

(No Model.)

3 Sheets—Sheet 1.

G. H. DAVIS.
TYPE WRITING MACHINE.

No. 560,573.

Patented May 19, 1896.

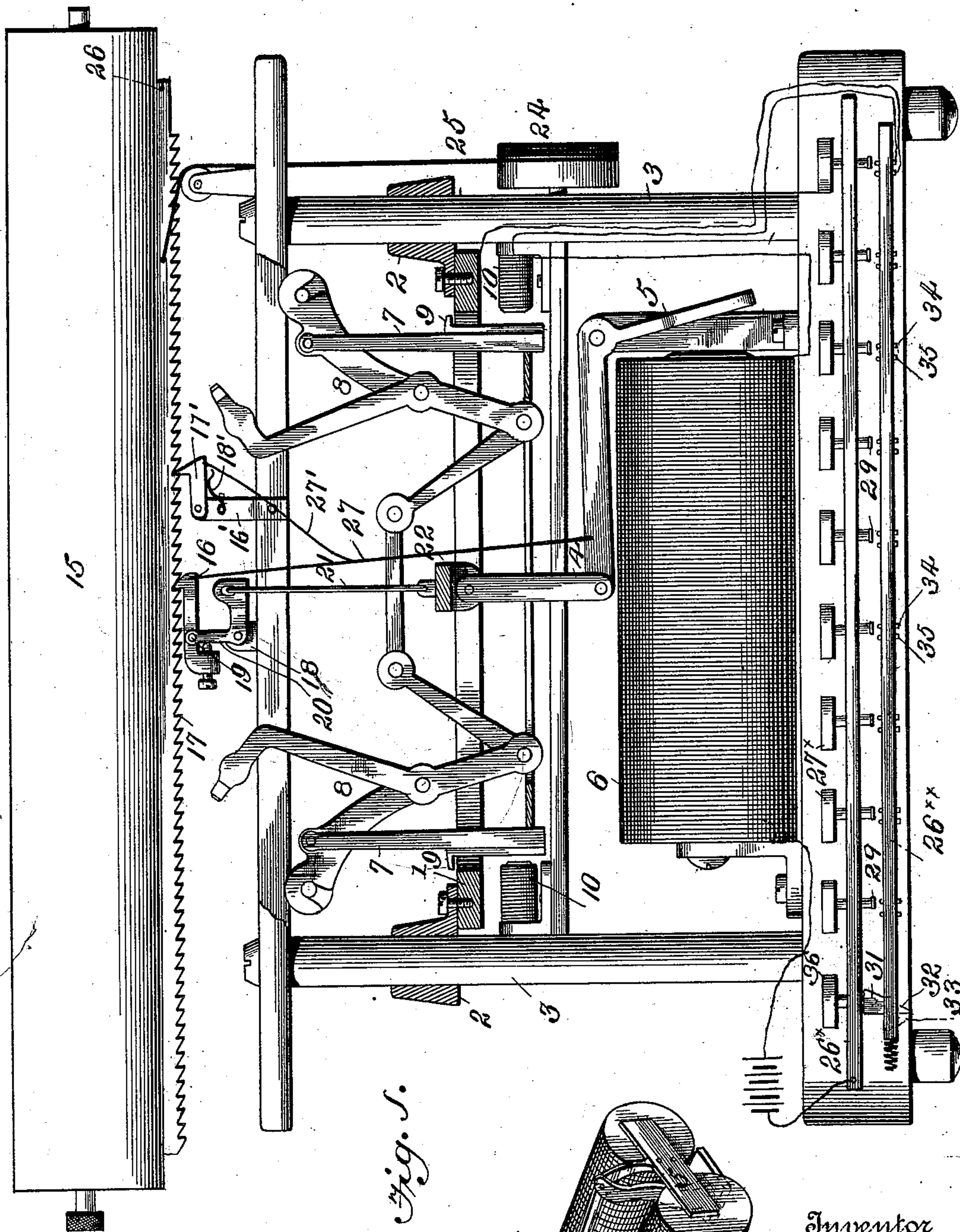


Fig. 1.

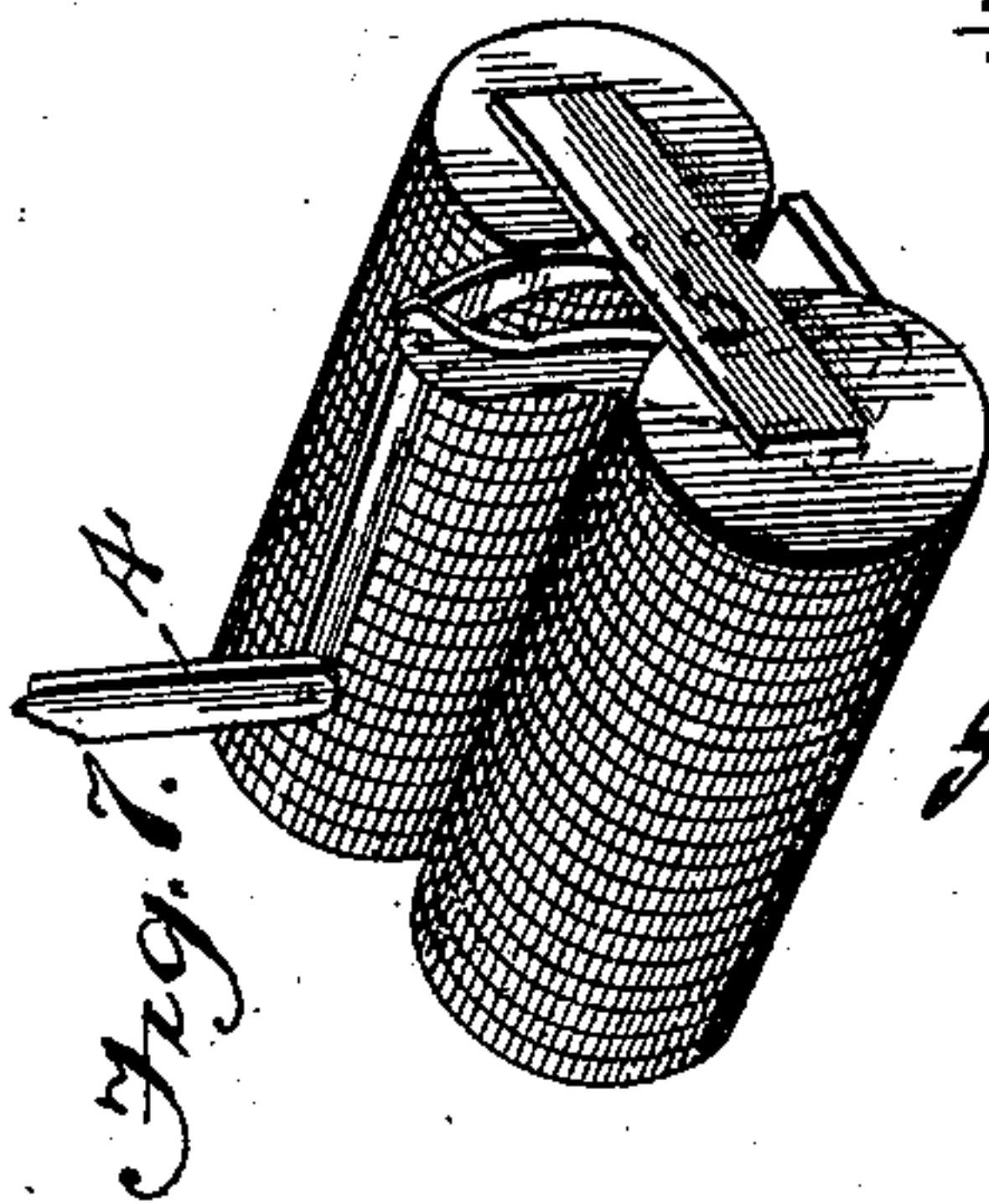


Fig. 2.

Witnesses

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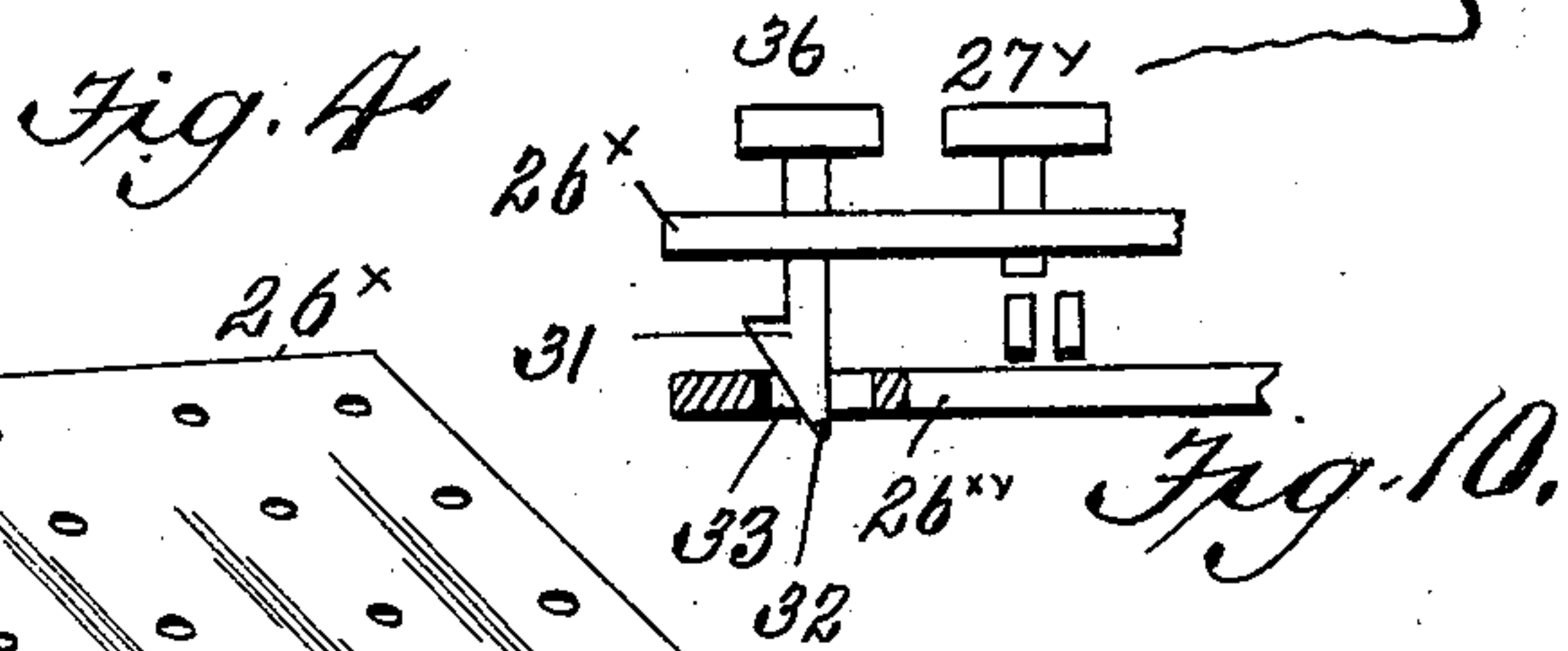
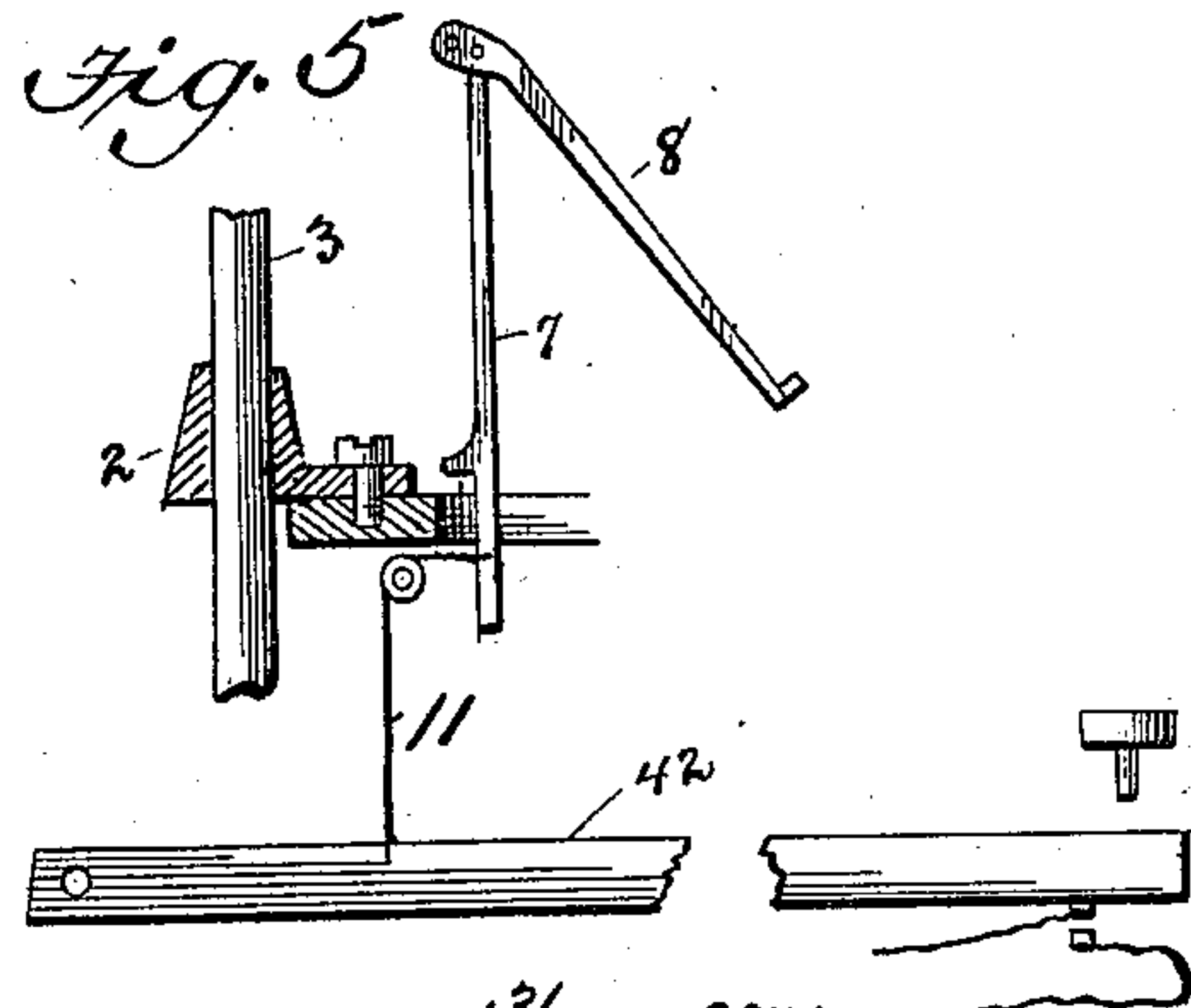
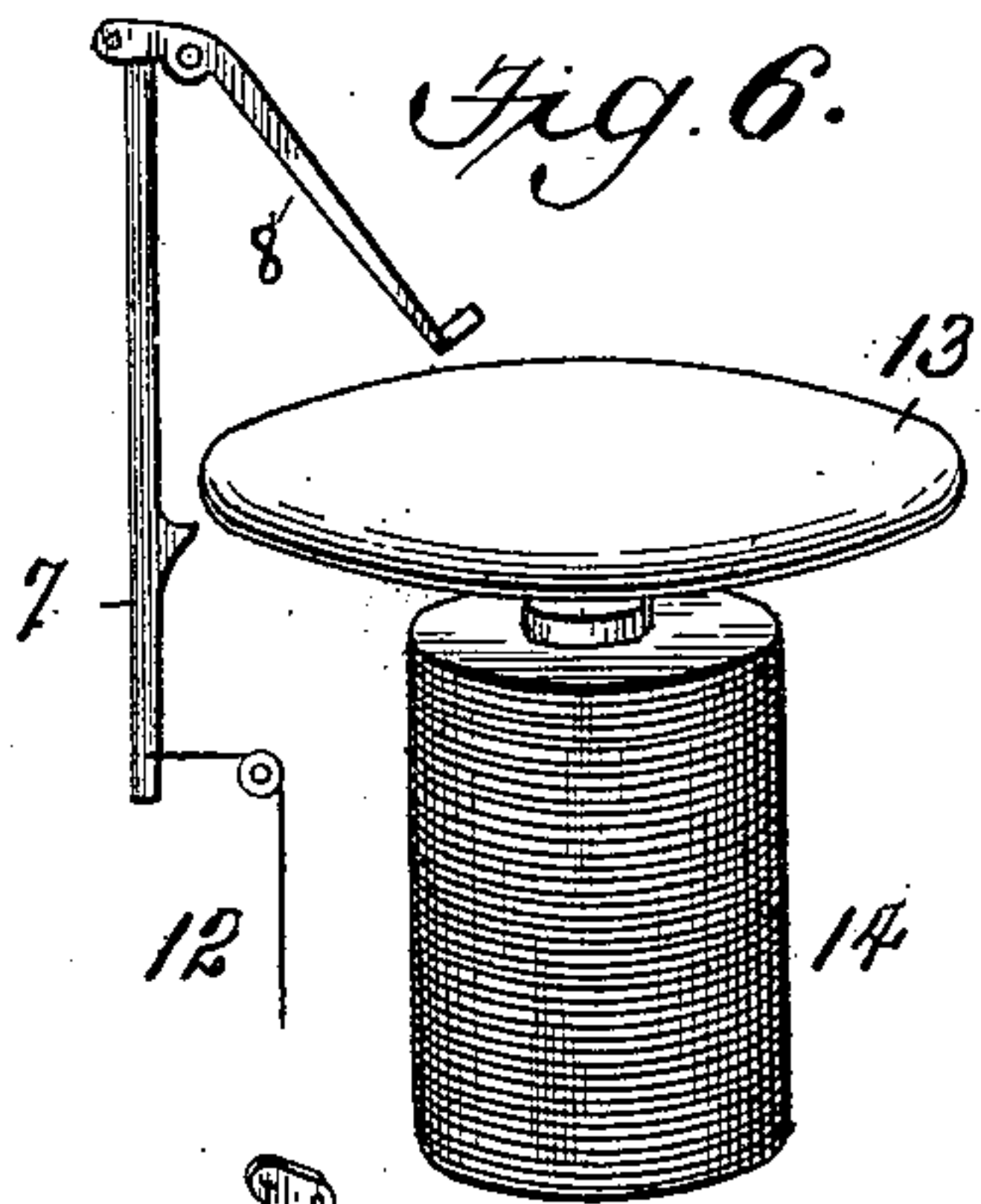
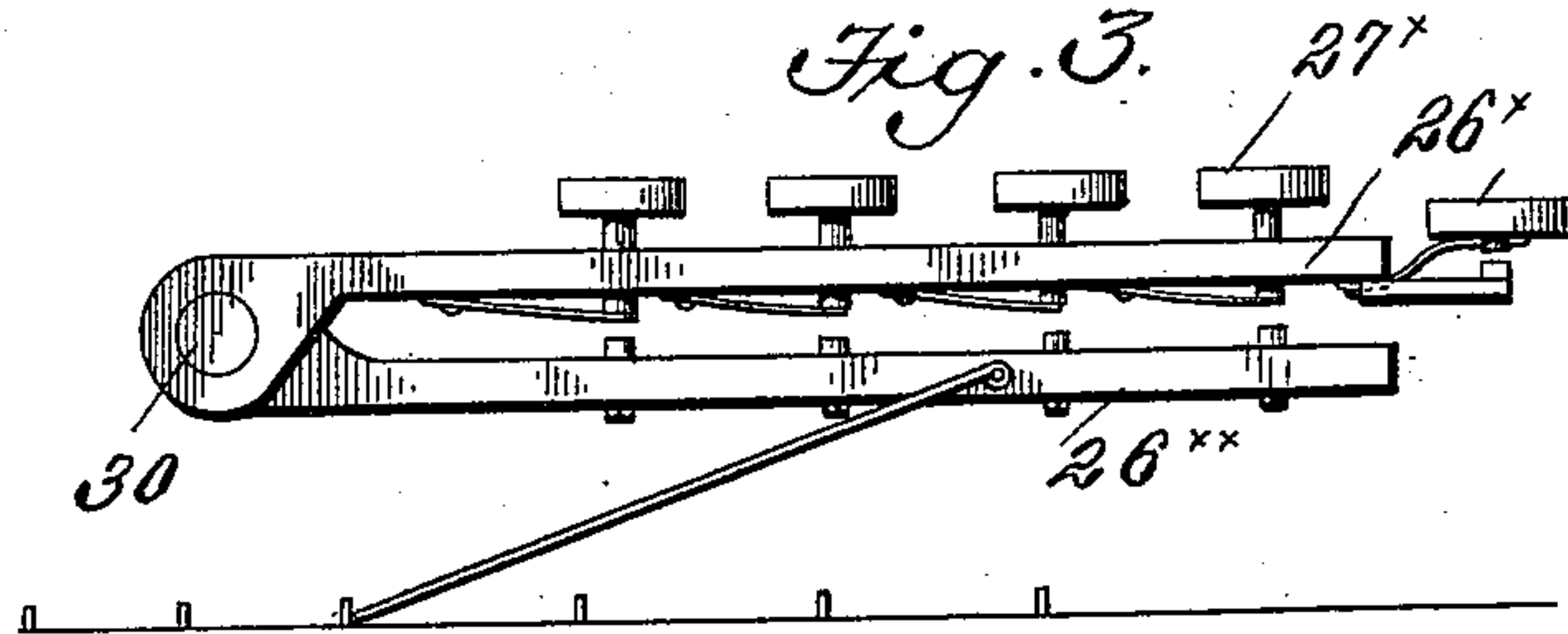
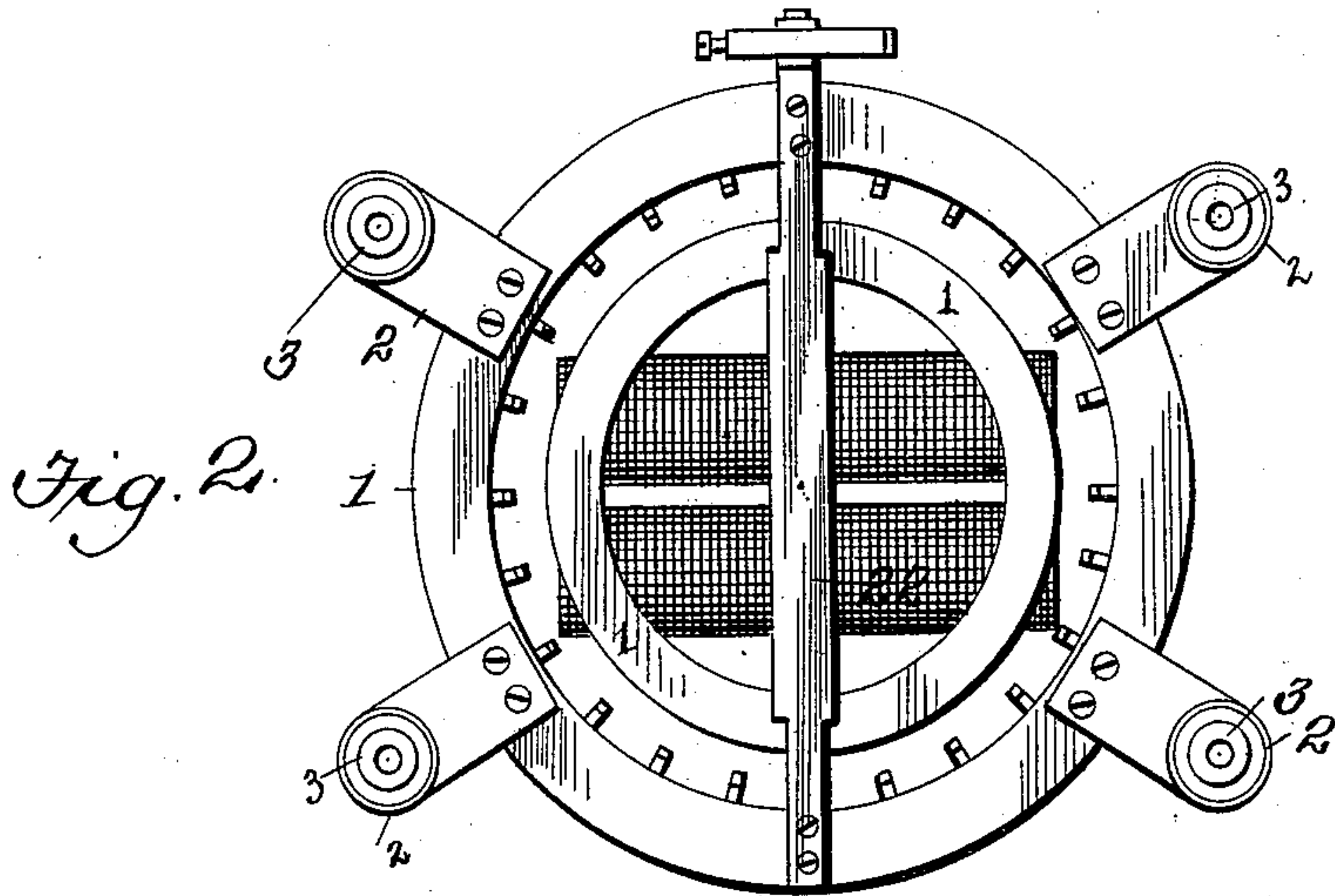
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3 Sheets—Sheet 2.

G. H. DAVIS.
TYPE WRITING MACHINE.

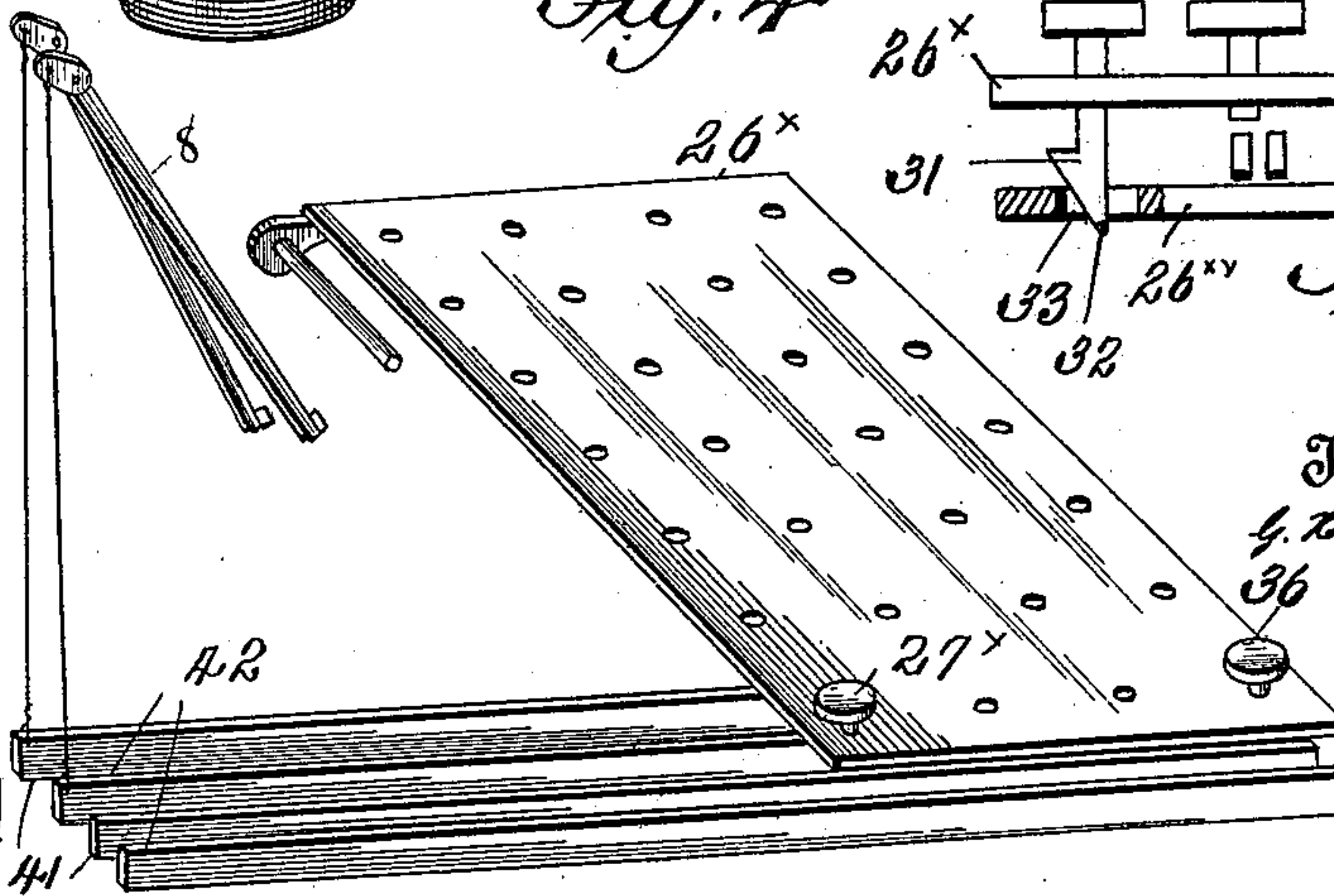
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Witnesses

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3 Sheets—Sheet 3.

G. H. DAVIS.
TYPE WRITING MACHINE.

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Fig. 8.

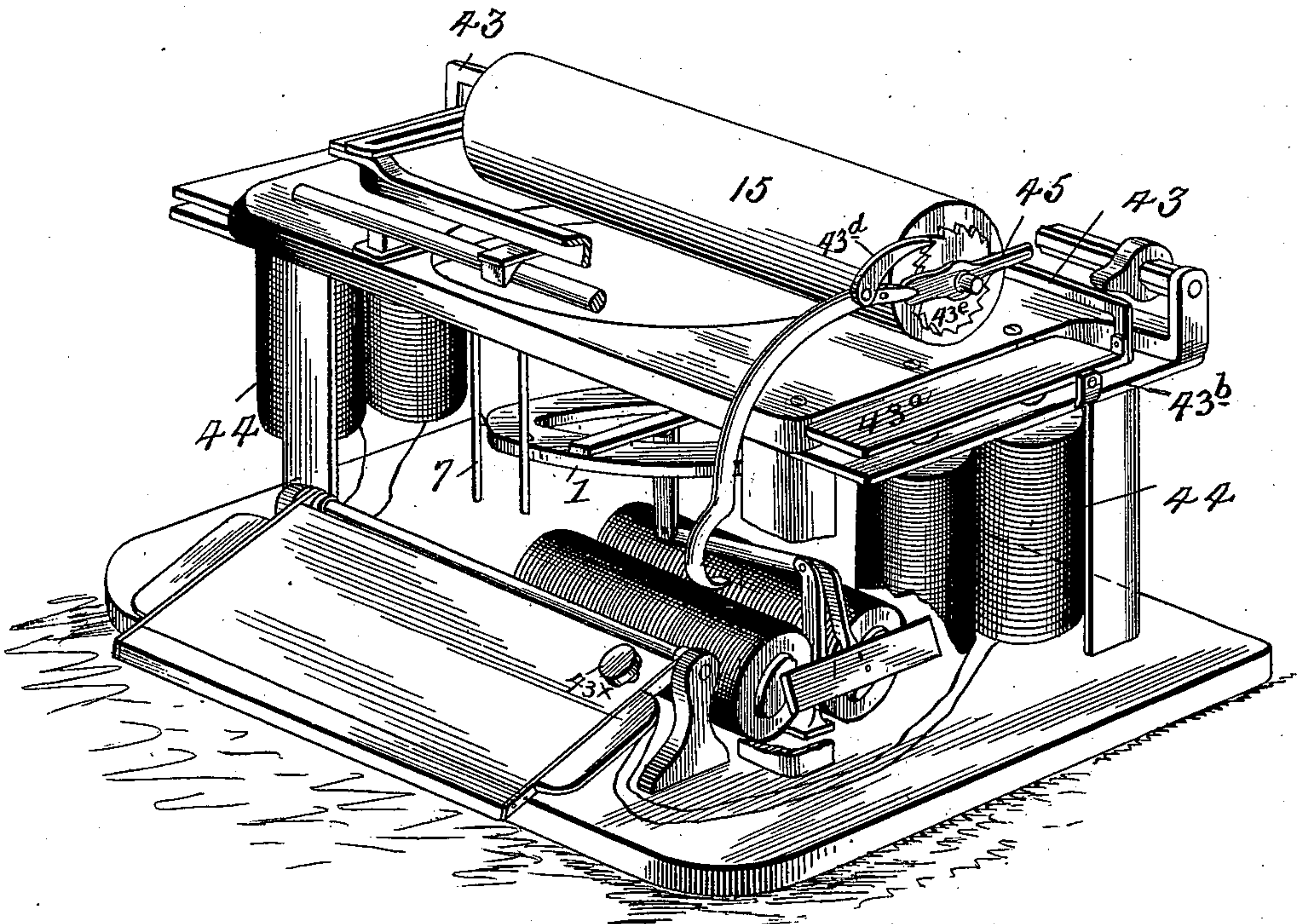
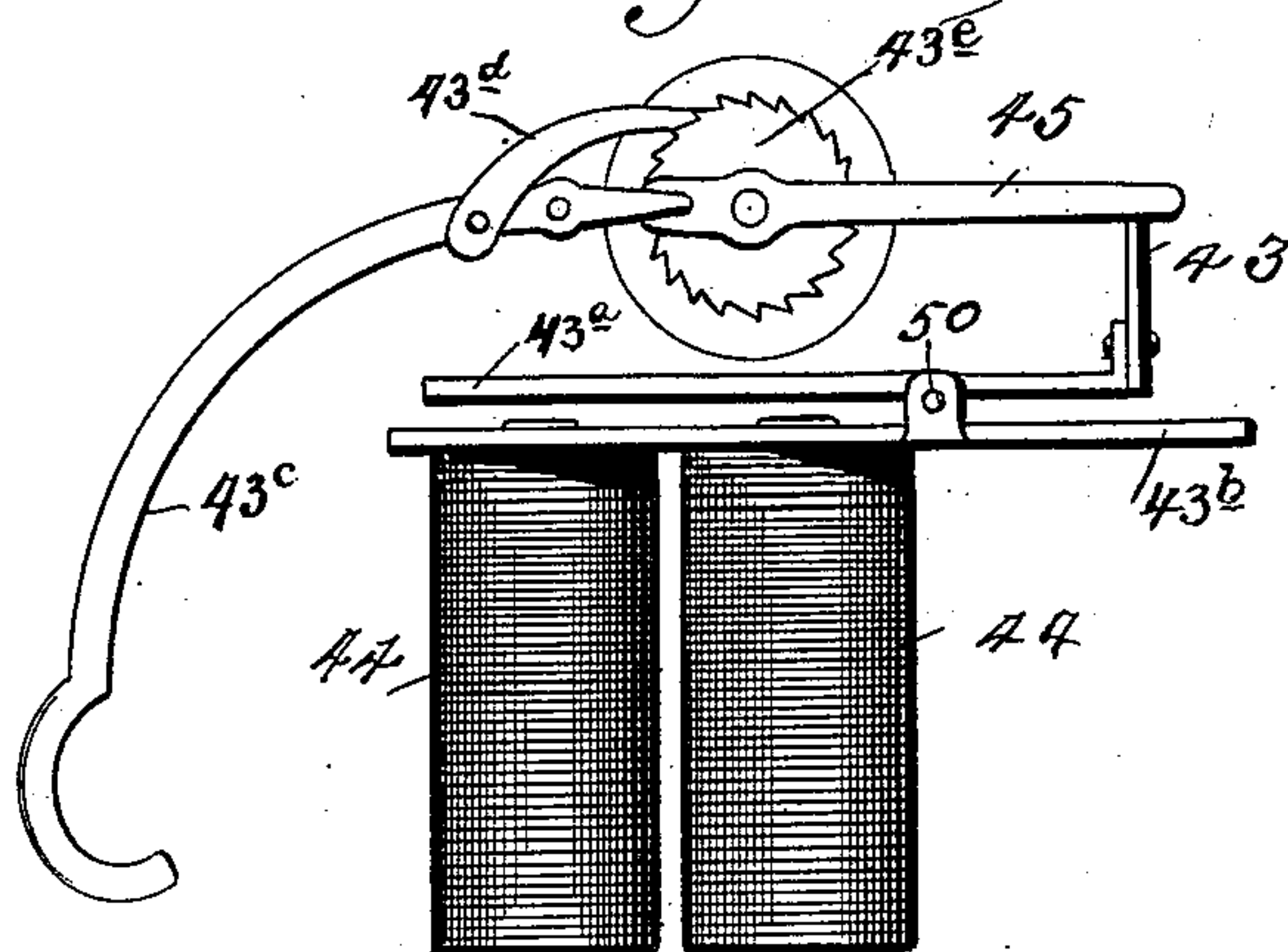


Fig. 9.



Witnesses

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UNITED STATES PATENT OFFICE.

GEORGE HOWLETT DAVIS, OF NEW YORK, N. Y.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 560,573, dated May 19, 1896.

Application filed November 15, 1894. Renewed April 27, 1896. Serial No. 589,330. (No model.)

To all whom it may concern:

Be it known that I, GEORGE HOWLETT DAVIS, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented a certain new, useful, and valuable Improvement in Electrical Type-Writing Machines, of which the following is a full, clear, and exact description.

My present invention relates to electrical type-writing machines, and has for its object to provide the combination and arrangement of parts such as are illustrated in the annexed drawings and as will be hereinafter fully described.

In the said drawings, Figure 1 is a vertical section of my machine, taken in a substantially central longitudinal plane. Fig. 2 is a plan view of the same, having the carriage and platen removed. Fig. 3 is a side view of the keyboard. Fig. 4 is a modification of my keyboard as may be applied to mechanically-operated type-writing machines. Fig. 5 is a detailed view showing a modification of my locking device. Fig. 6 shows a modification of my reciprocating plate and magnet. Fig. 7 is a perspective view of the large magnet 6 and its armature-lever. Fig. 8 is a perspective view of a type-writer with my improved platen-roller-operating mechanism applied thereto. Fig. 9 is an end view of the platen and showing the operating-magnet and armature-lever therefor. Fig. 10 is a sectional view of the keyboard illustrated in Fig. 4.

Similar numerals of reference indicate corresponding parts throughout the several views.

One of the leading features of my improvement is a reciprocating engagement plate or ring, which in Figs. 1, 2, and 5 I have shown in the form of an annulus 1, and which I will designate a "reciprocating plate," although it is to be understood that it may be made in the form of a solid plate, said reciprocating plate being movably supported by the sleeves 2, working over the four standards 3, and being connected by rod 4 to the bell-crank armature 5, which, upon the magnet 6 becoming energized, instantly raises the rod 4 and the reciprocating plate 1 a distance approximating one-half inch, and upon the breaking

of the current passing through magnet 6 the said rod and reciprocating plate immediately drop down from their own weight or gravity into their normal position. The rods 7, connected to the fulcrumed type-bars 8, are provided with projections 9, which latter engage and lock with the reciprocating plate 1 whenever the rod 7 is drawn outwardly by the small magnet 10, which is energized simultaneously with the main magnet 6, Figs. 1 and 2, or by the cord 11, Fig. 5.

In the modification shown at Fig. 6 the rod 7 is drawn inwardly by the cord 12, as shown, or by a magnet, as shown at Fig. 1, so as to throw its projection under instead of over the periphery of the disk-armature 13, which is drawn downward by the large magnet 14, in which arrangement no rod 4 or bell-crank armature 5 is necessary, but prefer the arrangement shown at Figs. 1 and 2. I effect the movement of the platen 15 by a pawl 16, working in a rack 17, attached to the frame 18 of the carriage, said pawl being pivoted at point 19 on the bell-crank 20, which is given movement by the rod 21, connecting it to the cross-piece 22, rigidly secured on the reciprocating plate 1, all substantially as shown. I prefer to propel my carriage against a spring, which in the present instance I have shown in the form of a spring-drum 24, which normally exerts a tension on the cord 25, indirectly attached at its opposite end to the carriage at point 26, so that upon releasing the pawl 16, by drawing it away from the rack through the medium of the cord 27, or otherwise disengaging it from the rack, the carriage is automatically returned by the cord 25. A short bracket-arm 16' is rigidly secured to the frame of the machine alongside the pawl 16, and to the upper end of said arm is pivoted a pawl 17', which is kept normally into engagement with the rack 17 by means of a spring 18'. To the outer end of the pawl 17' is connected a branch cord 27', which leads to and is attached to the cord 27, so that by pulling upon the cord 27 to operate the pawl 16 strain is also imparted to the pawl 17', which is likewise operated or thrown out of engagement with the rack 17, whereby the carriage is free to be drawn back to its starting position by means of the spring 24 and cord 25. The pawl

17' serves to prevent the carriage from moving back with the return of the feed-pawl 16 under the tension of the spring 24.

My mechanism is applicable to any form of type-bars and to nearly any form of type-writing machines.

Another leading and important feature of the present invention is my shifting-key board, whereby the need of a shifting carriage, all forms of which are more or less awkward, clumsy, and expensive, is avoided, and I attain this end in the electrical shifting-key board shown in Figs. 1 and 3, in which 26^x represents a hinged plate carrying the series of keys 27, and are preferably soldered to the flat spring 29, which normally keeps them slightly raised. Arranged directly under said plate 26^x is a somewhat similar plate 26^{xx}, preferably of non-conducting material, such as hard rubber, and which is so hinged on the rod 30 as to permit of a slight lateral movement when the shifting-key 31 is depressed, so as to cause its lower beveled end 32 to enter an oblong hole 33 in said plate 26 and slide it slightly to the right. The metal contact-pins 34 35 are preferably arranged in pairs, so that whenever the under plate 26^{xx} is shifted about one-eighth of an inch to the right the end of the spring 29 will be directly over the pin 35, instead of over pin 34, as shown, which is its normal position, and therefore those pins 34 are preferably connected electrically, so as to operate the lower-case letters, and the left-hand pins 34 to operate the upper case or capitals of the corresponding letter or character.

In Fig. 4 I illustrate means for applying my shifting-key board to mechanically-operated type-writers; but in this case the depression of the shift-key 36 slides the upper plate, so as to set the lower ends of the keys 40 over the reeds 41, connected to the cap, instead of over the reeds 42, connected to the lower case and over which the lower and impinging end of the keys 36 set.

In the modification shown by Figs. 8 and 9 it will be noticed that the frame of the writing-machine therein shown resembles the Remington type-writer, and that the rods 7 in order to engage with the reciprocating plate must be drawn inwardly. In these figures I also show means for revolving the platen 15, which effects the feeding of the paper, as is well known, and the means employed consist, essentially, of the horizontal feed-rod 43, that is arranged in rear of and extends the entire width of the carriage, and which is provided at one or both ends with a forwardly-projecting plate 43^a, which lies alongside of and is pivoted at 50 to the plate or plates 43^b, connected to the side of the type-writer frame in any suitable manner. The plate or plates 43^b are provided with apertures to admit the heads of electromagnets 44, which lie directly below the same, so that when a suitable key 43^x is depressed the magnets will be energized and plates 43^b attracted or drawn down, which in

turn raises the rod 43. Said rod, acting upon the rear end of lever 45, raises the same. The forward end of this lever 45 being connected to the rear end of the ordinary hand-operated platen-lever 43^c or its equivalent, pushes the same downward, and in so doing actuates the pawl 43^d against the ratchet-wheel 43^e, thereby revolving the platen a line-space. It will be understood that the magnets and platen-operating mechanism may be located at one or both sides of the type-writer, and that the operating key or keys may likewise be placed upon either or both sides of the keyboard, so as to be in easy reach of the operator to be actuated by either hand. It will be noticed that the inwardly-extending end of lever 45, forming part of the carriage and moving laterally therewith, rests and slides upon the feeding-rod 43 in whatever position the carriage may be. By suitably connecting the cord 27, attached to the releasing-pawl 16, to the feed-rod 43 the release and return of the carriage and the feeding of paper are effected by the movement of said feed-rod 43, which, as heretofore stated, may be operated either by the double magnets 44 or by the universal armature 1.

The universal armature 1, instead of being an annular form, may be straight, slightly curved, segmental, or crescent shape, which will best adapt it to the machine to which it is to be applied.

I claim—

1. In a type-writing machine, the combination with the type-bar-operating levers, of a reciprocating plate or body, mechanism intermediate the plate and levers whereby the latter may be coupled to one edge of the plate, and means for reciprocating the plate whereby the type-levers are operated, substantially as described.

2. In a type-writing machine, the combination with the type and similar levers, of a reciprocating plate or body, a rod connected to each of said levers, means for bringing said rods into engagement with the plate, and means for reciprocating the latter whereby the levers are carried by the movement of the plate, substantially as described.

3. In an electrical type-writing machine, the combination with the type and similar levers, of a reciprocating plate, a depending rod pivoted to each lever and arranged concentric to said plate, and means for bringing said rods into engagement with one edge of the plate, as and for the purpose described.

4. In a type-writing machine, the combination with the type and similar levers, of a circular reciprocating plate, a depending rod pivoted to each lever and arranged concentric to the plate, means acting upon the lower end of each rod for bringing them into engagement with one edge of the plate, and means for reciprocating the latter, as and for the purpose described.

5. In an electrical or other type-writing machine, the combination with the type or

other levers, lugs projecting from said levers, of a reciprocating plate, means for operating said plate, and means for throwing said levers alongside the plate whereby the lugs will overhang one edge of, and be carried by the movement of the plate, as and for the purpose set forth.

6. In a type-writing machine, the combination with the type and other levers, a depending rod pivoted to each lever, lugs projecting from said rods, of a reciprocating plate, and means for throwing said levers alongside the plate whereby the lugs will overhang one edge of and be carried by the movement of the latter, substantially as described.

7. In an electrical type-writing machine, the combination with the type and similar levers, of a depending rod pivoted to each lever, a lug projecting from each rod, a reciprocating plate, electromagnets arranged around said plate and adapted when energized to attract the free end of the rods and bring the same into engagement with the plate, and means for reciprocating the latter while the rods are in engagement therewith so that the levers will be operated, substantially as described.

8. In an electrical type-writing machine, the combination with the type and similar levers provided with downwardly-extending rods having lugs near their lower ends, of a circular reciprocating plate around which said rods are arranged, electromagnets for bringing said rods into engagement with one edge of the plate whereby the lugs will overhang the latter, an enlarged magnet located directly below the reciprocating plate, a bell-crank armature-lever operated by the enlarged magnet, and a connection between the armature-lever and the reciprocating plate whereby the latter is moved when the magnet is energized, substantially as described.

9. In an electrical type-writing machine the combination, with the type and other levers, of a reciprocating plate and guides for the latter, a traveling carriage provided with a rack, means for throwing the levers into engagement with said plate, and a pawl adapted to be operated by the movement of the reciprocating plate whereby the carriage is fed or advanced, as and for the purpose described.

10. In an electrical type-writing machine, the combination with the type and other levers, of an electrically-operated reciprocating plate, means for throwing said levers into engagement with the plate, a movable carriage provided with a rack, a pawl operated by the movement of said plate to feed the carriage forward, and means for retaining said pawl in a disengaged position to allow the carriage to travel free, as and for the purpose set forth.

11. In an electrical type-writing machine, the combination with the type and similar levers, of a reciprocating plate, magnets for throwing said levers into engagement with the plate, an enlarged magnet lying below the

reciprocating plate, an armature-lever for said magnet, a connection between the armature-lever and plate, a traveling carriage provided with a rack, a pawl normally engaging the rack and adapted when moved to advance the carriage, a connection between the pawl and reciprocating plate, a second pawl engaging the rack and adapted to prevent the carriage from running free when said former-named pawl is disengaged, means for simultaneously freeing both of said pawls from the rack, a spring-drum, and a flexible connection between the carriage and spring-drum, as and for the purpose described.

12. In an electrical type-writing machine having a moving carriage provided with a rack-bar, the combination with the type and similar levers, of a reciprocating plate, means for throwing the levers into engagement with said plate, and a pivoted pawl meshing with the rack-bar and connected to the reciprocating plate and adapted to be operated by the movement of the latter whereby the carriage is fed or advanced, substantially as described.

13. In a type-writing machine, the combination with the type and similar levers having depending rods pivotally connected thereto, of a reciprocating plate, an electromagnet for each depending rod, said magnets acting to bring the rods into engagement with the plate, sleeves mounted upon said reciprocating plate, guide-rods passing through said sleeves, an electromagnet for operating said reciprocating plate, an electrically-connected keyboard, a battery and circuit including the aforesaid magnets and keyboard, and keys adapted when depressed to complete the electric circuits and operate the type-levers and reciprocating plate, substantially as described.

14. In a type-writing machine, the combination with the movable carriage and platen, of a vertically-moving feed-rod running lengthwise of and located to the rear of the carriage, an armature-plate pivoted near one end to the type-writer frame and connected at said pivoted end to the feed-rod a ratchet on the platen, a pawl engaging the ratchet, an arm pivoted to the platen and connecting the pawl, said arm overhanging the feed-rod, and electromagnets lying below the armature-plate and adapted when energized to attract the plate, raise the feed-rod and revolve the platen, substantially as described.

15. In a type-writing machine the combination with the movable carriage and platen, of a pivoted feed-rod running lengthwise of the carriage, a ratchet on each end of the platen, a pawl engaging each ratchet, an arm pivoted to each end of the platen and connected to the pawls, said arms overhanging the feed-rod, an armature lever or plate pivoted to each side of the machine-frame and connected at their rear ends to the feed-rod, electromagnets lying beneath each armature-lever, and a suitable key adapted when depressed to complete an electric circuit where-

by the magnet is energized and the feed-rod raised to revolve the platen, substantially as described.

16. A keyboard for electrical type-writing machines consisting of the upper and lower plates slidably hinged at their rear ends, electrically-connected keys carried by the upper plate, a series of sets of electrical contact-points carried by the lower plate, a slot in said latter-named plate, a wedge-shaped key carried by the upper plate and engaging the

aforesaid slot, and adapted when depressed to shift the lower plate, and a spring for returning the shifted plate to its normal position when the wedge-key is withdrawn, substantially as described.

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

GEORGE HOWLETT DAVIS.

Witnesses:

CHARLES T. DAVIS,
C. T. DAVIS, Jr.