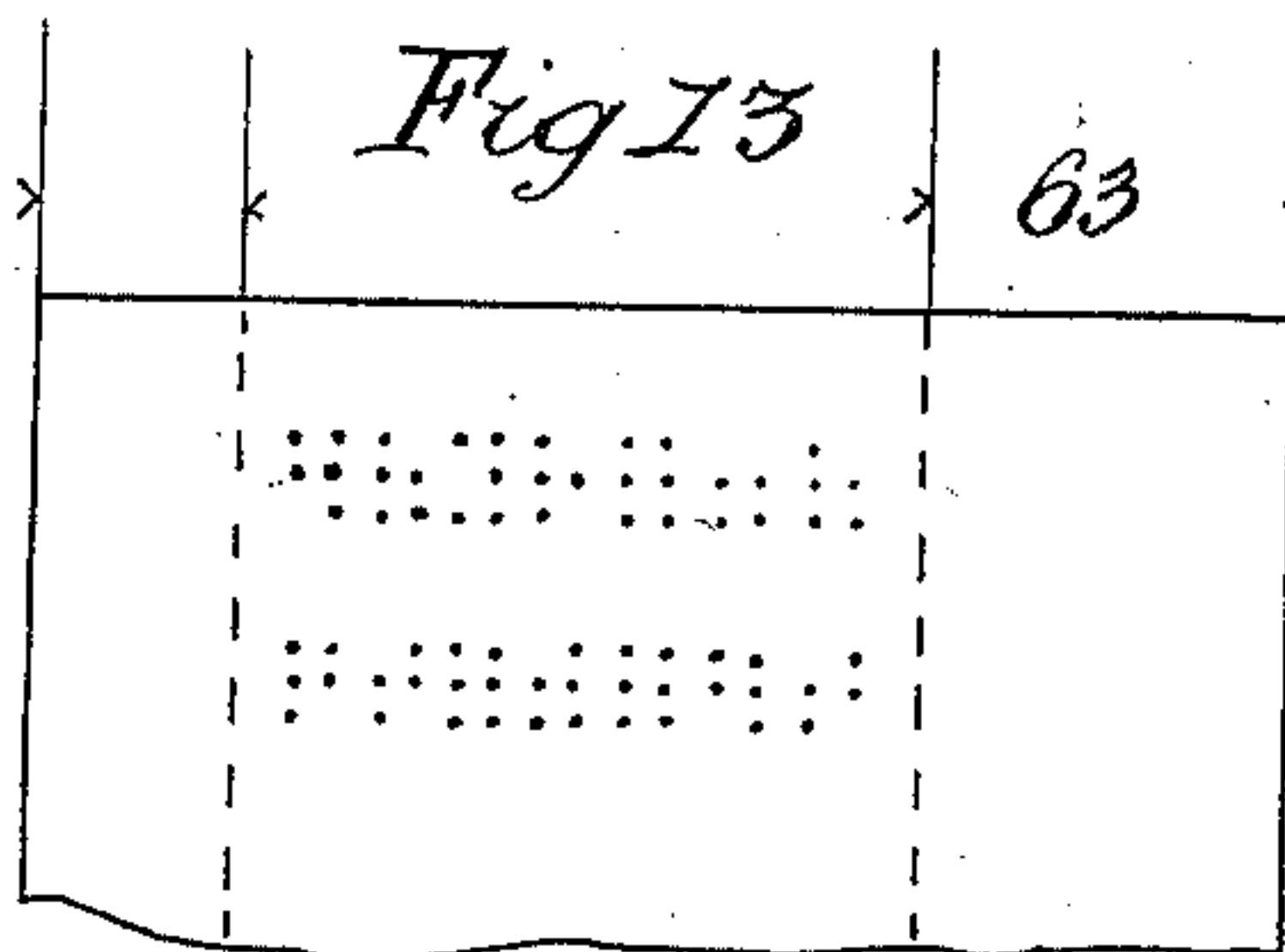
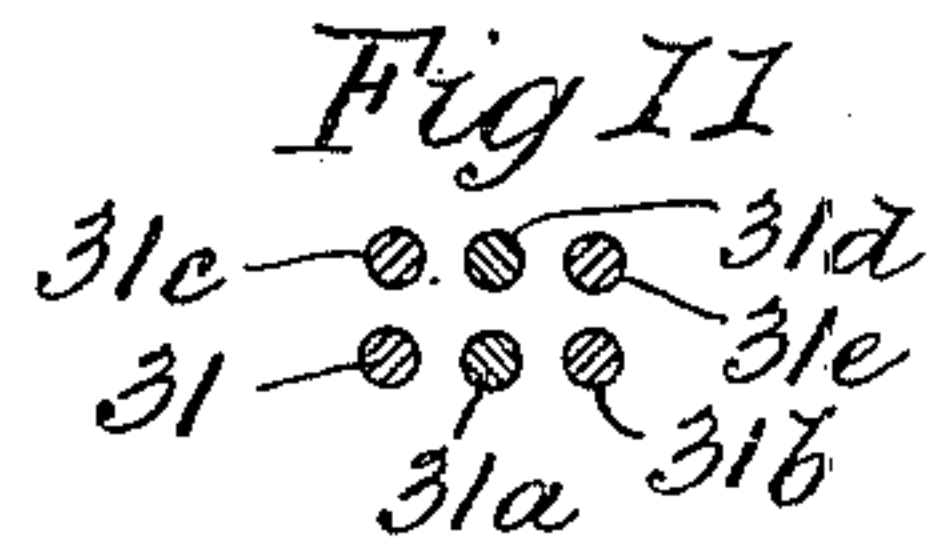
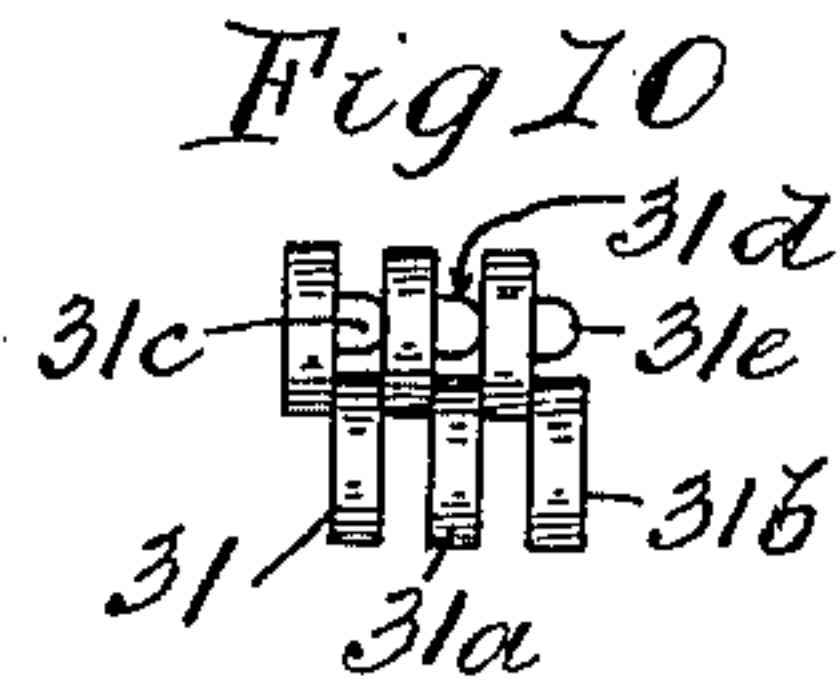
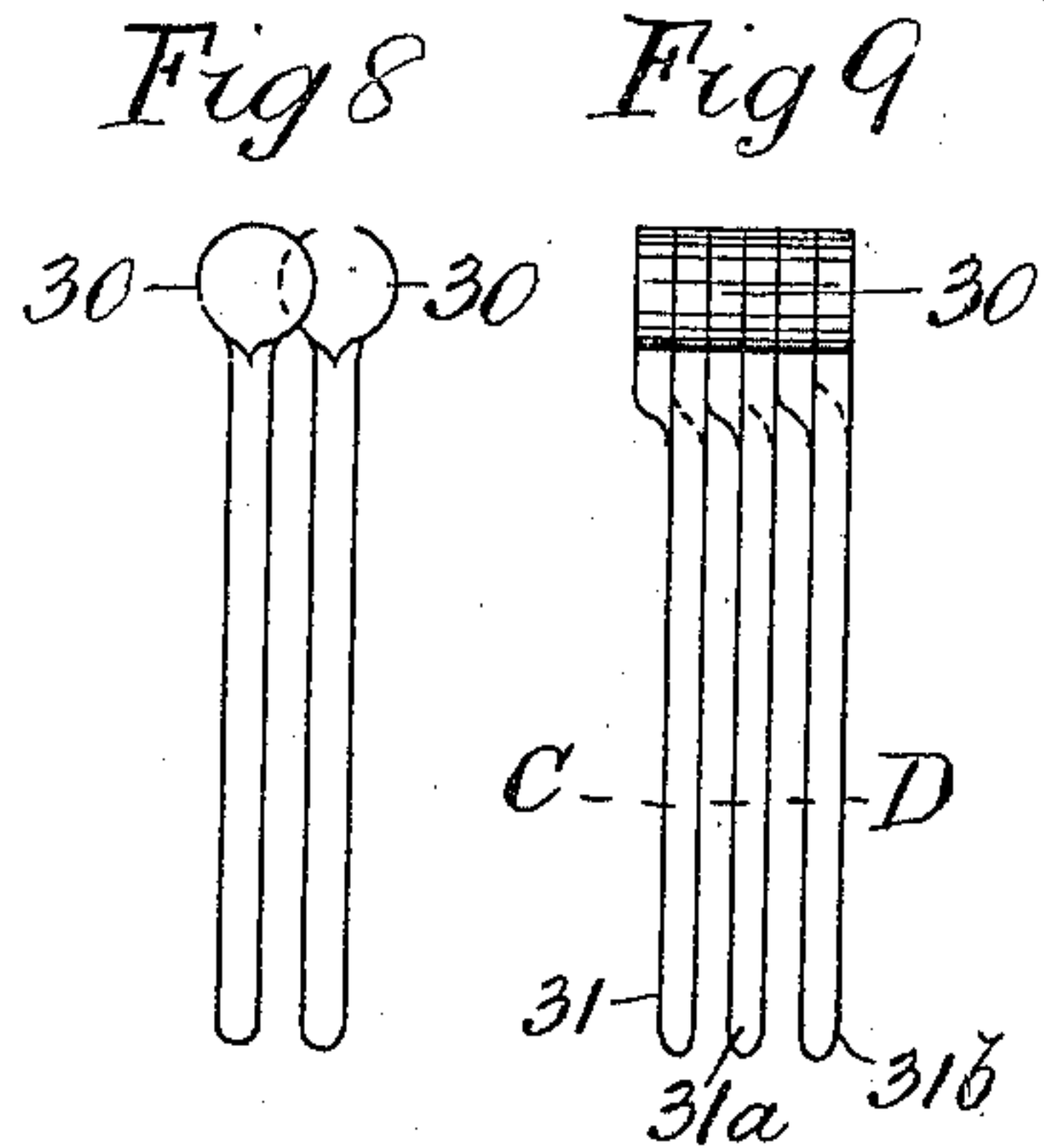
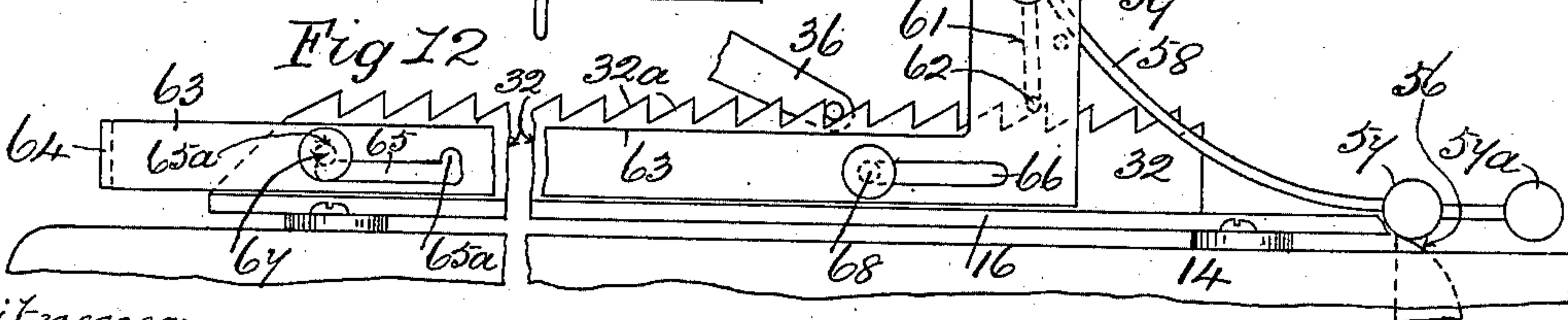
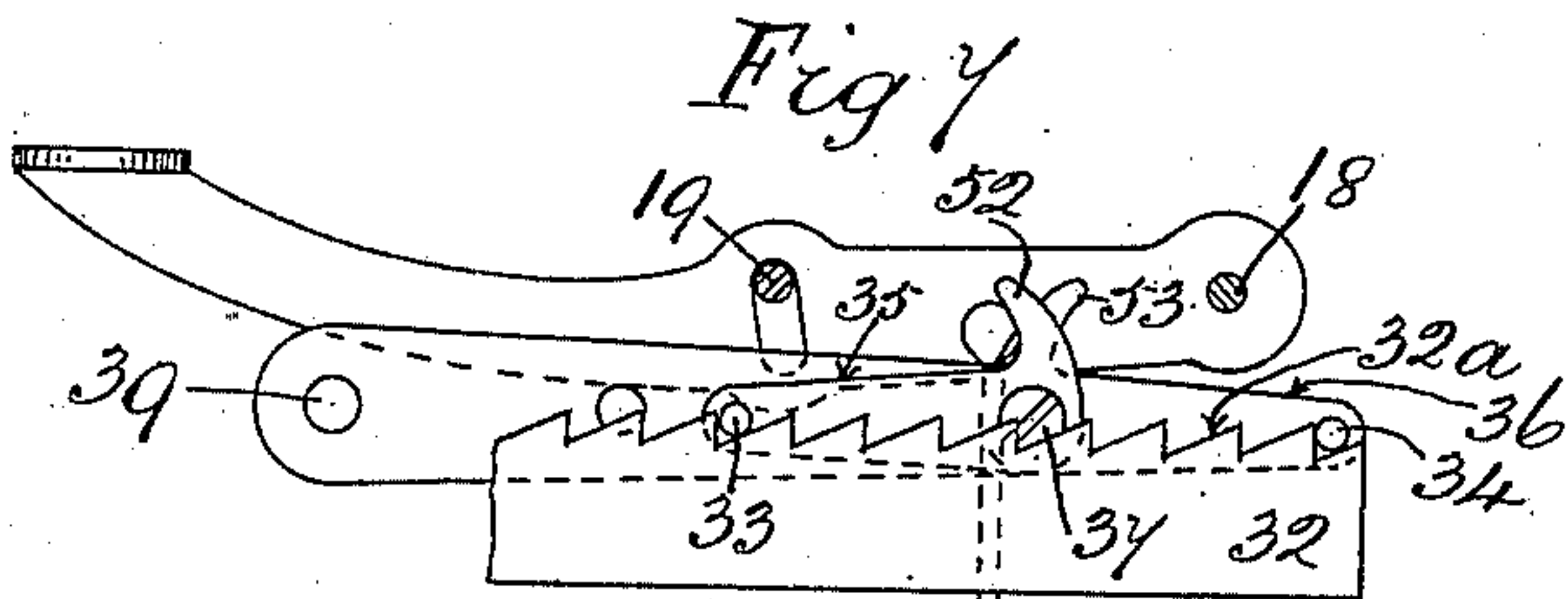
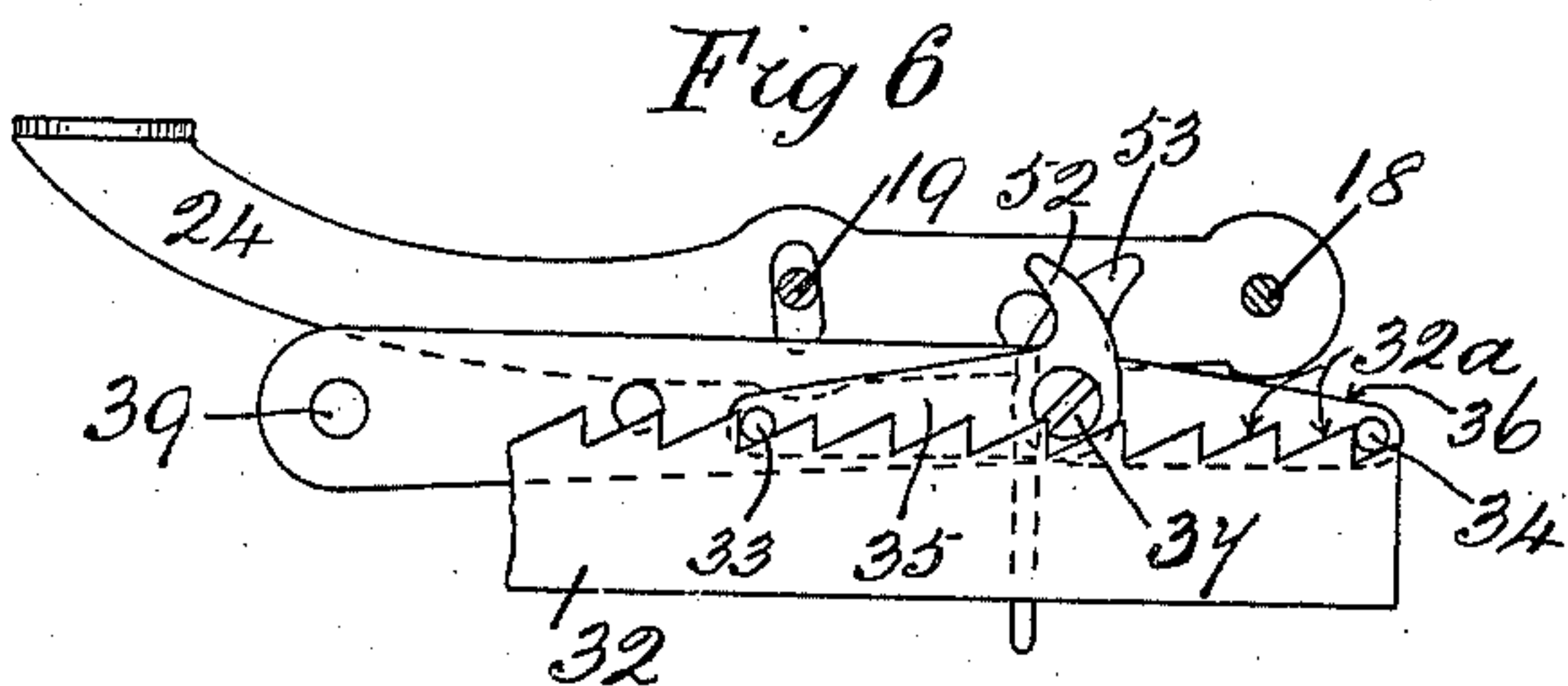
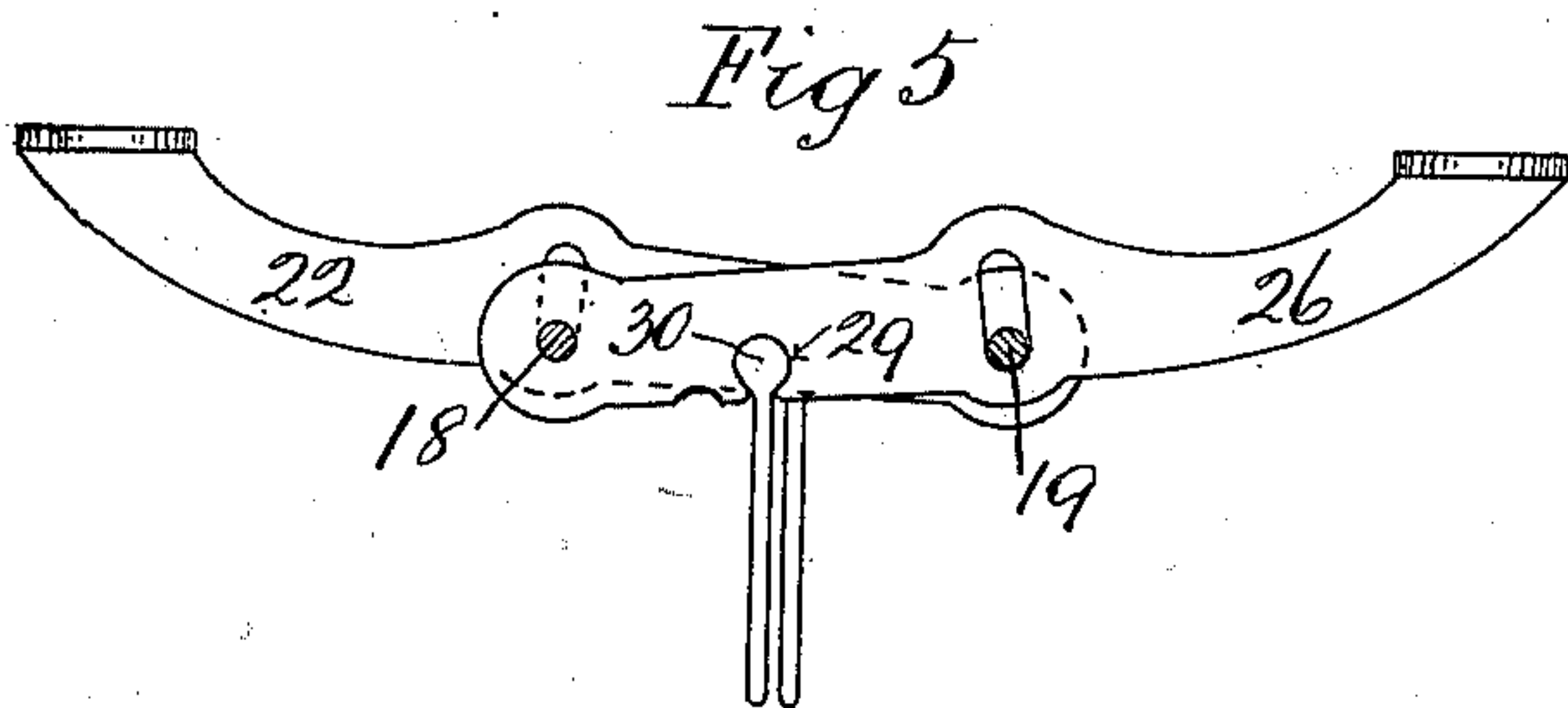
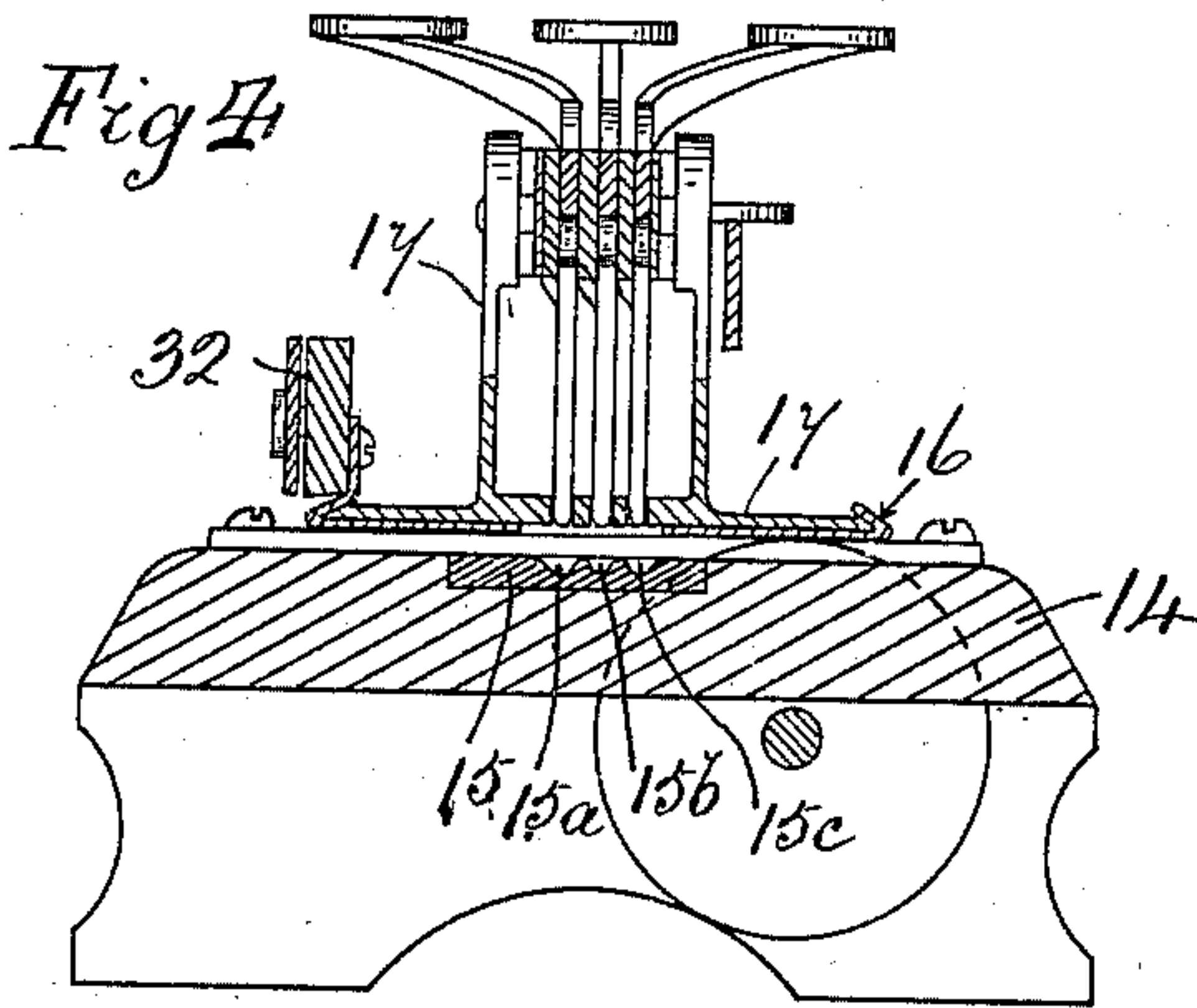
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C. Hayward Powell  
J. Bernard Hayward

Inventor  
Alfred Wayne  
per Charles J. Powell  
Attorney.



# UNITED STATES PATENT OFFICE.

ALFRED WAYNE, OF HANDSWORTH, ENGLAND.

## WRITING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 755,420, dated March 22, 1904.

Application filed July 13, 1903. Serial No. 165,366. (No model.)

*To all whom it may concern:*

Be it known that I, ALFRED WAYNE, a subject of the King of Great Britain, and a resident of 55 Church Hill road, Handsworth, in the county of Stafford, England, have invented certain new and useful Improvements in Writing-Machines, of which the following is a specification.

My invention relates to improvements in writing-machines, and refers to machines intended for the use of the blind in which characters are indented by means of styles upon the sheet of paper, so that the reverse raised characters may be easily read by touch.

The objects of this invention, broadly, are to provide means by which the carriage which carries the styles shall travel along the writing-line upon the paper, so that the paper is moved (a space forward) only after each line has been written, also means whereby in combination with an automatic traveling style-carriage the writing is effected upon a flat sheet of paper, also improved means for automatic travel of style-carriage, also means for producing the writing in a given position upon both sides of the paper, also improved arrangement of carrying the styles in the depressing-levers, and also an improved disposition of the depressing-levers. These various improvements are illustrated in the accompanying drawings, in which—

Figure 1 is a front view, and Fig. 2 a plan view, and Fig. 3 a rear side view, of this my invention. Fig. 4 is a sectional detail showing the disposition of the styles, the indenting-bed, and paper-feed rollers. Fig. 5 shows the method of carrying the style in the depressing-lever. Figs. 6 and 7 show the advance travel mechanism in the second and third positions of its movement. Figs. 8, 9, and 10 are enlarged detailed side, front, and plan views, respectively, of the styles; and Fig. 11 is a sectional plan view of the styles on lines C D, Fig. 9. Fig. 12 is a rear side view of the warning and arresting mechanism to the travel of the operative carriage. Fig. 13 is a diagraphic view of a sheet of paper, showing marginal arrangements.

14 is a table upon which the various parts

of the machine are carried and upon which the grooved indenting-bed 15 is secured, having the three grooves 15<sup>a</sup>, 15<sup>b</sup>, and 15<sup>c</sup> formed along the whole of its length.

16 is a slideway-plate having an opening giving access to the bed 15 and in which freely slides the carriage 17. Upon this carriage are secured the cross-bars 18 and 19. The levers 20, 21, and 22 are pivotally carried at their ends on bar 19, while the levers 24, 25, and 26 are pivotally carried at their ends on bar 18. In levers 20, 21, and 22 slot-holes 27 are formed, through which passes the bar 18, and similarly in levers 24, 25, and 26 is formed the slot-hole 28, through which passes the bar 19. In each of these levers a part circular hole 29 is made, in which movably fits the head 30 of each of the styles 31, 31<sup>a</sup>, 31<sup>b</sup>, 31<sup>c</sup>, 31<sup>d</sup>, and 31<sup>e</sup>. The heads 30 are flat at their sides, their thickness being equal to that of the thickness of their respective levers and capable of the little part rotative movement necessary. Their points are shaped as may be necessary, but usually of a hemispherical form. The position of the styles is such that two enter each groove in the bed 15. Hence one or more or all of such styles may be simultaneously pressed into their respective grooves by means of their respective levers.

The intermittent travel of the carriage 17 is effected in the following manner and by the following means: 32 is a plate upon which are formed rack-teeth 32<sup>a</sup>, in which engages the pawl-studs 33 and 34, which latter are carried upon the levers 35 and 36, these levers being pivoted at 37 to the lever 38, which is pivotally carried at 39 upon the carriages 17. The two pawls are drawn toward each other by the spring 34<sup>a</sup>. At 40 is pivoted the lever 41 to the carriage 17, and its outer end is rigidly connected to the cross-bar 42, which said cross-bar is also rigidly secured in the space-depressing lever 43, which is pivoted at 40<sup>a</sup>, which is coincident with pivot-joint 40. A cross-bar 44 is also carried across from lever 43 to lever 41 and rigidly secured to both.

45 and 46 are rubber or the like rollers secured on spindle 47, which may be revolved by handle or knob 48. Upon the spindle is



the ratchet 49, into whose teeth the spring-catch 50 engages, so that when the knob is turned the catch 50 perceptibly falls successively into the ratchet-teeth, so that the operator can readily tell how far the rollers 45 and 46 have been turned. Between the under side of the plate 16 and the upper side of the table 14 the paper upon which the writing is to be made passes, and thence between the rollers 45 and 46 and the plate 16, so that by the rotation of the said rollers the paper is fed forward from line to line, as may be required.

The action of the parts thus far described may be now explained as follows: By pressing down either of the finger-levers its own particular style is pressed onto the surface of the paper so as to indent it—that is to say, it produces upon the under surface an elevation which represents a letter or other determined character. Also the simultaneous pressure of any combination of two or more styles represents a letter or other determined character. Hence from six of such styles it is found that a sufficient number of combinations may be obtained for usual writing purposes. By placing the style of each lever between the center of the styles and the fulcrum the elevations produced on the reading side of the paper when being read occupy the same relative position to each other as the various finger-tips upon the levers which have produced them bear to each other. With each depression or marking the carriage is moved forward a space as follows: Say, for instance, lever 26 is depressed. In doing so the said lever not only pushes down the style 31<sup>b</sup>, but also pushes down the bar 42 against the resistance of the spring 51, and thereby the lever 41 is pressed downward, and consequently the lever 38 is depressed by reason of its connection with the lever 41. As the lever 38 is pushed down and carries with it the joint 37 the two pawls 33 and 34 are extended from each other, (see Fig. 6,) and inasmuch as the pawl 33 rests against a ratchet-tooth 32<sup>a</sup> and cannot move backward the pawl 34 is moved forward over and falls behind a tooth, as shown in Fig. 7, and therefore this pawl cannot return. Consequently as the finger-pressure is released from the lever 26 the spring 51 raises the mechanism back into its normal position, as shown in Fig. 3, in which movement the pawl 33 is drawn forward over a tooth 32<sup>a</sup>, and hence the carriage 17 has moved a space forward. The same movement of travel of the carriage takes place when either of the keys 20, 21, or 22 are depressed, because they communicate motion to the pawl-levers 35 and 36 by pushing down the bar 44, which said bar is rigidly secured to lever 41, similarly to bar 42, and thence the several movements take place, as before described. Hence upon every depression of a finger-lever it may be said

that three things take place—first, the depression causes the carriage to travel forward part of its distance during the advance of the pawl 34 over its tooth; secondly, the lever is depressed still farther to give the indentation or marking on the paper during which the carriage does not move, and, thirdly, on the release of pressure the lever returns, and the carriage is pulled forward to the full extent of travel.

Upon the levers 35 and 36 are thumb and finger tips 52 and 53, respectively, by which the levers may be raised simultaneously, so as to lift the pawls clear of the rack-teeth 32<sup>a</sup>, when the carriage 17 may be moved back to the starting-point for a fresh line.

I would here point out that when any given lever is depressed, that although the other levers may from gravitation follow its downward movement, still no pressure rests upon the other levers, and therefore no marking would take place except by the style of the particular lever or levers pressed.

With a view to keeping the levers close together and to hold the styles sidewise in their levers the flat springs 54 and 55 are carried on the pivot-bars 18 and 19 and press at their center against the levers, the friction from which also tends to lessen the free downward movement of the said levers.

56 is an alarm-bell suitably carried upon the table-leg or other part.

57 is the striker, carried upon the arm 58, pivoted at 59 to bracket 60. To the arm 58 is connected the short arm 61, having the crank 62. Now when the pawl 34 is passing over the rack-tooth where the crank 62 is situated the said crank 62 is lifted and then falls, and the bell is rung, thus warning the operator that the end of the line is a given distance away.

In writing of this class it is sometimes desirable that the paper should be written on both sides and that a wider margin 63 should be left along one edge of the page than along the other, so that such wider margin permits of the sheets being bound into book form. To do this, it will be readily understood that the side of the paper first written on, the wider margin 63, (see Fig. 13,) would be to the right hand, so that when turned over to be read from the other side it would lie to the left hand. When the same sheet is turned to be written upon, the writing would be commenced so as to leave the narrower margin on the right hand. Consequently the starting position of the carriage must be changed for each side of the paper. For this purpose the bracket 60 (see Fig. 12) is made part of the plate-bar 63, which extends to the other end of the rack 32 and terminates with a cranked stop 64, which is turned inward, so that the carriage 17 is thereby arrested. In this plate are slot-holes 65 and 66, which rest and slide upon the



studs 67 and 68, secured in rack-plate 32. 65<sup>a</sup> represents locking-notches in slot-hole 65, so that by raising the end of the plate-bar 63 it may be moved to the right or left to the extent  
 5 of the slot-holes, at either end of which it will be locked by the stud 67 engaging with one or the other notches 65<sup>a</sup>. Hence when the wider margin on the paper is required at the start of the line the stop 64 is moved inward, or  
 10 vice versa. To accommodate this arrangement, I provide a second striker 57<sup>a</sup>, so that in either of the two positions of the bar-plate 63 one or the other striker shall be in a position to give the desired warning.

15 Referring back to the indentation-bed, I would point out that the corrugated form appears to answer best; but, if desired, I may make it of a plain but yieldable surface, such as of india-rubber or the like, which will permit the indenting-pressure from the marking-  
 20 styles.

The lever 43 is furnished with a finger-tip 43<sup>a</sup>, similar to the other levers, so that it may serve as what is known as a "spacing-key"—  
 25 that is, it may be depressed when a forward movement of the carriage is required only for a space between two characters.

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

30 1. In a writing-machine, the combination of a transversely-corrugated indentation-bed, a carriage adapted to travel over said bed, a plurality of style-operating finger-levers pivoted upon the carriage and each provided with a  
 35 recess, a plurality of styles arranged in alignment with the corrugations of said bed and each provided with a head movably fitting in the recess of its respective lever, and suitable means for imparting movement to said car-  
 40 riage.

2. A writing-machine comprising two banks of style-operating levers extending in opposite directions, the levers of each bank arranged parallel to one another, a traveling car-  
 45 riage carrying said levers.

3. In a writing-machine, a carriage, a toothed rack, a pair of shifting levers for the carriage, pawls carried by the levers and engaging in the teeth of the rack, a lever 41 con-  
 50 nected to the carriage, a lever 38 connected to said pair of levers, a spacing-lever 43, cross-bars attached to said levers 38, 41 and 43, and a plurality of style-operating levers pivoted upon the carriage.

55 4. In a writing-machine, a spacing mechanism comprising a rack-bar, a pair of levers pivotally connected together at their upper ends and at their lower ends provided with lugs adapted to engage the teeth of the rack, said  
 60 levers at their lower ends connected together by an expanding spring, and means for depressing the levers, causing their lower ends to spread apart.

5. In a writing-machine, the combination

with a traveling carriage, a plurality of styles 65 and a lever mechanism mounted upon the carriage for operating the styles, a variable stop mechanism, said mechanism consisting of a bar terminating at one end in a stop which extends toward the carriage, said bar further  
 70 provided with locking-notches and openings and studs extending through said openings, for supporting said bar.

6. In a writing-machine, the combination with a traveling carriage, a plurality of styles 75 and a lever mechanism mounted upon the carriage for operating the styles, a variable stop mechanism, said mechanism consisting of a bar terminating at one end in a stop which extends toward the carriage, said bar further  
 80 provided with locking-notches and openings and studs extending through said openings, for supporting said bar, a warning-bell, and a double striker therefor.

7. A writing-machine comprising two banks 85 of style-operating levers extending in opposite directions, and a traveling carriage carrying said banks of style-operating levers.

8. A writing-machine comprising two banks of style-operating levers extending in oppo- 90 site directions, the levers of each bank arranged parallel to and in close proximity to one another and of different length, and a traveling carriage carrying said banks of style-operating levers. 95

9. A writing-machine comprising two banks of longitudinally-extending style-operating levers, and a space-depressing lever extending in the same direction as the style-operating levers and arranged at one side of and below 100 said levers.

10. A writing-machine comprising two banks of style-operating levers extending in opposite directions, and a space-depressing lever arranged at one side of the said two banks 105 of style-operating levers.

11. A writing-machine comprising two banks of style-operating levers extending in opposite directions, the levers of each bank arranged parallel to and in close proximity to 110 one another, and a space-depressing lever arranged at one side of the said two banks of style-operating levers.

12. A writing-machine comprising a style-operating lever pivotally connected at one 115 end, and a style movably connected at its upper end in the said lever.

13. In a writing-machine for the blind, two banks of style-operating levers extending in opposite directions, a separate fulcrum means 120 extending through one end of the levers of each bank of levers, and a style for each of said levers of each bank of levers, said styles at their upper ends engaging in the said levers.

14. In a writing-machine, a rack-bar, a pair 125 of levers pivotally connected at their upper ends and at their lower ends provided with lugs adapted to engage the teeth of the rack,

said levers at their lower ends connected together by an expanding spring, means for depressing the levers causing their lower ends to spread apart, and finger-tips for said levers,  
5 said finger-tips adapted to permit of raising simultaneously the levers so as to lift the lugs clear of the teeth of the rack.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ALFRED WAYNE.

Witnesses:

C. HAYWARD POWELL,  
J. BERNARD HAYWARD.