

J. C. BARCLAY.
 PRINTING TELEGRAPH.
 APPLICATION FILED APR. 3, 1907.

936,849.

Patented Oct. 12, 1909.

8 SHEETS—SHEET 1.

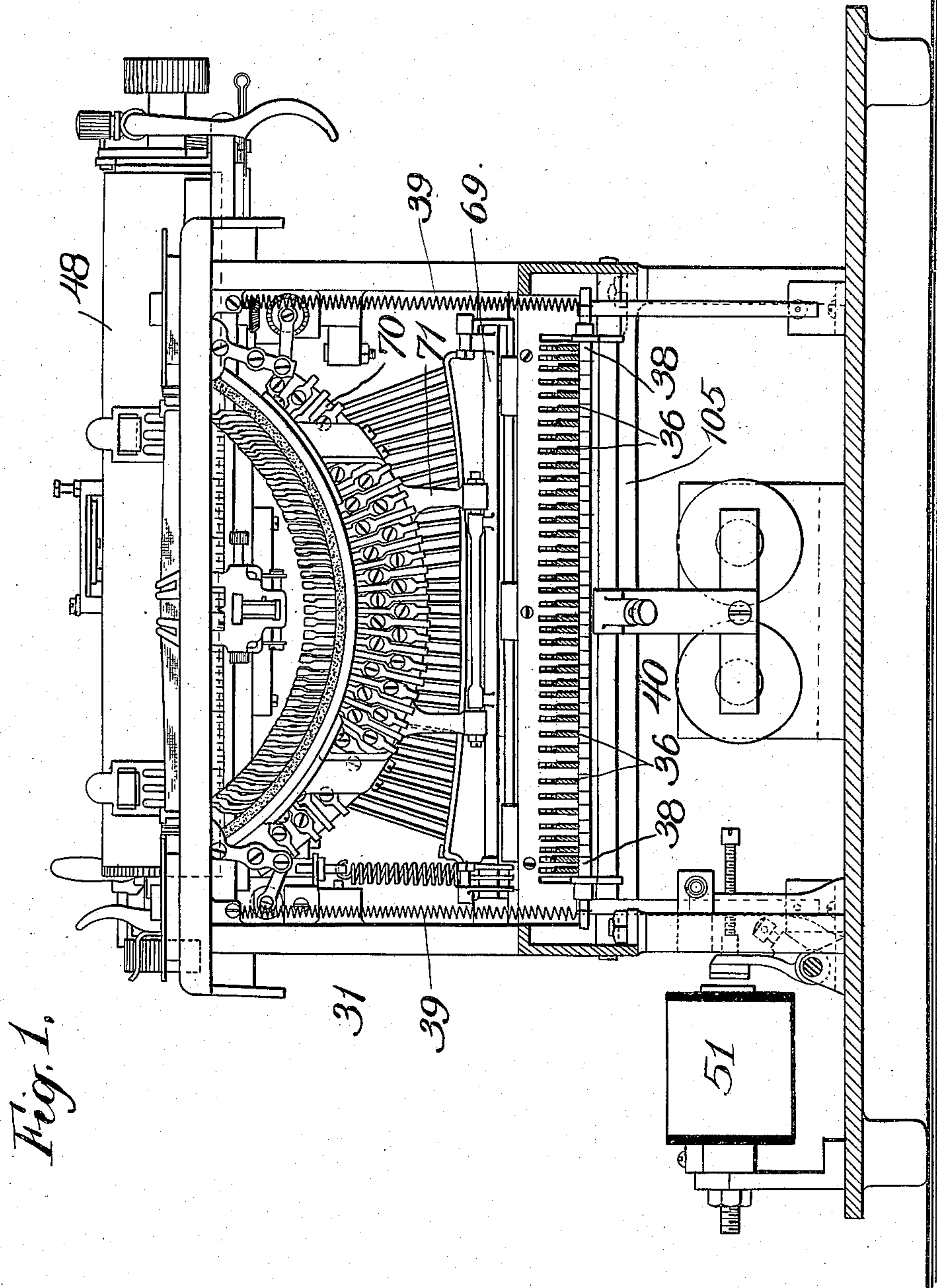


Fig. 1.

WITNESSES:

May J. Trimble
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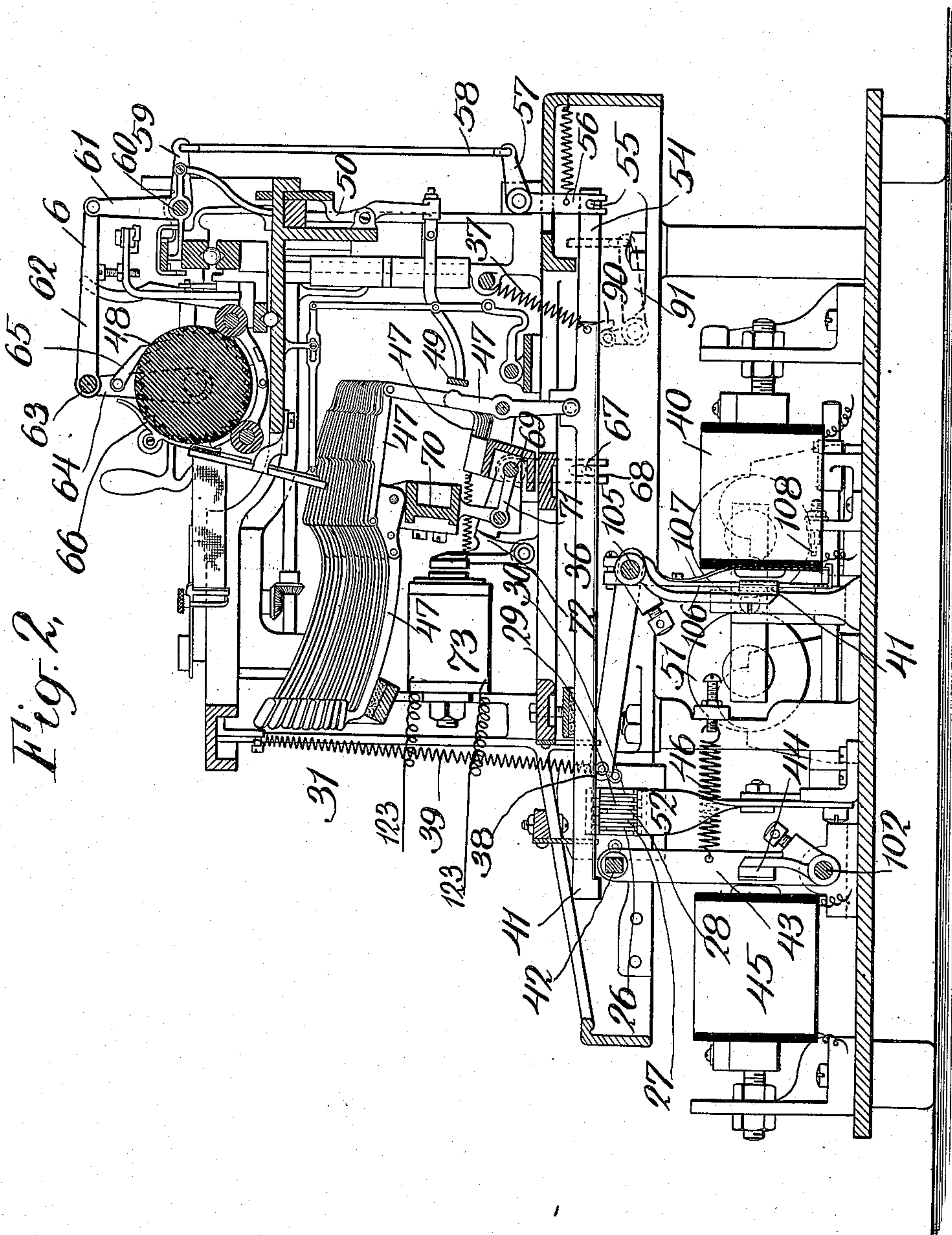
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8 SHEETS—SHEET 2.



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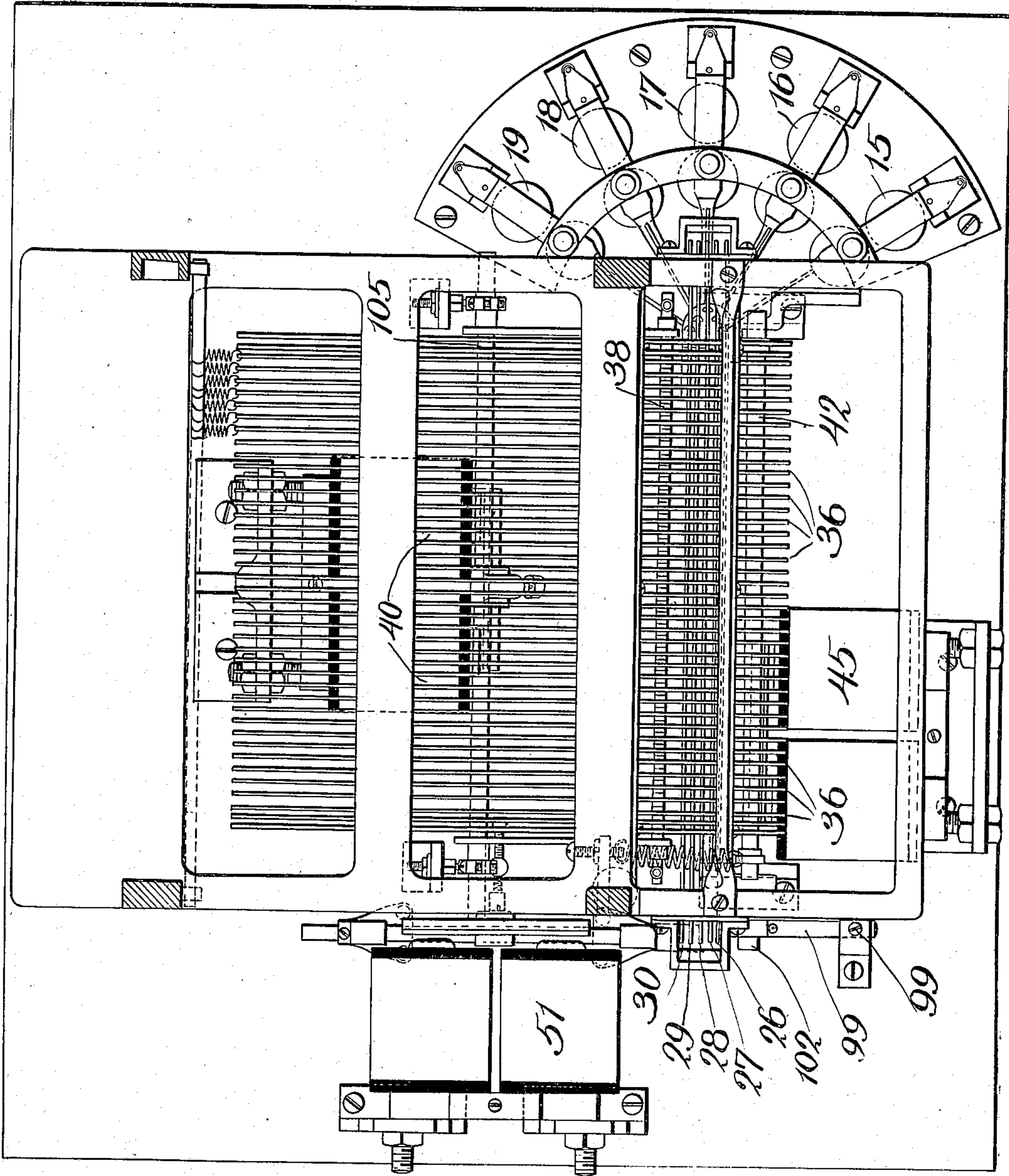
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8 SHEETS—SHEET 3.



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Fig. 3,

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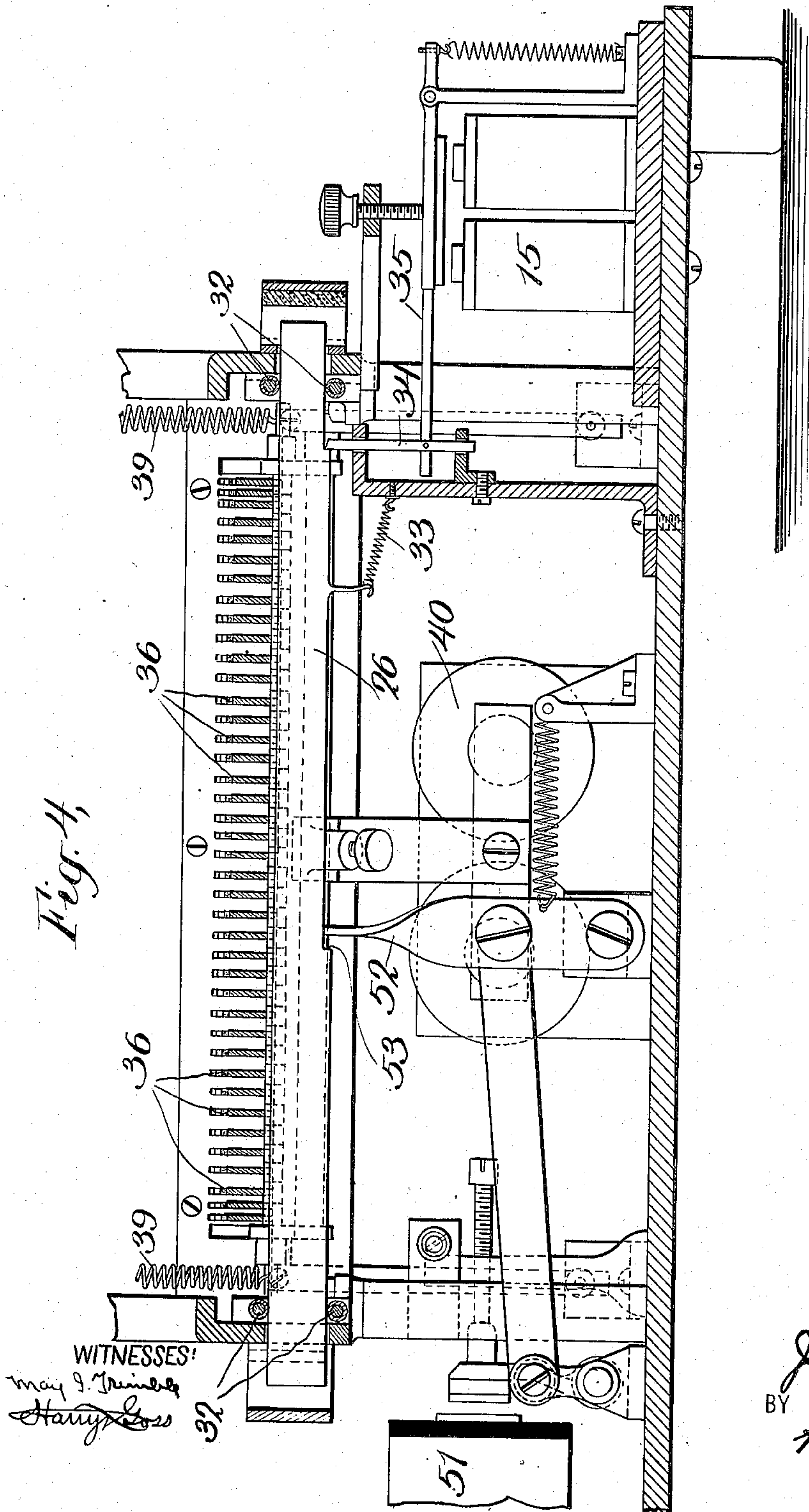
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8 SHEETS—SHEET 4.

Fig. 4,



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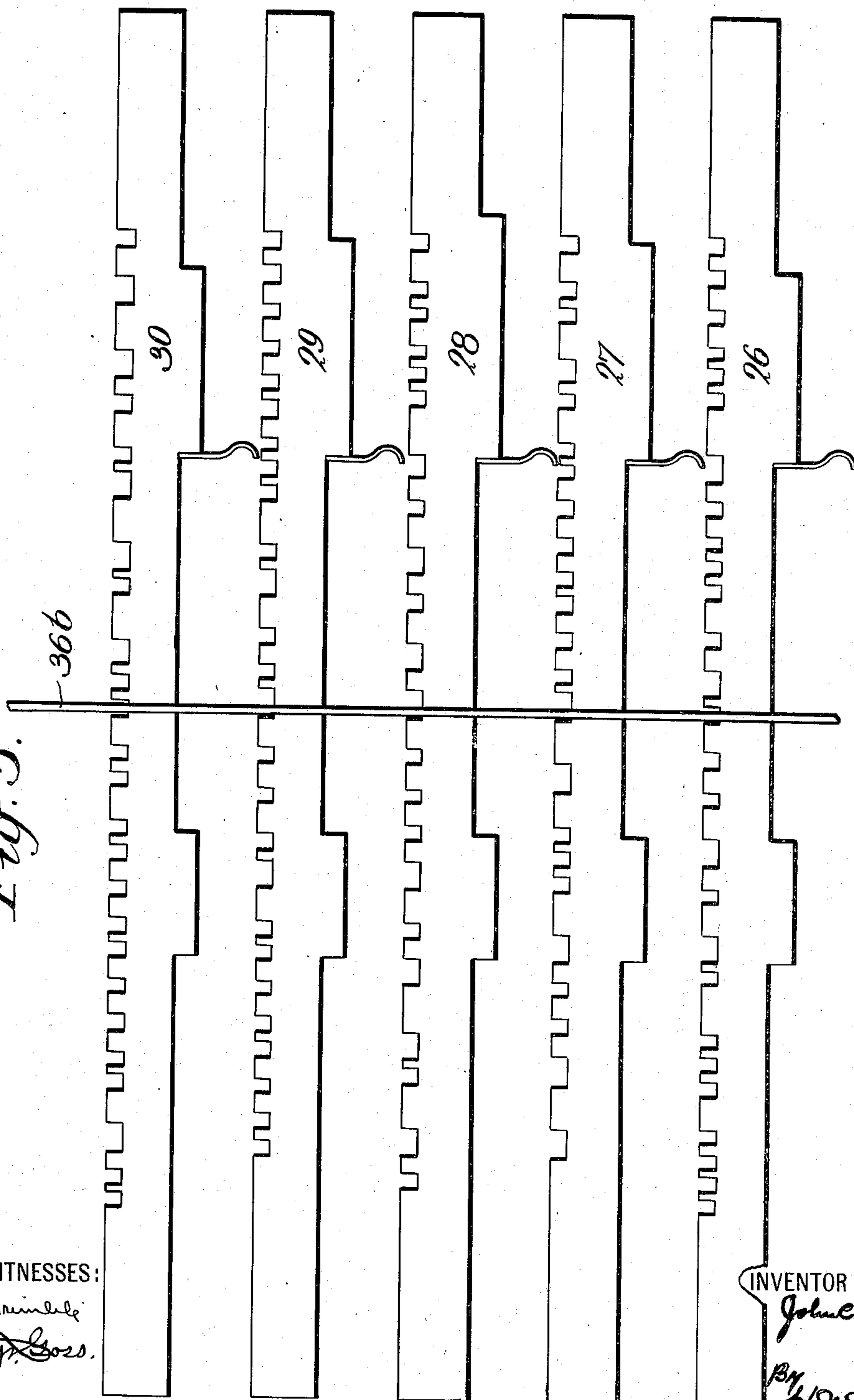
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PRINTING TELEGRAPH.
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8 SHEETS—SHEET 5.

Fig. 5.

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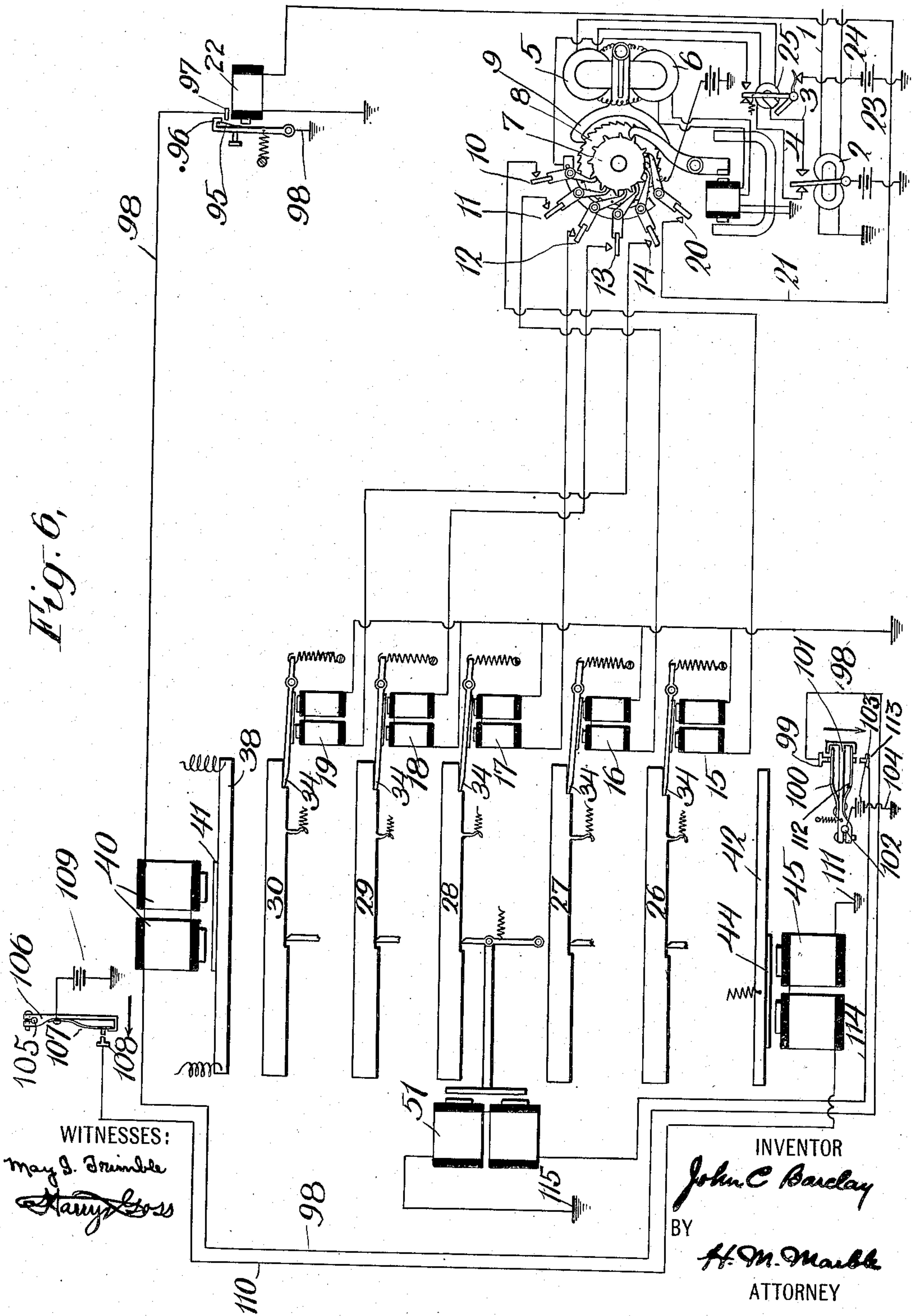
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PRINTING TELEGRAPH.
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8 SHEETS—SHEET 8.

Fig. 6,



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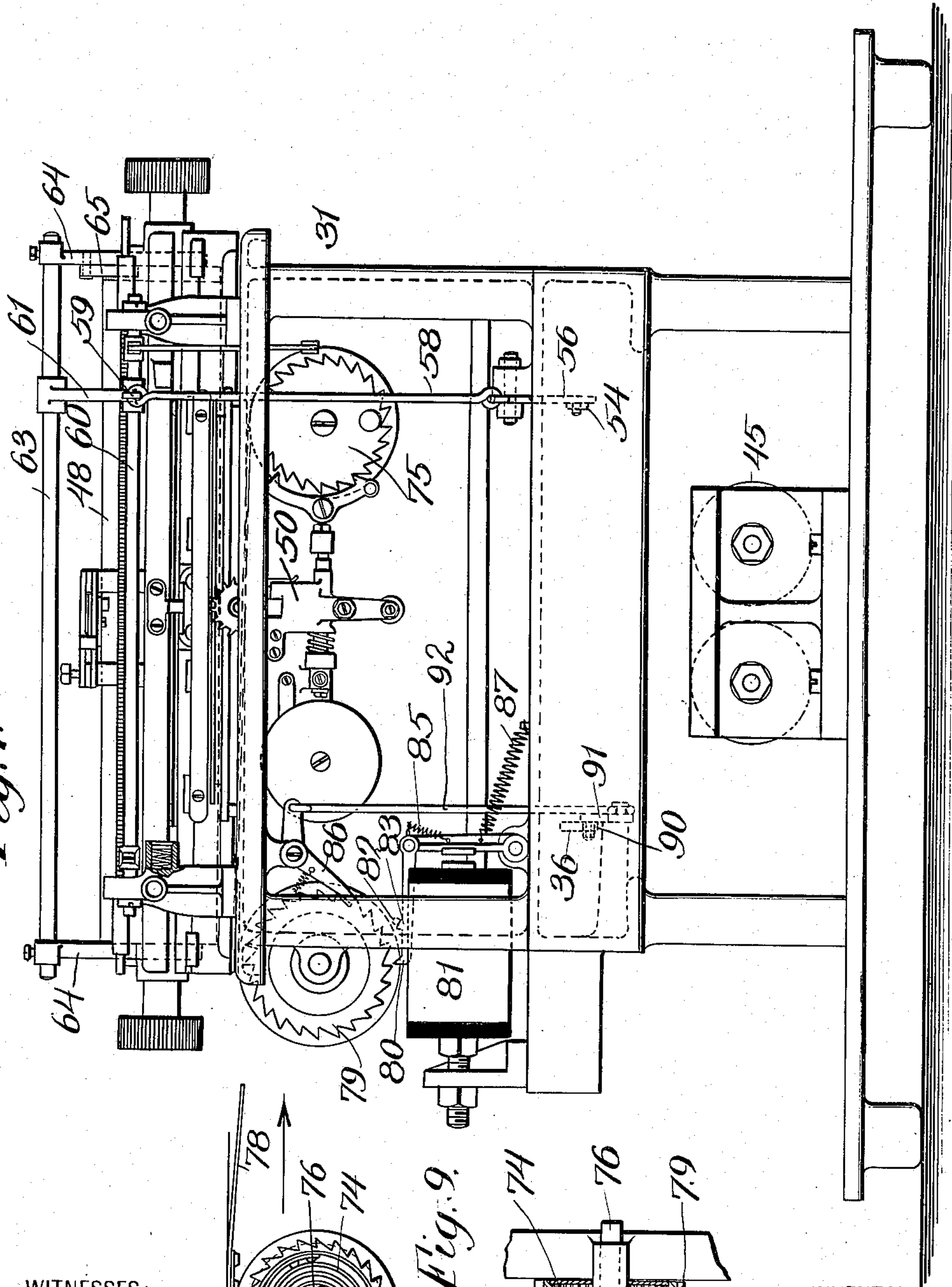
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8 SHEETS—SHEET 7.

Fig. 7.



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Fig. 8.

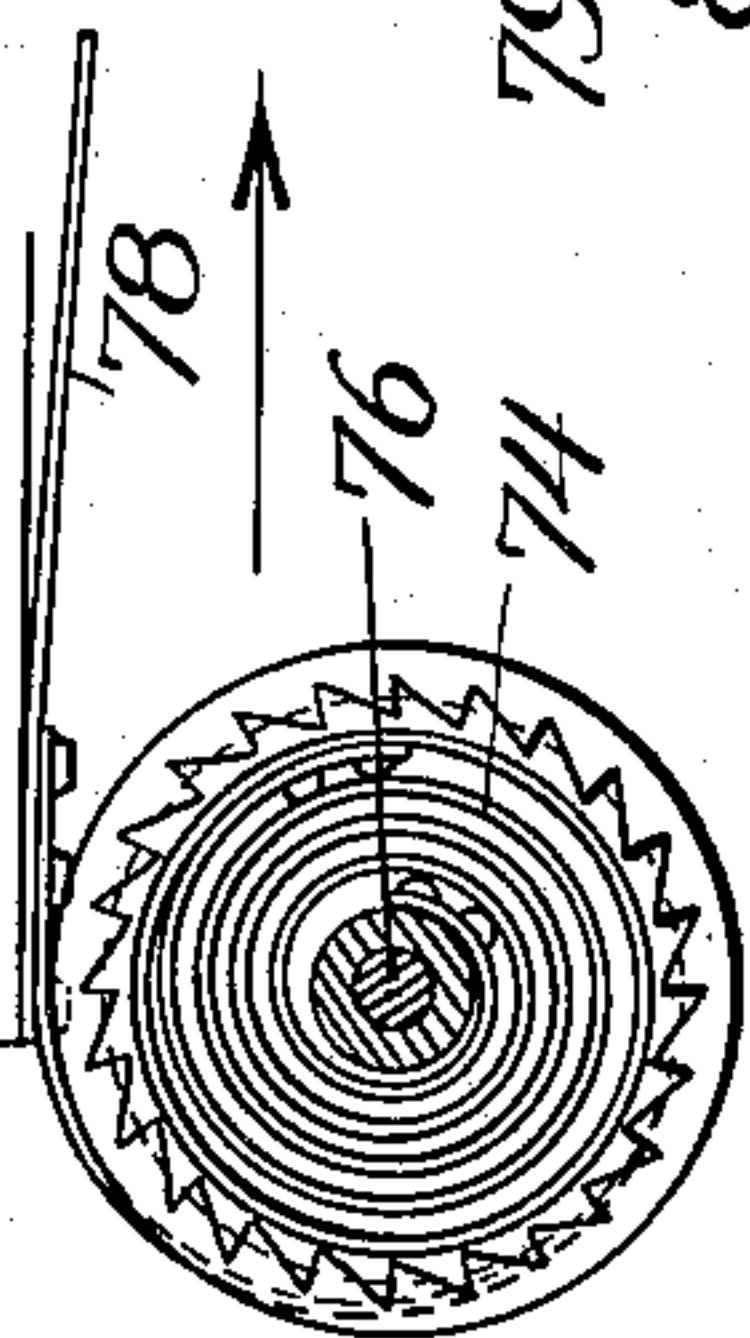
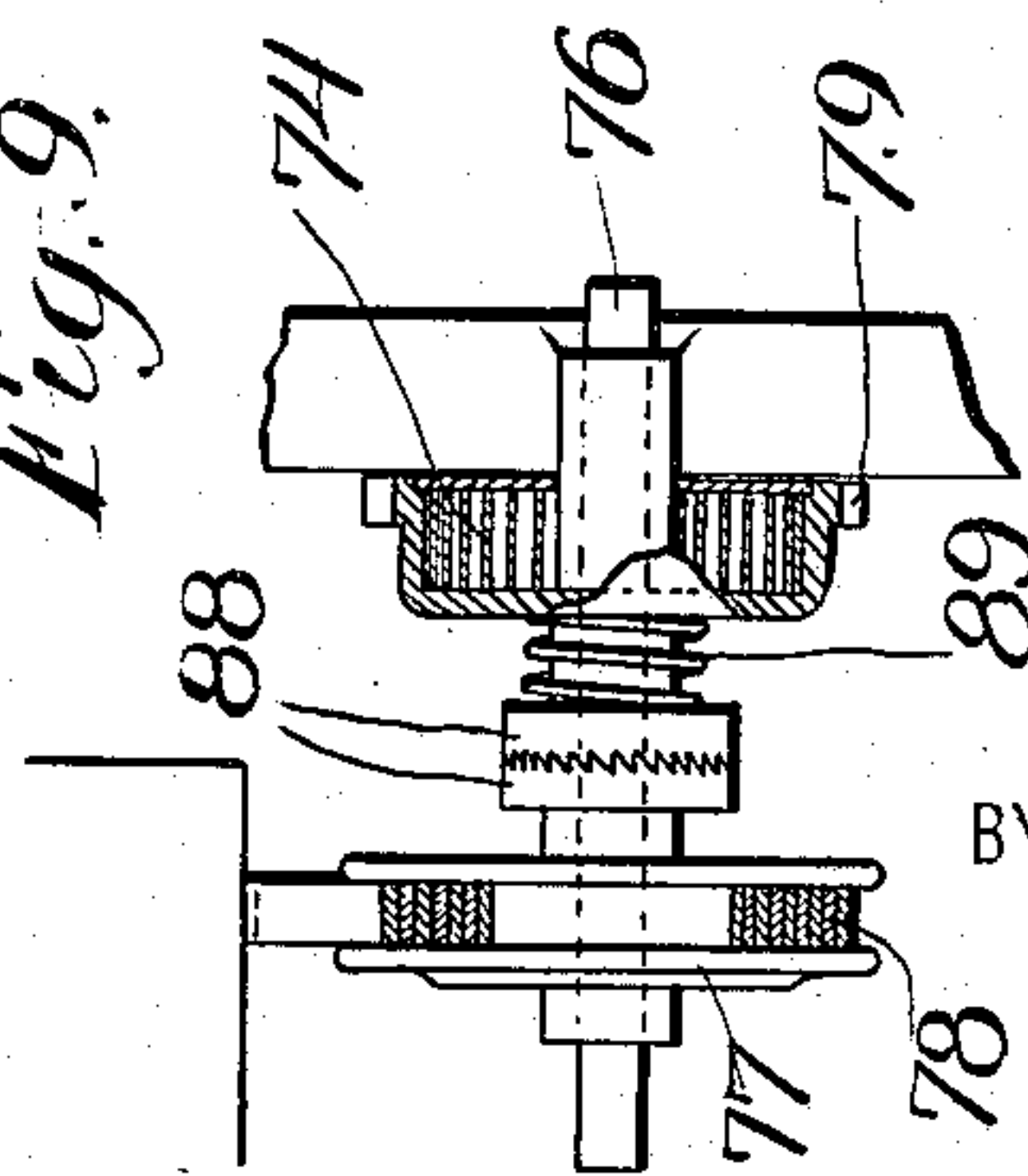


Fig. 9.



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 8 SHEETS—SHEET 8.

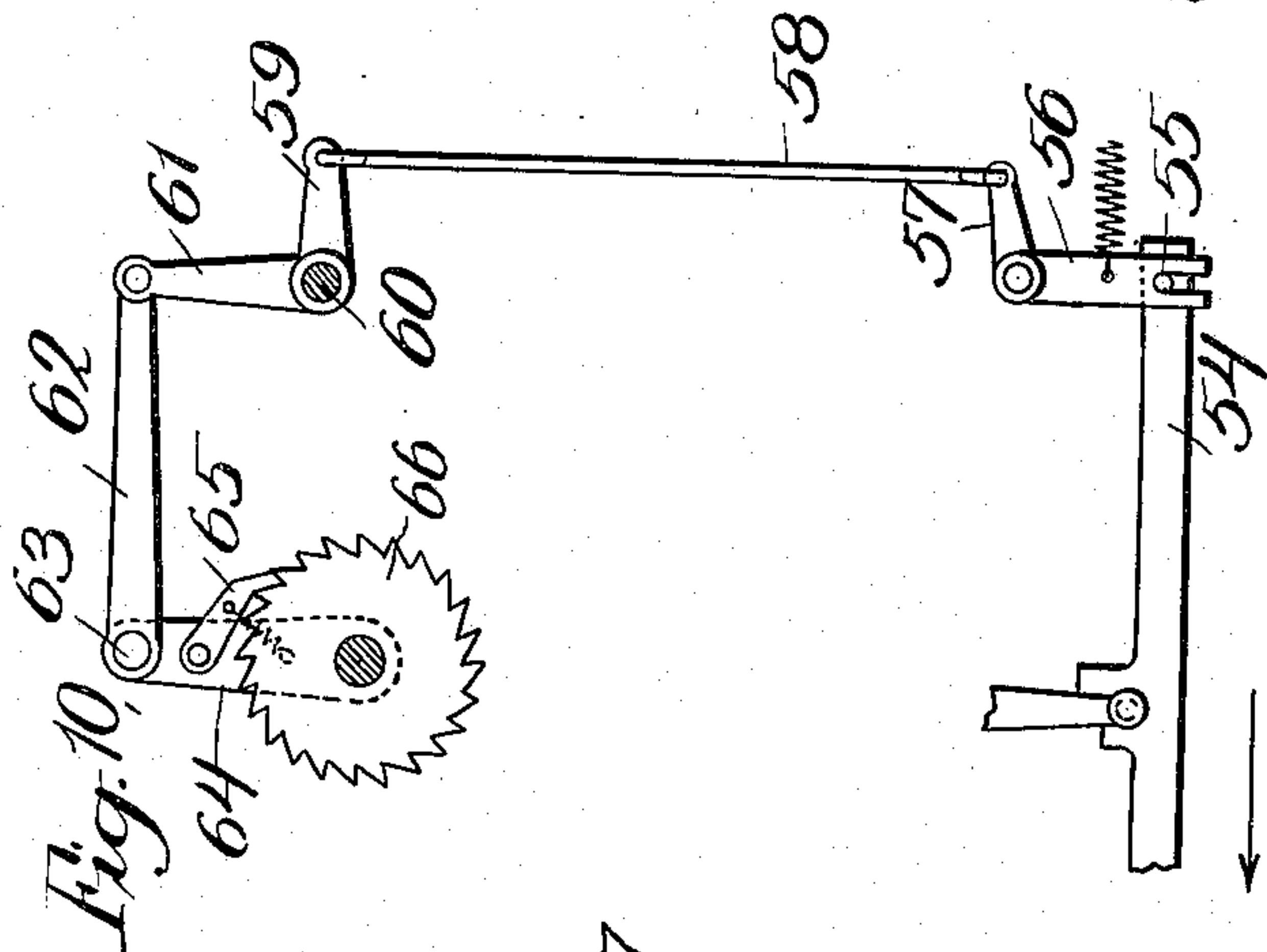
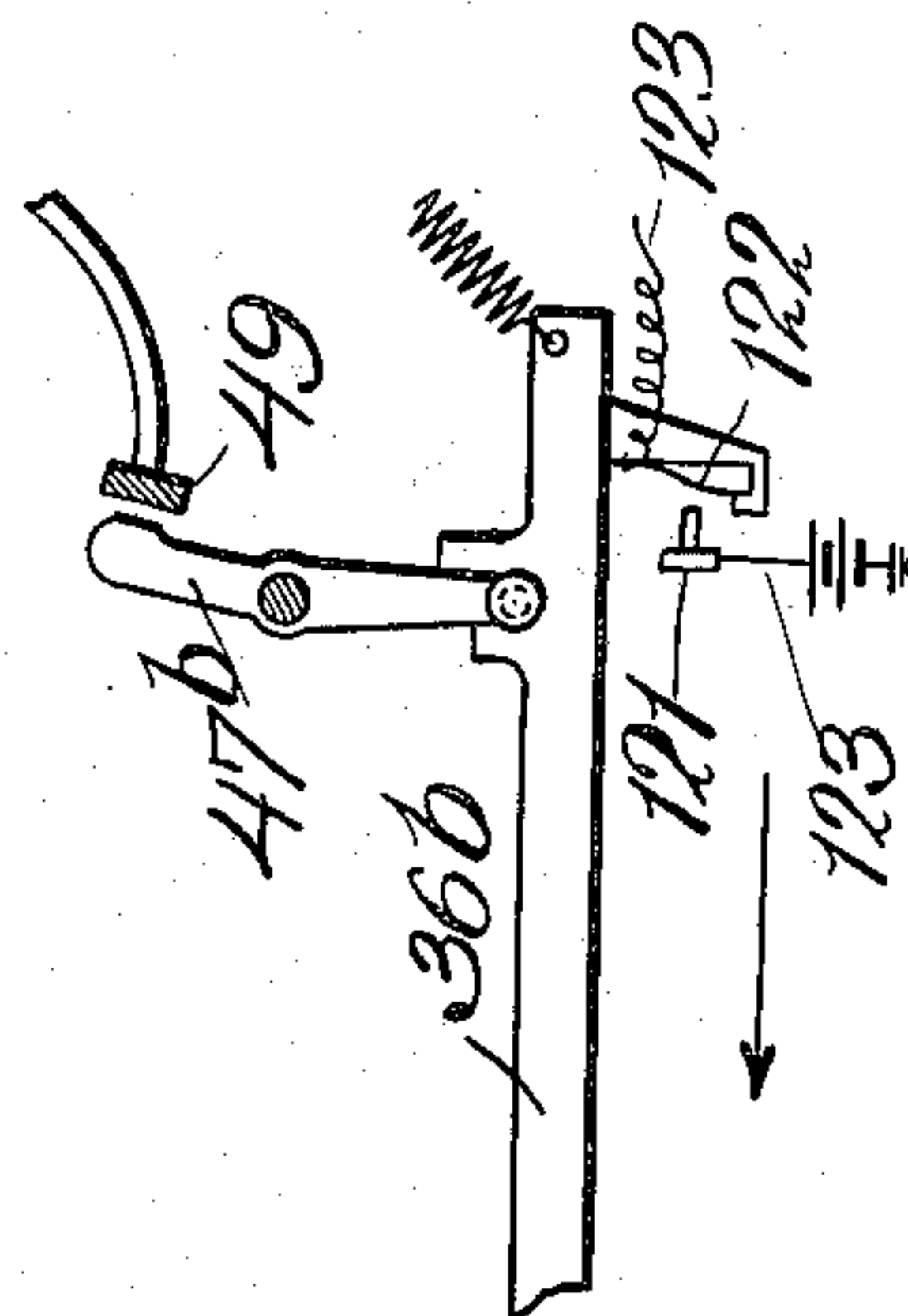
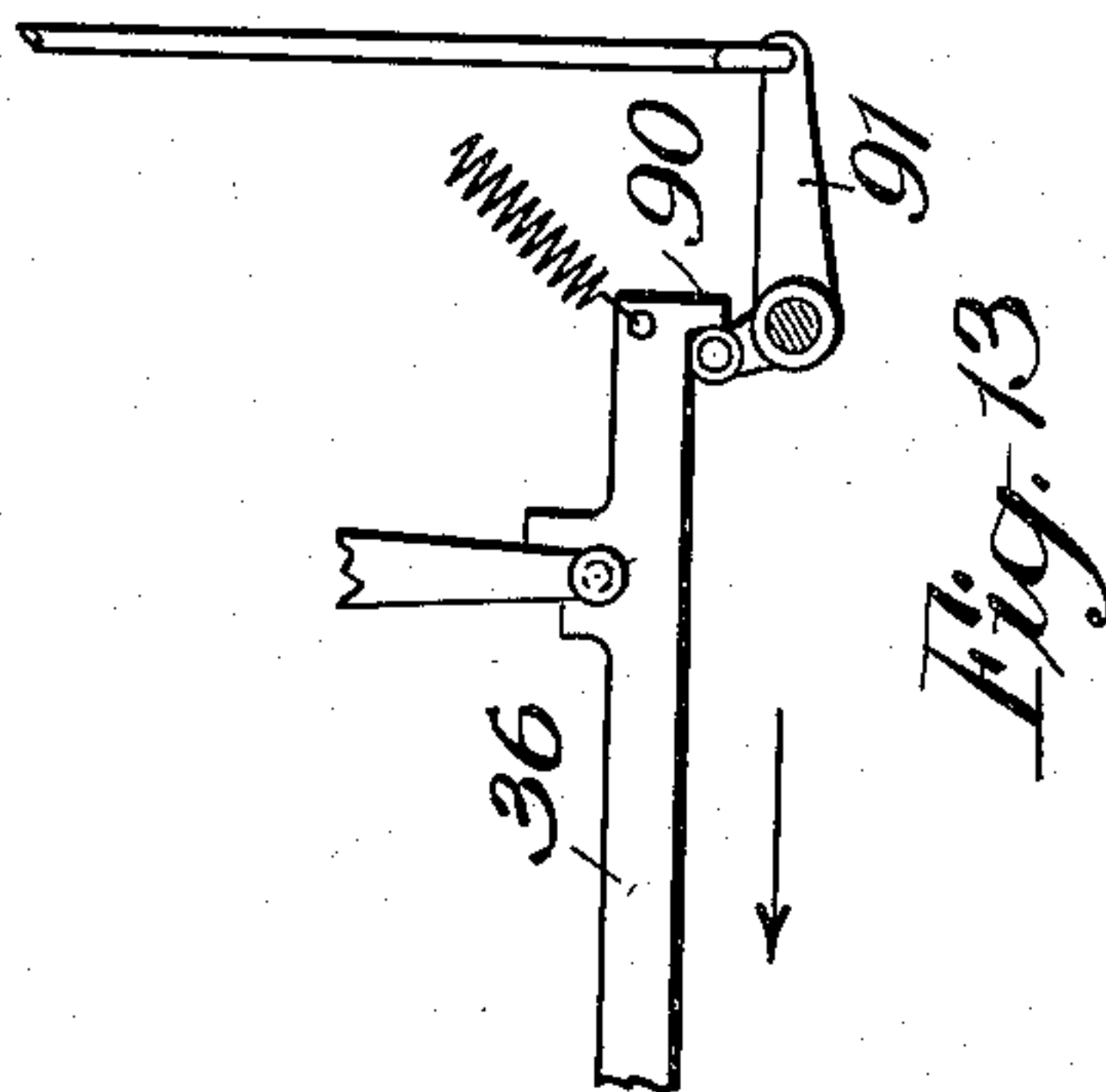
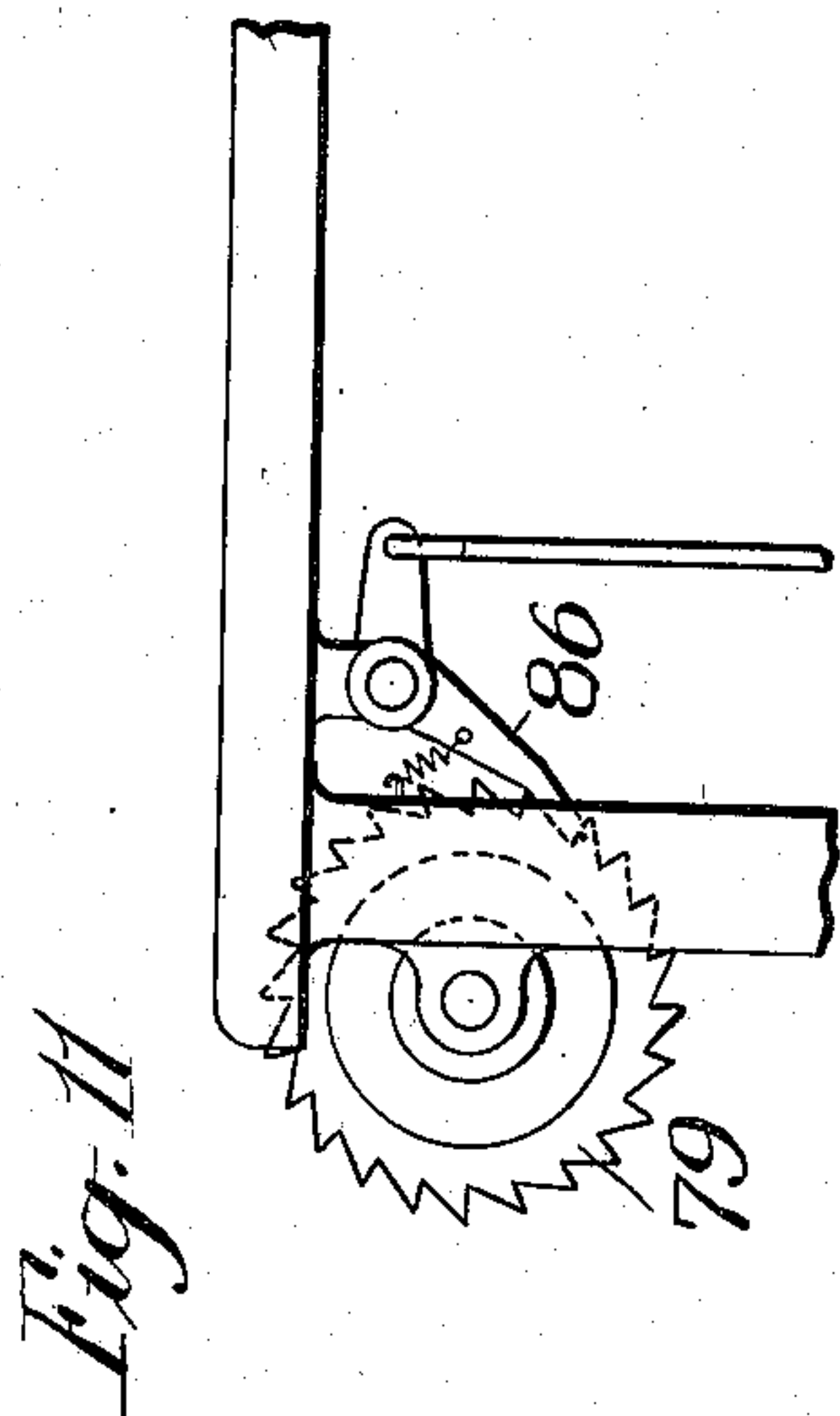
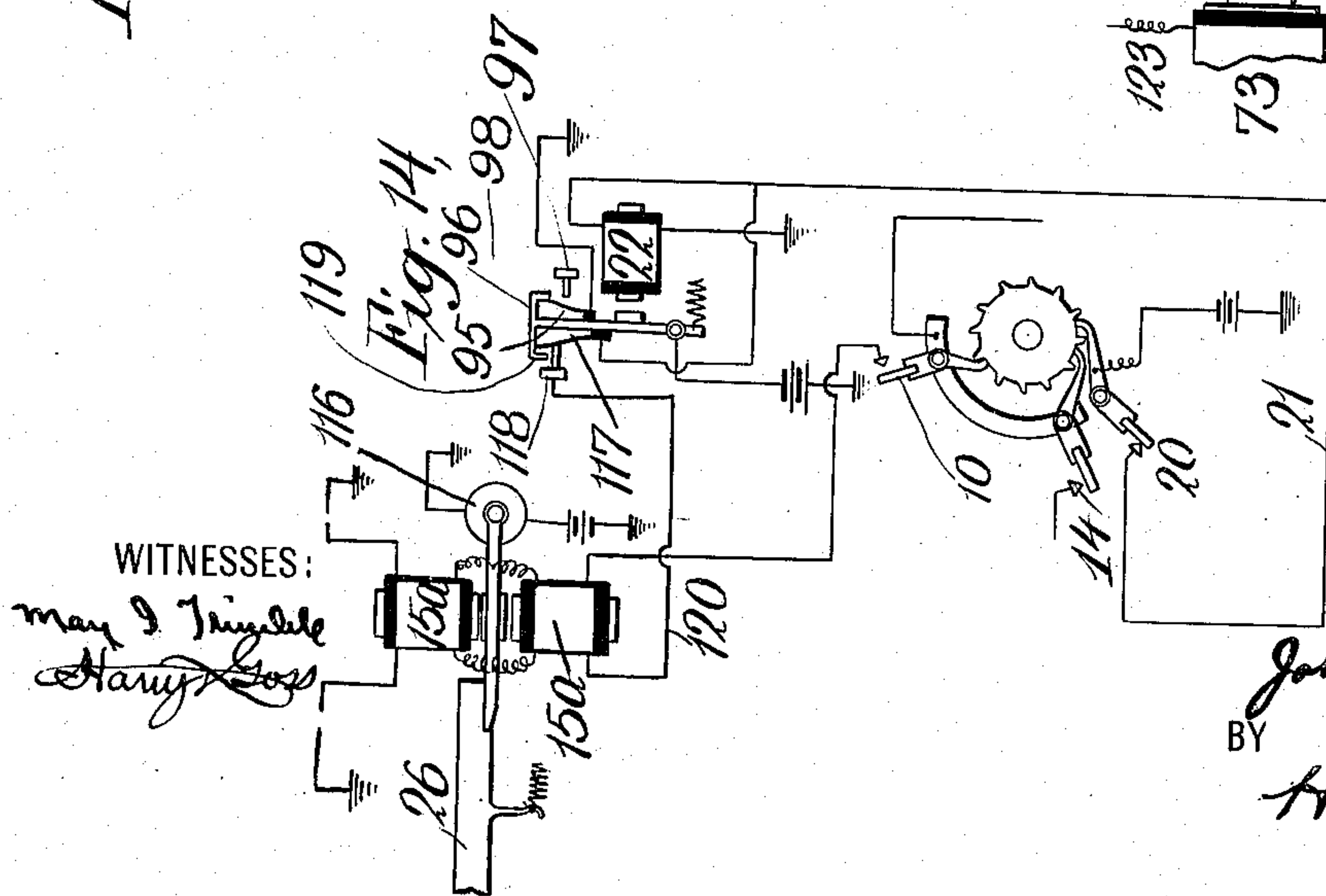
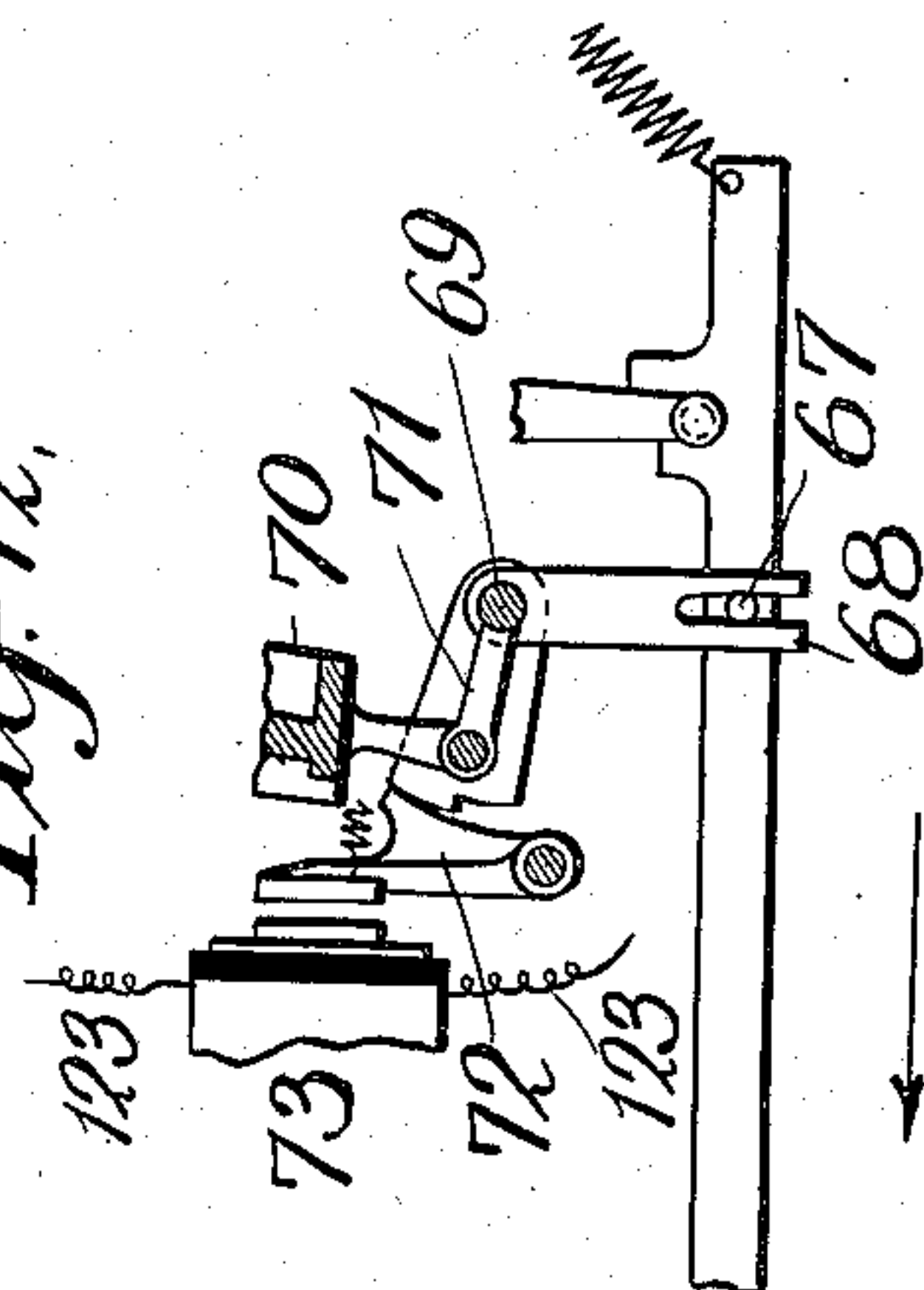


Fig. 12.



WITNESSES:

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UNITED STATES PATENT OFFICE.

JOHN C. BARCLAY, OF NEW YORK, N. Y.

PRINTING-TELEGRAPH.

936,849.

Specification of Letters Patent.

Patented Oct. 12, 1909.

Application filed April 3, 1907. Serial No. 366,119.

To all whom it may concern:

Be it known that I, JOHN C. BARCLAY, a citizen of the United States, residing in New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Printing-Telegraphs, of which the following is a specification.

My invention relates to printing telegraphs and particularly to the printing receiving instruments of such telegraphs, and consists in the novel selecting mechanism for automatically selecting the character to be printed; in the novel means controlled by such selecting mechanism for effecting the printing; and in various other features hereinafter more particularly described, and pointed out in the claims.

The objects of my invention are to improve and simplify printing telegraph receivers; to make the same more rapid in operation; to improve the selecting mechanism of such receivers, and reduce the time required for the operation of such selecting mechanism each time a character is to be printed; to provide simple direct-acting mechanism controlled by such selecting mechanism for effecting the printing; and generally to produce a simple, compact, reliable and direct-acting telegraph printer.

In various prior patents I have illustrated and described telegraph printers which are of the general nature of power-operated typewriters controlled by printing magnets corresponding to the different characters to be printed, and themselves controlled by electrical selecting mechanism. In the machine herein illustrated and described, much of the selecting mechanism is mechanical, its operation being effected by electro-magnets controlled by a sunflower and relays, themselves controlled by current pulses in a line circuit. The mechanical selecting mechanism has the advantage of being very simple and readily understood, of being readily corrected in case of possible derangement, of having no contact points requiring cleaning and inspection at intervals and which, by becoming dirty may prevent the selection of the desired signal, and of requiring a very small time interval for its operation.

I will now proceed to describe my invention with reference to the accompanying drawings in which one form of telegraph

printer embodying my said invention is illustrated, and will then point out the novel features in claims.

In the said drawings: Figure 1 shows a front elevation and partial section of a telegraph printer such as hereinbefore referred to, the same consisting of a typewriter controlled and arranged to be operated automatically by selecting mechanism as hereinafter described; Fig. 2 shows a vertical section from front to rear of the said printer; Fig. 3 shows a top view of the mechanical portion of the selecting mechanism and the bars for operating the type bars of the typewriter, the main portion of the typewriter being omitted from the view. Fig. 4 shows a detail front elevation of the said mechanical selecting mechanism. Fig. 5 is a diagrammatic view of this mechanical selecting mechanism, showing the notched selecting bars in side elevation but otherwise in normal relative position, with a single character bar indicated. Fig. 6 is an electrical diagram, showing the electrical selecting mechanism by which these selecting bars are controlled and operated, and showing also certain other parts of the apparatus. Fig. 7 shows a rear elevation of the machine, and illustrates particularly mechanism for returning the carriage. Fig. 8 shows a vertical transverse section and Fig. 9 a longitudinal section through the spring carriage-return mechanism. Figs. 10, 11, 12 and 13 are detail views respectively of the principal portions of the paper feed mechanism, release mechanism for the spring-operated carriage-return mechanism, type-shift mechanism, and spacing mechanism. Fig. 14 is a fragmentary diagram, showing the use, in the arrangement of circuits shown in Fig. 6, of polarized armatures and corresponding magnets for the detents.

In the printing telegraph system in which this printer is particularly intended to be used and for which the selecting mechanism is shown as adapted, each character signal consists of a fixed number of pulses, said pulses usually (and preferably) of alternately opposite direction, the variations necessary to distinguish the signal of one character from the signal of each of the other characters, being obtained by making certain of the pulses longer than others. These pulses, in line circuit 1 (Fig. 6), ac-

5 tuate a main line relay 2, which relay in
 turn controls local circuits 3 and 4 of op-
 posed magnets 5 and 6 controlling a sun-
 flower 7, which usually is driven positively,
 10 and is controlled by an escapement wheel 8
 and escapement anchor 9 operated by said
 magnets 5 and 6. Such mechanisms are well
 known. The sunflower has contact points
 corresponding in number to the number of
 15 pulses of the telegraphic characters (6 in the
 instance assumed) and all but the last of
 these contacts, that is to say, contacts 10, 11,
 12, 13 and 14, control circuits passing
 through corresponding magnets 15, 16, 17,
 20 18, and 19 respectively, which I will term
 hereafter the selecting magnets. The sixth
 sunflower contact 20, controls a circuit 21
 and relay 22, and, through said relay, an-
 other circuit and certain of the magnets here-
 25 inafter mentioned. A single battery or
 source of electrical energy 23 supplies cur-
 rent to the five local circuits of the first five
 sunflower contact points 10-14 inclusive,
 the battery lead 24 being controlled by a
 30 sluggish relay 25, termed the separator relay,
 itself controlled by the local circuits 3 and 4.
 This relay is so adjusted as to speed of
 operation, that if the line pulse operating
 relay 2 be a short pulse, said separator relay
 35 25 will not close the circuit of the battery
 23, and hence the closing of the correspond-
 ing sunflower contact will have no effect;
 but if, to the contrary, the line pulse operat-
 ing relay 2 be a long pulse, the separator
 40 relay will close such battery circuit, and
 hence the selecting magnet controlled by the
 particular sunflower contact completed at
 that instant will be energized.

40 The mechanical selecting mechanism com-
 prises five selecting bars 26, 27, 28, 29, and
 30 respectively, each corresponding to and
 arranged to be operated through the agency
 of one of the five selecting magnets 15, 16,
 17, 18, and 19, above mentioned. These se-
 45 lecting bars 26-30 inclusive, are arranged
 transversely of the base of what is in sub-
 stance an ordinary typewriter 31, beneath
 where the keyboard of such a typewriter is
 ordinarily located; such keyboard being
 50 omissible, and being in this case omitted.
 In Fig. 4 the mounting of one of these bars,
 26, is shown, and as clearly appears in said
 figure, said bars are mounted to move lat-
 erally or transversely of the machine, being
 55 carried by the guide rollers 32, and provided
 with springs 33 tending to so move them;
 said bars being normally held against such
 movement by detents 34 controlled by the
 armatures 35 of the various selecting mag-
 60 nets 15, 16, 17, 18 and 19. When one of said
 magnets is energized it pulls down the cor-
 responding detent 34, permitting the cor-
 responding selecting bar to move to the right
 of Fig. 4. These selecting bars are toothed
 65 irregularly on their upper surfaces in such

manner that particular combinations of
 teeth and intermediate notches can be pro-
 duced, by the lateral movement of one or
 more of said selecting bars, so as to permit
 the selecting and dropping down of any de-
 70 sired one of a series of character bars 36 ar-
 ranged horizontally above the selecting bars
 26-30 inclusive and transversely thereof, and
 arranged longitudinally with respect to the
 machine. These character bars 36 corre-
 75 spond generally to the key levers of a type-
 writer and there is a separate bar for each
 of the various type bars of the machine.
 Said character bars are mounted to slide for-
 ward and back, are provided at their rear
 80 ends with individual springs 37, are pivoted
 to the corresponding type-bar actions 47,
 (hereinafter mentioned) and normally are
 supported near their front ends by a uni-
 versal bar 38 itself suspended by springs 39,
 85 their weight being thereby taken off the se-
 lecting bars 26-30 inclusive. A drop mag-
 net, 40, when attracted toward its magnet,
 moves down the universal bar 38 against the
 tension of said springs 39, thereby permit-
 90 ting character bars 36 to drop upon selecting
 bars 26-30 inclusive; but all but one of said
 character bars will be arrested by a tooth of
 one or more of the bars 26-30. However,
 some one of the said bars 36, for each permu-
 95 tational adjustment of the selecting bars
 26-30, will not be arrested by any tooth of
 any of said bars, but will be permitted to
 drop still farther, its hooked front end 41
 in position to engage a transverse driver 42
 100 mounted upon arms 43 and arranged to be
 moved forward by the armature 44 of the
 printing magnet 45 against the tension of a
 retractile spring 46.

The several character bars 36 are each con-
 105 nected to a corresponding type-bar action 47,
 so that each bar 36, when pulled forward
 by the driver 42, actuates its corresponding
 type bar action, causing the type bar to
 strike toward and against the typewriter
 110 platen 48. I do not limit myself to any par-
 ticular type of type-bar action. That indi-
 cated in the drawings is the action of one
 well known typewriter. The type bar ac-
 115 tions are, in fact, actuated by the bars 36
 substantially the same as they would be actu-
 ated by the finger keys and key levers of the
 ordinary typewriter mechanism.

By means hereinafter described, printing
 magnet 45 is deenergized before or just as
 120 the selected type bar strikes the platen 48
 or the typewriter ribbon and paper on the
 platen, so that the type bar returns instantly
 to its normal position, under the influence of
 gravity and of its return spring such as is
 125 customarily provided in such typewriter
 actions. The exact moment of deenergiza-
 tion of magnet 45 is regulated so as to secure
 the desired strength of blow without inter-
 130 fering with the rebounding return desirable

in such actions. The several typebar actions 47, when so actuated, actuate a universal bar 49, connected to and arranged to actuate the usual feed-escapement mechanism 50 (Figs. 2 and 7) of the machine. I do not illustrate these and like customary parts in detail, as the same are well known in many different forms and are in common use, and my invention is in no way confined to the use of any particular typewriter action, escapement mechanism, etc.; but any suitable typewriter action, escapement mechanism, etc., may be used. Magnet 40 is deenergized at about the same time as magnet 45, and the springs 39 then lift that bar 36 which engages notches of the selecting bars 26-30, and all the other actuating or character bars, clear of said selecting bars 26-30. A restoring magnet 51, then actuated, operates a restoring bar 52 adapted to engage a shoulder 53 on the lower edge of the selecting bar or bars of series 26-30 which were previously moved to the right, thereby moving such bars to the left, where they are held by their detents 34, that magnet or magnets of series 15-20 which previously released such detents having already been deenergized, as hereinafter described.

Line spacing, shifting to upper case, and carriage return are all determined, in the apparatus shown, by operating proper ones of the selecting bars 26-30. For line spacing, one of the character bars 36 is provided with a rearward extension 54 (Fig. 2) provided with a pin 55 engaging an arm 56 of a bell-crank, the other arm 57 of which is connected by a link 58 to one arm 59 of a bell-crank pivoted on a rod 60, the other arm 61 of said latter bell-crank being connected by a link 62 to a rod 63 mounted on arms 64 pivoted to the axis of the platen 48, the said link 62 having a loose bearing on the rod 63 so that the latter may slip readily there-through as the carriage moves; while at the same time downward movement of link 58 is communicated to said rod 63 and so to the arms 64. One of these arms carries a pawl 65 engaging the usual line-spacing ratchet 66 (indicated in dotted lines in Fig. 2) so that as the arms 64 are drawn backward the platen is rotated. This will occur, obviously, when that character bar 36 which is provided with the rearward extension 54 is selected through the operation of the proper ones of the selecting bars 26-30 and drops down into engagement with reciprocating bar 42 and is moved forward thereby. For shifting to upper case, another of the character bars 36 is provided with a pin 67 (Fig. 2) engaging an arm 68 on a rock-shaft 69. A sector 70 upon which the various type bars 47 are pivoted is supported on a bracket 71 carried by this rock-shaft 69; and when the bar 36 which so engages arm 68 is permitted by the selecting bars to drop

down into engagement with reciprocating bar 42 and is drawn forward by said bar, sector 70 is raised to the upper case position. Once raised to such position it is held there by a spring-actuated catch 72. To release said trip, when desired to return to lower case, I provide a magnet 73 of which the catch 72 forms an armature, said magnet being arranged to be energized as hereinafter described to release the catch and permit the sector 70 to drop to lower case position.

For returning the carriage I provide a returning spring 74 (Figs. 8 and 9) stronger than the spring of the customary carriage-feeding mechanism 75 (Fig. 7), but not normally in driving or winding connection with the carriage. I do not in the drawings show the details of the ordinary carriage feed mechanism 75, but merely show that part thereof, (the tension-adjusting ratchet) which is the only part of such mechanism customarily seen clearly from the rear of the machine; and from this it will be understood that such carriage-feeding mechanism is the ordinary spring feeding mechanism commonly used on typewriters. Carriage return spring 74 is anchored at its inner end, and is mounted about a shaft 76, upon which shaft is mounted loosely, a drum 77 carrying a flexible tape 78 connected to the carriage. As the carriage moves from right to left (as viewed from the front of the machine) during the normal printing of a line, this tape 78 will be gradually unrolled. A ratchet wheel 79, also mounted on this shaft 76, and to which the outer end of the spring is connected, is advanced step by step, each time the carriage moves a space from right to left (as viewed from the front of the machine) by a pawl 80 operated by a magnet 81 energized each time a character is printed or the carriage is otherwise caused to advance a space, all as hereinafter described. This pawl 80 is normally held out of engagement with the ratchet wheel 79 by a pin 82 engaging a cam portion 83 of the pawl; this being done for a reason hereafter explained. When magnet 81 is energized and caused to draw its pawl 80 forward said pawl is raised by its spring 85 into engagement with the ratchet wheel 79, and then advances the ratchet wheel through the space of one tooth. A holding pawl 86 normally holds the ratchet wheel 79 against backward movement. When magnet 81 is deenergized again pawl 80 is drawn back by retractile spring 87 and is moved out of engagement with the ratchet teeth by pin 82 engaging cam portion 83. A ratchet clutch 88 (Fig. 9) connects ratchet wheel 79 and drum 77, but the teeth of this ratchet clutch are so set that as the wheel 79 is rotated step by step in this manner to wind up spring 74, the members of the clutch 88 slip relatively,

this being permitted by the clutch spring 89. To return the carriage, one of the bars 36 is provided with a lug 90 (Fig. 2) adapted, when pulled forward, to operate a bell-crank lever 91 connected by a link 92 to pawl 86. When that bar 36 which is provided with said lug 90 is selected by the operation of the appropriate selecting bars and is therefore drawn forward by bar 42, it causes withdrawal of pawl 86 and permits spring 74 to rotate the ratchet wheel 79 backward and with it the drum 77, so drawing the carriage backward against the tension of its spring carriage-feed mechanism 75.

Referring now to the diagram, Fig. 6, the circuits by which the drop magnet, printing magnet, and restoring magnet are operated, will now be explained. The circuits by which the five selecting magnets 15-19 inclusive are operated, have already been described and need no further description.

The sixth sunflower contact 20 of the sunflower 7 controls a local circuit 21 passing through the magnet of a relay 22. The armature of this relay has a spring contact tongue 95 and a hook 96 for drawing said tongue away from the contact stop 97 when the armature is retracted. When contact spring 95 and contact tongue 97 are in contact, a circuit 98 is completed through the armature of said relay, spring 95, stop 97 and drop magnet 40 to back contact stop 99 of a contact spring 100 mounted upon a T-headed arm 101 on the pivot axis 102 (Figs. 2 and 3) of the armature 44 of printing magnet 45. Contact is normally closed between contact stop 99 and contact spring 100 so that when circuit 98 is completed by relay 22, as above described, said circuit passes through arm 101 and battery 103 to ground at 104. Drop magnet 40 being thus energized and caused to attract this armature, the lifting bar 38 is pulled down, allowing the character bars 36 to drop on to the selecting bars 26-30, and allowing the selected one of said character bars to drop farther into engagement with reciprocating driving bar 42 operated by the printing magnet 45. Upon the pivotal axis 105 (Figs. 2 and 3) of the armature of drop magnet 40, is mounted a contact arm 106 (Figs. 2 and 6) having a hook end and carrying a contact spring 107 adapted to make contact with a stop 108 (Figs. 2 and 6), when the armature of said drop magnet 40 is so attracted. This contact thus closed completes a circuit from battery 109 through contact arm 106, spring 107, and stop 108 through conductor 110 and printing magnet 45 to ground at 111, and thence back to battery. The printing magnet being thus energized pulls forward the reciprocating driving bar 42, thus actuating the selected character bar 36. Contact arm 101 being thus moved, the circuit 98 is broken at the proper time, thus breaking the

circuit of drop magnet 40, whereupon all of the character bars 36, including that selected bar which has just been operated by driver 42, are raised by bar 38 and its springs 39. Immediately thereafter another contact spring 112 on arm 101 closes circuit from battery 103 through contact stop 113 and a conductor 114 to restoring magnet 51 and thence to ground at 115, thereby restoring all of the selecting bars 26-30 which have been actuated to normal position. The various selecting magnets 15-19, having already been deenergized through the breaking of the corresponding sunflower contacts, the detents controlled by said magnets engage the corresponding selecting bars when so restored to normal position. Upon the beginning of the next character in the line circuit 1, and the consequent beginning of another cycle of operation of the sunflower, the sixth contact 20 is broken, thus deenergizing relay 22. When the drop magnet is deenergized by the breaking of circuit 98 at contact point 99, circuit 110 is broken at contact stop 108, thereby breaking the circuit of the printing magnet 45, whereupon driver 42 returns to its original position; and as this occurs the circuit of restoring magnet 51 is broken at contact stop 113. The parts are then back to their normal positions. Spring contacts are provided in relay 22 and on contact arms 106 and 101, so that there may be regulation of the time during which magnets remain energized, to permit rapid operation. For example, supposing that a second character succeeds the first closely in circuit 1, so that the sixth sunflower contact 20 is broken almost instantly after it is made, it is quite important that circuit 98 shall not be broken by relay 22 until after driver 42 has been moved to the full extent of its travel by magnet 45. The spring contact tongue 95 assures this, since circuit 98 will not be broken by relay 22 until the armature of said relay has nearly returned to its back stop. Similarly circuit 110 will not be broken by contact tongue 107 until arm 106 has nearly returned to its rearmost position, and similarly the contact springs 100 and 112 permit regulation of the time of breaking of circuits 98 and 114 by the operation of arm 101.

For simplicity I have shown the various detents of the selecting bars operated by electro-magnetic means corresponding to neutral relays. In practice, however, I prefer to operate said detents by electro-magnetic means corresponding to polar relays, and have illustrated this in Fig. 14. In this figure I have shown one selecting bar, 26, and one detent magnet therefor, 15^a, said magnet arranged with opposite poles on opposite sides of the detent armature, as is common in polar relays, said armature being polarized by a magnet 116. Relay 22 has, besides the con-

tacts 95 and 97 of circuit 98, a contact spring 117 normally in contact with a stop 118, but arranged to be separated therefrom by an armature hook 119 when the armature is attracted. Magnet 15^a has coils in a local circuit controlled by sunflower contact 10, as in Fig. 6, but has also opposing restoring coils in a circuit 120 passing through contacts 118 and 117 and through sixth-pulse sunflower contact 20. It will be seen that when the sixth-pulse contact 20 is first completed and relay 22 energized, circuit 120 is broken as circuit 98 is completed; and that when contact 20 is again broken and relay 22 deenergized, circuit 120 is closed as circuit 98 is broken at relay 22, said circuit 120 then acting to restore the armatures of magnet 15^a and the other similar detent magnets to normal position. It will be understood that the arrangement shown in Fig. 14 contemplates the same number of selecting bars and detent magnets as shown in Fig. 6, circuit 120 passing in series through all of them and thence to ground. But for convenience I have shown only one detent magnet in Fig. 14.

One of the character bars 36, designated as 36^b in Fig. 13, corresponds to the space-key of an ordinary typewriter, and is not connected to any type-bar action 47, but instead operates a pivoted lever 47^b adapted to engage the universal spacing-bar 49 in the same manner that the corresponding parts of the type-bar actions engage and operate said spacing-bar 49 to operate the escapement mechanism. This same character bar 36^b is used to effect the return of the basket or bank of type-bar actions from "upper case" position. To this end said bar 36^b, when drawn forward, operates a contact device 121—122, thereby closing a circuit 123 in which the release magnet 73 is included.

What I claim is:—

1. A printing telegraph comprising in combination a series of selector bars, selector magnets controlling the same, character bars controlled by said selector bars; drop mechanism comprising a drop magnet and means operated thereby controlling engagement of said character bars and selector bars; a printing magnet and means operated thereby for operating a selected character bar, and selecting means for said magnets comprising a sunflower and a separator relay and circuits controlling said selector magnets, drop magnet and printing magnet, means causing the drop magnet to operate in advance of the operation of the printing magnet, and means controlled directly by the sunflower causing the action of the drop magnet to be delayed.

2. A printing telegraph comprising in combination a series of selector bars, selector magnets controlling the same, character bars controlled by said selector bars, drop mechanism

comprising a drop magnet and means operated thereby controlling engagement of said character bars and selector bars, a printing magnet and means operated thereby for operating a selected character bar, and selecting means for said magnets comprising a sunflower and a separator relay, and circuits controlling said selector magnets, drop magnet and printing magnet, a relay controlled by one of said sunflower circuits, a circuit controlled by said relay and controlling the drop magnet, contact means operated by said drop magnet, and a circuit controlled thereby controlling the printing magnet, and contact means operated by the printing magnet and controlling the circuit which controls said drop magnet.

3. A printing telegraph comprising in combination a series of selector bars, selector magnets controlling the same, character bars controlled by said selector bars, drop mechanism comprising a drop magnet and means operated thereby controlling engagement of said character bars and selector bars, a printing magnet and means operated thereby for operating a selected character bar, and selecting means for said selector magnets comprising a sunflower and a separator relay, and circuits controlling said selector magnets, drop magnet and printing magnet, a relay controlled by one of said sunflower circuits and controlling the circuit of the drop magnet, contact means operated by said drop magnet and controlling the circuit of the printing magnet, and contact means operated by the printing magnet and controlling the circuit which controls said drop magnet, a restoring magnet and means operated thereby for restoring said selector bars, and a circuit for said restoring magnet likewise controlled by the contact device operated by said printing magnet.

4. A printing telegraph comprising in combination a series of selector bars, means tending normally to move same in one direction, detents normally preventing such movement, magnets controlling said detents, restoring means for said bars comprising a magnet and a reciprocating restoring member operated thereby, character members controlled by said selector bars, printing means operated by said character members, selecting means for said detent magnets, and means for operating said restoring magnet.

5. A printing telegraph comprising in combination a series of selector bars, means tending normally to move same in one direction, detents normally preventing such movement, magnets controlling said detents, a magnet and means operated thereby for restoring said selector bars, character members controlled by said selector bars, printing means operated by said character members, and selecting means for said detent magnets, comprising a sunflower having successively

operated contacts for said detent magnets and means controlling said printing and restoring magnets.

6. A printing telegraph comprising in combination a series of selector bars, means tending normally to move same in one direction, detents normally preventing such movement, magnets controlling said detents, a magnet and means operated thereby for restoring said selector bars, printing mechanism and means for operating same controlled by said selector bars and comprising a printing magnet, and selecting means for said detent magnets, comprising a sunflower having successively operated contacts for said detent magnets, means controlling said printing and restoring magnets, and a separator relay.

7. A printing telegraph comprising in combination a series of selector members, means comprising corresponding selector magnets for causing selected ones of said members to move to abnormal positions, character members controlled by said selector members, said selector members arranged by the movement of one or more of them to an abnormal position to select any desired one of said character members for operation, means comprising a printing magnet for operating the character member so selected, and control means for said selector and printing magnets comprising a sunflower having successively operated contacts for said selector magnets, means preventing operation of the selector magnets by short line current pulses, and means for deferring operation of the printing magnet until after the selector member or members operated have completed the selection of a character member.

8. A printing telegraph comprising in combination a series of selector members, means comprising corresponding selector magnets for causing selected ones of said members to move to abnormal positions, character members controlled by said selector members, said selector members arranged by the movement of one or more of them to an abnormal position to select any desired one of said character members for operation, means for operating the character member so selected, and control means for said selector magnets and character-member-operating-means comprising a sunflower having successively operated contacts for said selector magnets, means preventing operation of the selector magnets by short line current pulses, and means for prolonging the time for operation of the selected character member to embrace a portion of the time of operation of the sunflower during a subsequent selecting period.

9. A printing telegraph comprising in combination a series of selector members, means comprising corresponding selector magnets for causing selected ones of said

members to move to abnormal positions, character members controlled by said selector members, said selector members arranged by the movement of one or more of them to an abnormal position to select any desired one of said character members for operation, means comprising a printing magnet for operating the character member so selected, and control means for said selector and printing magnets comprising a sunflower having successively operated contacts for said selector magnets, a separator relay preventing operation of the selector magnets by short line current pulses, and means for deferring operation of the printing magnet until after the selector member or members operated have completed the selection of a character member.

10. A printing telegraph comprising in combination a series of selector members, means comprising corresponding selector magnets for causing selected ones of said members to move to abnormal positions, character members controlled by said selector members, said selector members arranged by the movement of one or more of them to an abnormal position to select any desired one of said character members for operation, means for operating the character member so selected, and control means for said selector magnets and character-member-operating-means comprising a sunflower having successively operated contacts for said selector magnets, a separator relay preventing operation of the selector magnets by short line current pulses, and means for prolonging the time for operation of the selected character member to embrace a portion of the time of operation of the sunflower during a subsequent selecting period.

11. A printing telegraph comprising in combination a series of selector members, means comprising corresponding selector magnets for causing selected ones of said members to move to abnormal positions, character members controlled by said selector members, said selector members arranged by the movement of one or more of them to an abnormal position to select any desired one of said character members for operation, means comprising a printing magnet for operating the character member so selected, and control means for said selector and printing magnets comprising a sunflower having successively operated contacts for said selector magnets, means preventing operation of the selector magnets by short line circuit pulses, and a relay controlled by said sunflower and controlling said printing magnet and arranged to delay operation of the printing magnet.

12. A printing telegraph comprising in combination a series of selector members, means comprising corresponding selector magnets for causing selected ones of said

members to move to abnormal positions, character members controlled by said selector members, said selector members arranged by the movement of one or more of them to an abnormal position to select any desired one of said character members for operation, means for operating the character member so selected, and control means for said selector magnets and character-member-operating-means comprising a sunflower having successively operated contacts for said selector magnets, means preventing operation of the selector magnets by short line current pulses, and a relay controlled by said sunflower and controlling the means for operating the selected character member, and arranged to delay operation of said character member.

13. A printing telegraph comprising in combination a series of selector members, means comprising corresponding selector magnets for causing selected ones of said members to move to abnormal positions, character members controlled by said selector members, said selector members arranged by the movement of one or more of them to abnormal position to select any desired one of said character members for operation, means comprising a printing magnet for operating the character member so selected, and control means for said selector and printing magnets comprising a sunflower having successively operated contacts for said selector magnets, means preventing operation of the selector magnets by short line current pulses, and a relay controlled by said sunflower and arranged to prolong the time for operation of the printing magnet.

14. A printing telegraph comprising in combination a series of selector members, means comprising corresponding selector magnets for causing selected ones of said members to move to abnormal positions, character members controlled by said selector members, said selector members arranged by the movement of one or more of them to an abnormal position to select any desired one of said character members for operation, means for operating the character members so selected, and control means for said selector magnets and character-member-operating-means comprising a sunflower having successively operated contacts for said selector magnets, means preventing operation of the selector magnets by short line current pulses, and a relay controlled by said sunflower and arranged to prolong the time for operation of the selected character member.

15. A printing telegraph comprising in combination a series of selector members, means comprising corresponding selector magnets for causing selected ones of said members to move to abnormal positions, character members controlled by said se-

lector members, said selector members arranged by the movement of one or more of them to abnormal position to select any desired one of said character members for operation, means comprising a printing magnet for operating the character member so selected, and control means for said selector and printing magnets comprising a sunflower having successively operated contacts for said selector magnets, a separator relay preventing operation of the selector magnets by short line current pulses, and a relay controlled by said sunflower and arranged to prolong the time for operation of the printing magnet.

16. A printing telegraph comprising in combination a series of selector members, means comprising corresponding selector magnets for causing selected ones of said members to move to abnormal positions, character members controlled by said selector members, said selector members arranged by the movement of one or more of them to an abnormal position to select any desired one of said character members for operation, means for operating the character member so selected, and control means for said selector magnets and character-member-operating-means comprising a sunflower having successively operated contacts for said selector magnets, a separator relay preventing operation of the selector magnets by short line current pulses, and a relay controlled by said sunflower and arranged to prolong the time for operation of the selected character member.

17. A printing telegraph comprising in combination a series of selector members, means comprising corresponding selector magnets for causing selected ones of said members to move to abnormal positions, character members controlled by said selector members, said selector members arranged by the movement of one or more of them to an abnormal position to select any desired one of said character members for operation, means for operating the character member so selected, and control means for said selector magnets and character-member-operating-means comprising a sunflower having successively operated contacts for said selector magnets, means preventing operation of the selector magnets by short line current pulses, means for prolonging the time for operation of the selected character member to embrace a portion of the time of operation of the sunflower during a subsequent selecting period, and restoring means for said selector members.

18. A printing telegraph comprising in combination a series of selector members, means comprising corresponding selector magnets for causing selected ones of said members to move to abnormal positions, character members controlled by said selec-

tor members, said selector members arranged by the movement of one or more of them to an abnormal position to select any desired one of said character members for operation, means for operating the character member so selected, and control means for said selector magnets and character-member-operating-means comprising a sunflower having successively operated contacts for said selector magnets, means preventing operation of the selector magnets by short line current pulses, means for prolonging the time for operation of the selected character member to embrace a portion of the time of operation of the sunflower during a subsequent selecting period, and restoring means for said selector members controlled by the sunflower.

19. A printing telegraph comprising in combination a series of selector members, means comprising corresponding selector magnets for causing selected ones of said members to move to abnormal positions, character members controlled by said selector members, said selector members arranged by the movement of one or more of them to an abnormal position to select any desired one of said character members for operation, means for operating the character member so selected, and control means for said selector magnets and character-member-operating-means comprising a sunflower having successively operated contacts for said selector magnets, means preventing operation of the selector magnets by short line current pulses, means for prolonging the time for operation of the selected character member to embrace a portion of the time of operation of the sunflower during a subsequent selecting period, and restoring means for said selector members controlled by said means for operating the selected character member.

20. A printing telegraph comprising in combination a series of type bar actions comprising approximately upright operating levers, a series of character bars movable approximately horizontally and each connected to and arranged to operate the operating lever of one of said type bar actions, selecting means adapted to be operated automatically to select one of said character bars, and driving means arranged to engage and operate a selected character bar.

21. A printing telegraph comprising in combination a series of type bar actions comprising approximately upright operating levers, a series of character bars movable approximately horizontally and each connected to and arranged to operate the operating lever of one of said type bar actions, notched selector bars arranged beneath said character bars, means for adjusting the same selectively, a reciprocating driving member arranged to engage a selected character bar, and means for reciprocating said member.

22. A printing telegraph comprising in combination a series of longitudinally movable character bars, printing mechanism operated by certain of said bars, selecting means for selecting at will any one of said bars, a paper carrier, and paper feeding means therefor comprising a ratchet, a pawl therefor, an oscillatory pawl carrier, two bell cranks, a link connecting one such bell crank to the pawl carrier, the other bell crank connected to one of said character bars, and a link connecting said bell cranks.

23. A printing telegraph comprising in combination a series of longitudinally movable bars, pivoted type bars, a vertically movable support to which such type bars are pivoted, means connecting said character bars and said type bars, whereby longitudinal movement of a character bar operates the corresponding type bar, type shift means comprising means operated by one of said character bars for raising the pivotal support of said type bars, a detent arranged to hold such pivotal support in such elevated position, and a magnet arranged to trip the detent.

24. A printing telegraph comprising in combination a carriage, means for feeding the same step by step comprising spring-actuated carriage-feed mechanism including an escapement, character members, selecting means for selecting at will any one of said members, power-storing carriage return means comprising ratchet mechanism and means operated concurrently with the feeding of said carriage to operate said ratchet mechanism, and a releasing device for said carriage return means controlled by said selecting means.

25. A printing telegraph comprising in combination a carriage, means for feeding the same step by step comprising spring-actuated carriage-feed mechanism including an escapement, character members, selecting means for selecting at will any one of said members, power-storing carriage return means comprising a return spring, ratchet mechanism for winding the same, means including a ratchet clutch for communicating motion from said spring to said carriage upon the release of the spring, and means operated concurrently with the feeding of the carriage to operate said ratchet mechanism, and a releasing device for said carriage return means controlled by said selecting means.

26. A printing telegraph comprising in combination a carriage, means for feeding the same step by step comprising spring-actuated carriage-feed mechanism including an escapement, character members, selecting means for selecting at will any one of said members, power-storing carriage return means comprising a return spring, means including a ratchet clutch for com-

communicating motion from said spring to said carriage upon the release of said spring, said ratchet clutch arranged to slip during winding of said spring, ratchet mechanism for
5 winding said spring, and means operated concurrently with the feeding of the carriage for operating said ratchet mechanism, and a releasing device for said spring controlled by said selecting means.

10 27. A printing telegraph comprising in combination a series of type bar actions, a carriage, carriage-feeding means operated by said actions when operated comprising spring-actuated carriage-feed mechanism in-
15 cluding an escapement, a series of character

bars connected to and arranged to operate corresponding ones of said series of type bar actions, a spacing bar arranged to operate said carriage-feeding means, a driver for said character bars and spacing bar, and se- 20 lecting means controlling engagement of said character bars and spacing bar by said driver.

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

JOHN C. BARCLAY.

Witnesses:

B. STEIN,

C. A. VAN BRUNT.