

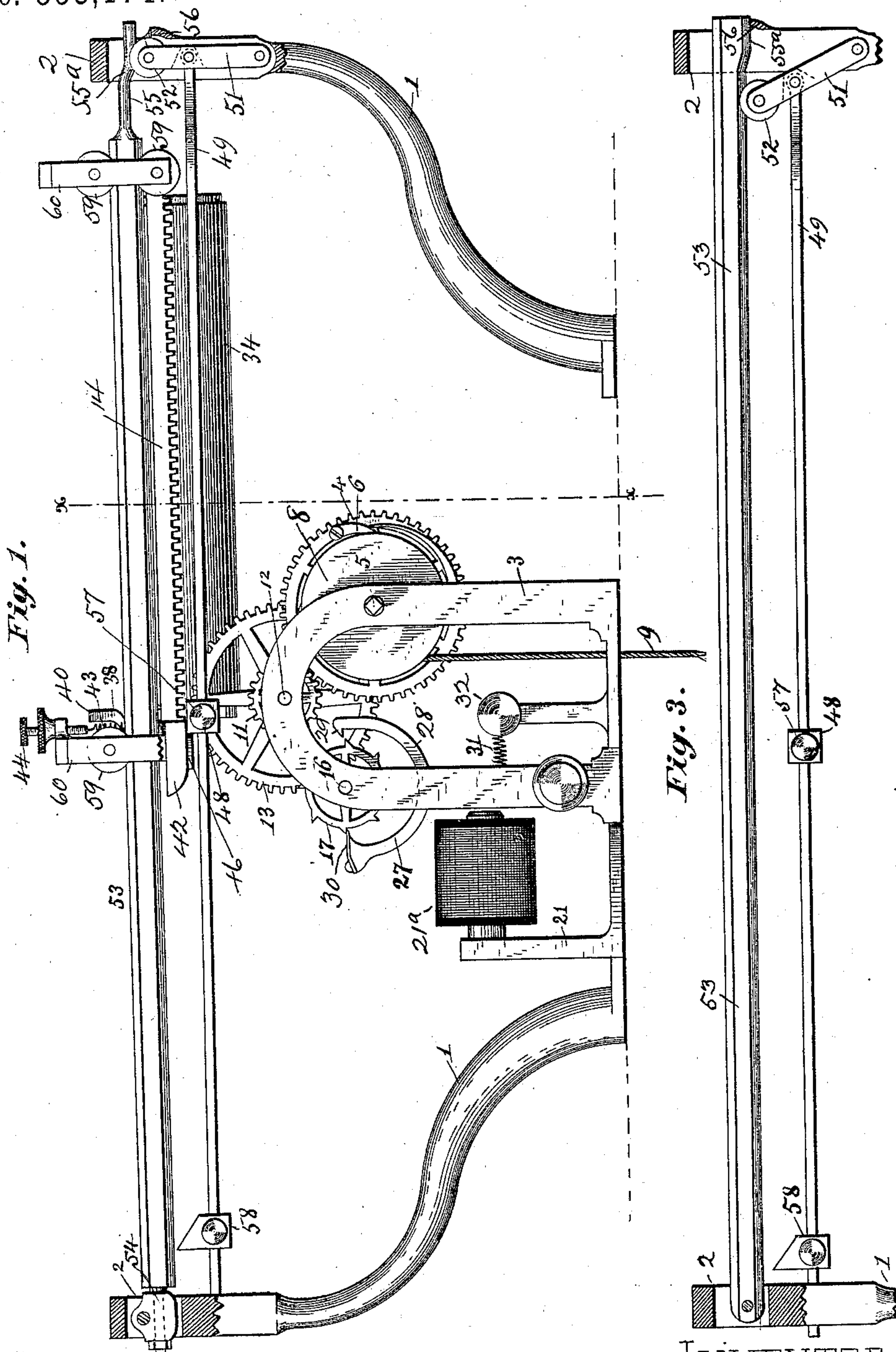
(No Model.)

3 Sheets—Sheet 1.

J. F. McLAUGHLIN.  
TYPE WRITING MACHINE.

No. 553,174.

Patented Jan. 14, 1896.



ATTEST:

*Riley C. Bowen*  
*Car B. Waller*

INVENTOR:

*James F. McLaughlin*  
*By Harding Dickerson*  
*his Attorneys.*

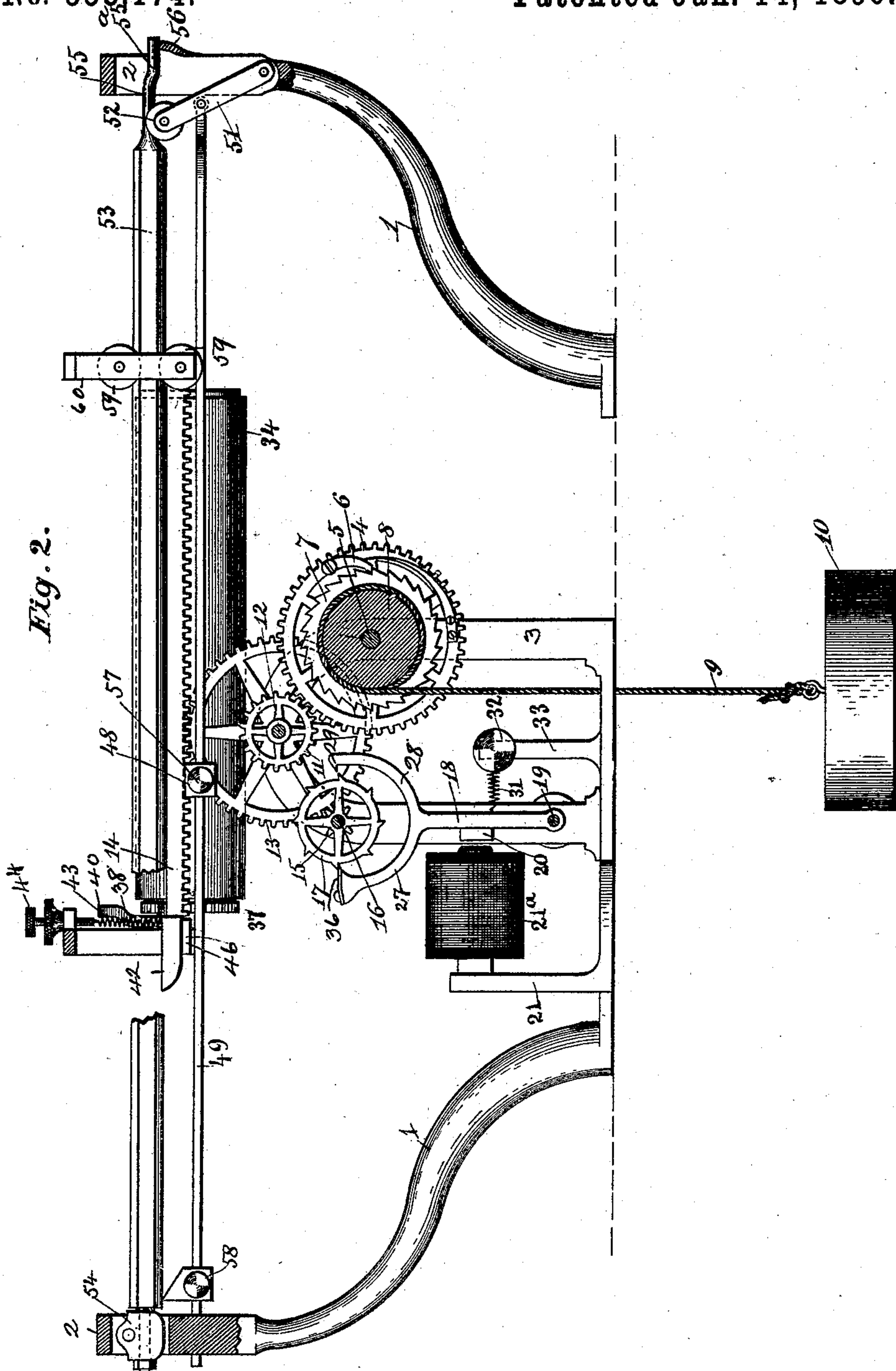
(No Model.)

3 Sheets—Sheet 2.

J. F. McLAUGHLIN.  
TYPE WRITING MACHINE.

No. 553,174.

Patented Jan. 14, 1896.



ATTEST:

*Rey Brown*  
*Car Blouder*

INVENTOR:

*James F. McLaughlin*  
*By Harding & Lichenor*  
*his Attorneys.*



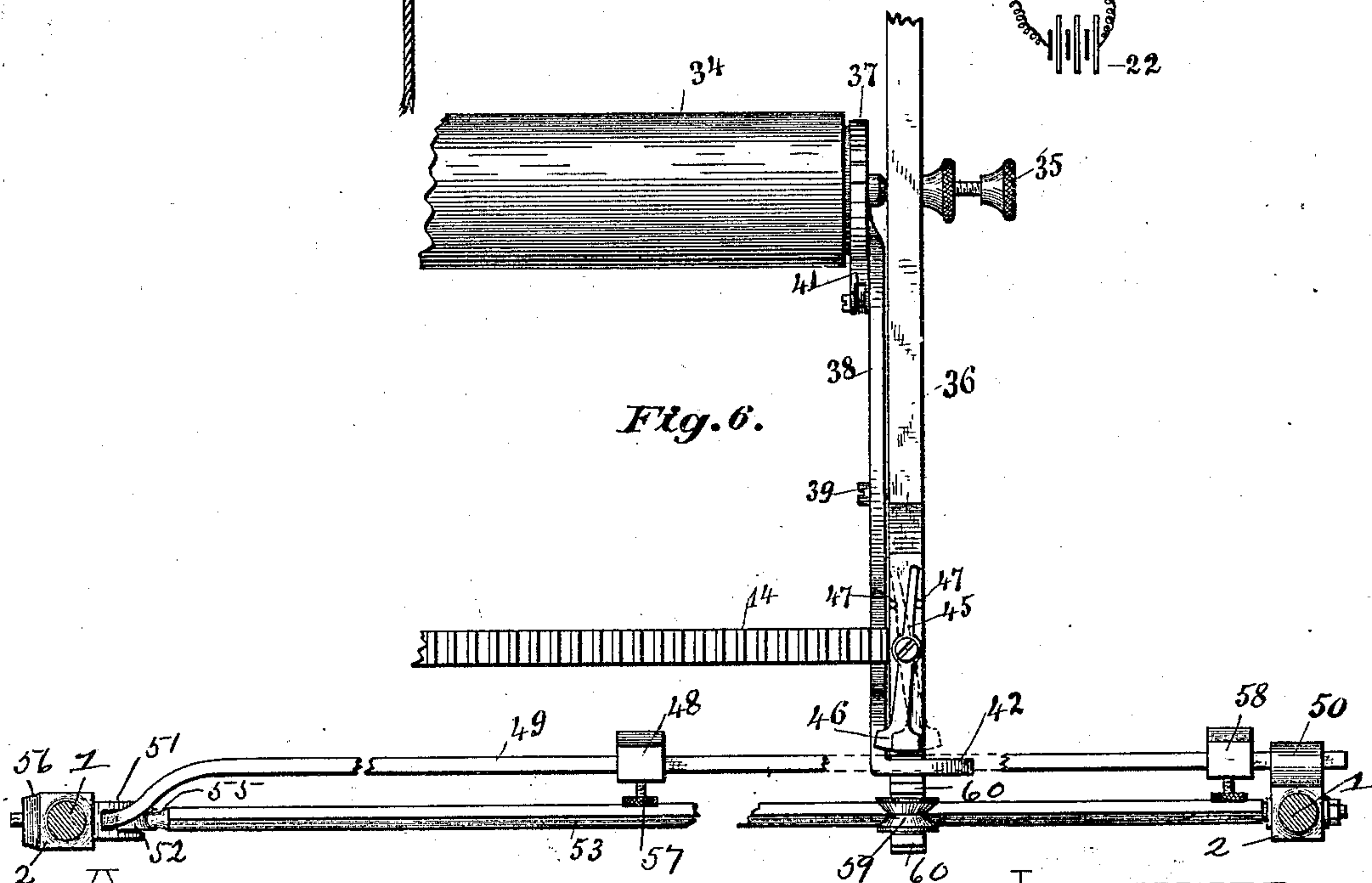
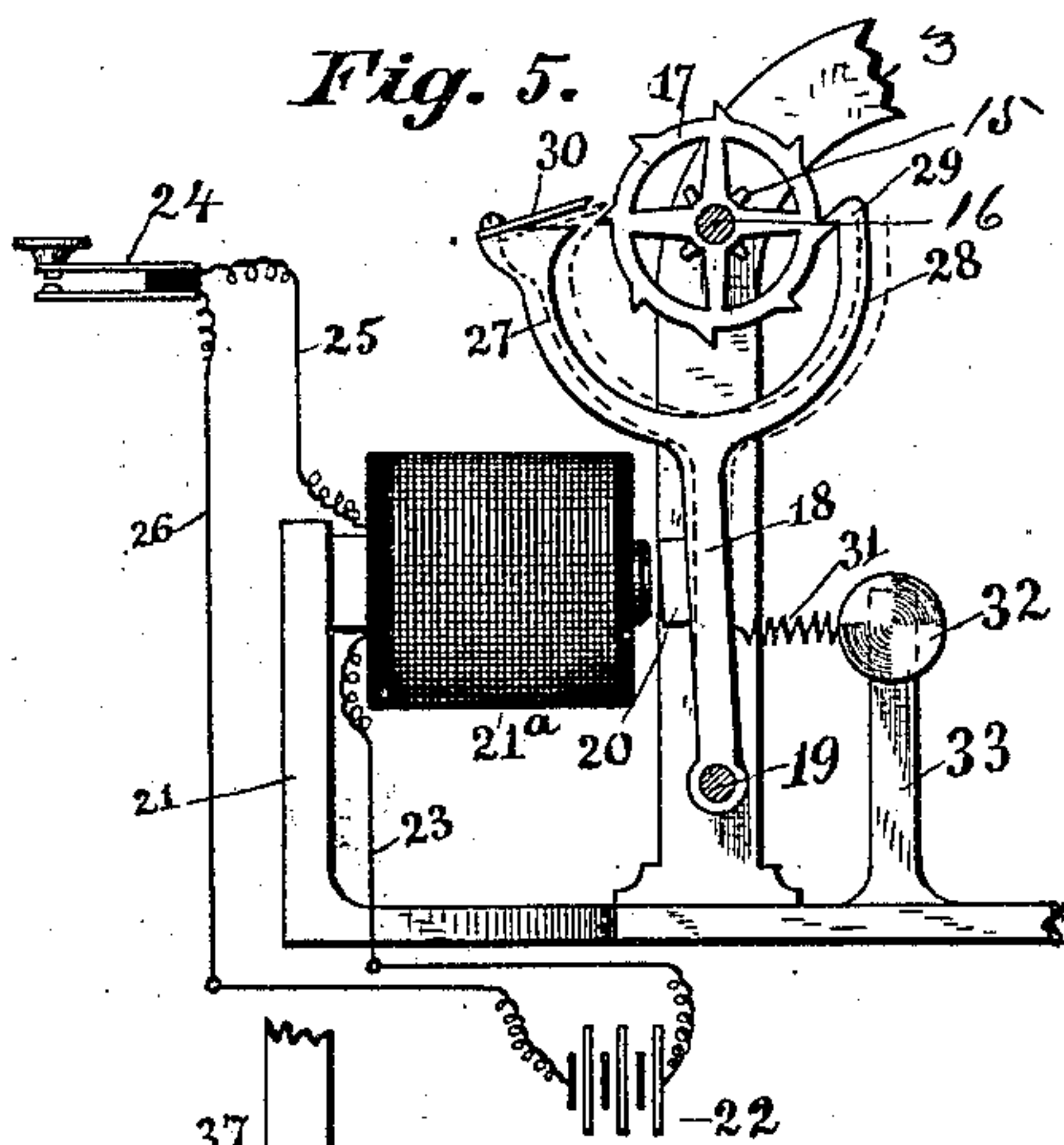
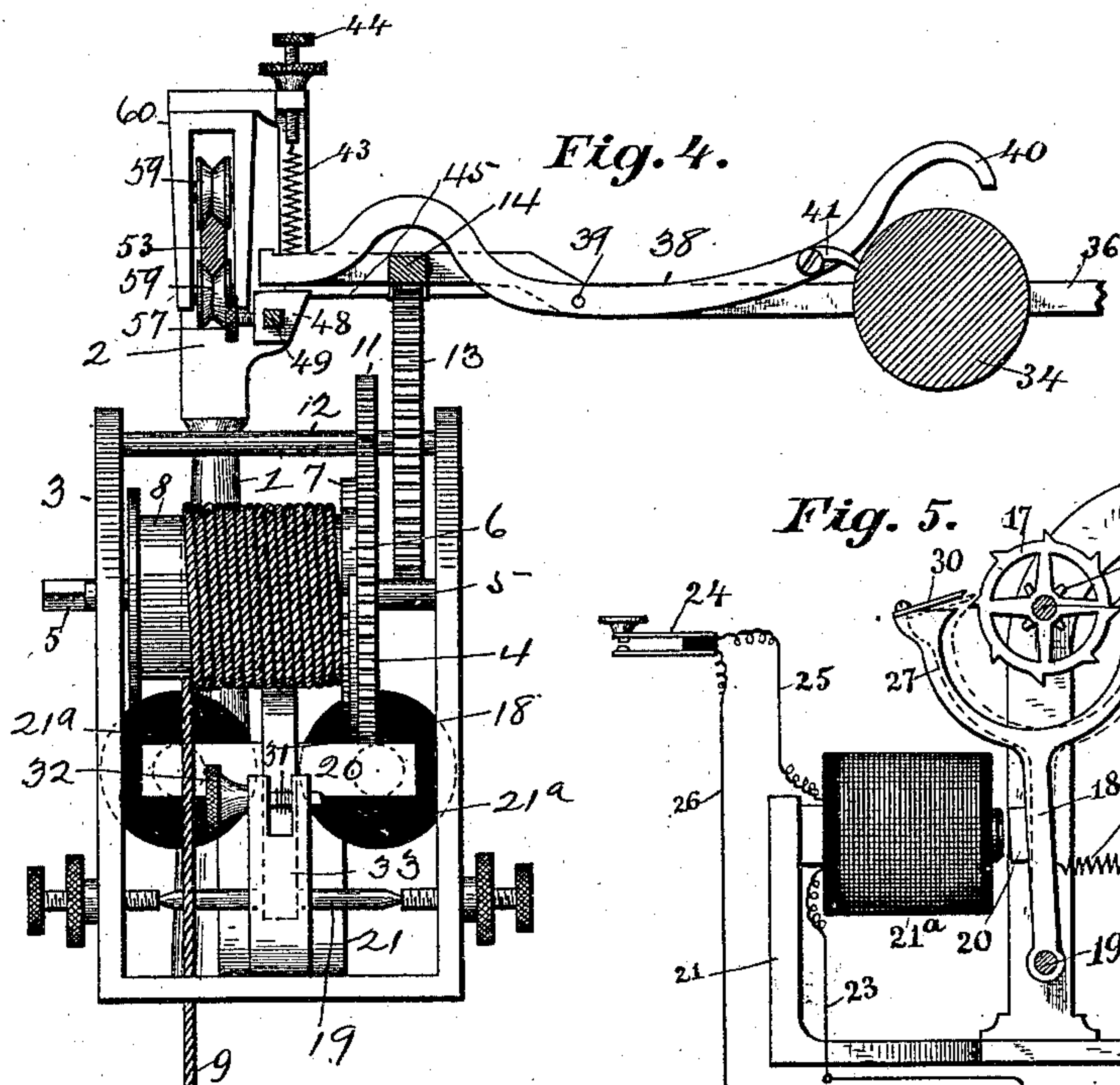
(No Model.)

3 Sheets—Sheet 3

J. F. McLAUGHLIN.  
TYPE WRITING MACHINE.

No. 553,174.

Patented Jan. 14, 1896



ATTEST:

*Ray C. Bowen.*  
*Car. B. Miller*

INVENTOR:

*James F. McLaughlin;*  
*By Harding Tichenor*  
*his Attorneys.*



# UNITED STATES PATENT OFFICE.

JAMES F. McLAUGHLIN, OF PHILADELPHIA, PENNSYLVANIA.

## TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 553,174, dated January 14, 1896.

Application filed November 8, 1887. Serial No. 254,626. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES F. McLAUGHLIN, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Electrical Type-Writing Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to an electrical type-writing machine; and it consists in certain details of construction, arrangements and combinations of parts, all of which will be more fully described hereinafter, and the specific points of novelty in which will be designated in the appended claims.

Referring to the accompanying drawings, Figure 1 is a view in rear elevation of the traveling carriage, its attached mechanism, the step-by-step motor for advancing the same in proper operative relation to the rack-bar, and the mechanism for automatically reversing or recoiling the said carriage when it reaches the limit of its forward travel, the base and other non-essential portions of the apparatus not being illustrated for the sake of clearness and simplicity, and the carriage in a position for recoil. Fig. 2 is a similar view, with this difference, however, that the horseshoe-frame of the motor is removed for a full view of the electromagnetic escapement for the step-by-step motor, and that the carriage is in a different position from that shown in Fig. 1. Fig. 3 is a detail view with parts broken away of a modification of the rear guide-bar of the traveling carriage and certain auxiliary devices which co-operate to place the carriage in the proper position to recoil. Fig. 4 is a transverse section taken on the line *xx* of Fig. 1. Fig. 5 is a detail side elevation of the electromagnetic escapement for the step-by-step motor, and the circuits, circuit-closer and connections for operating same. Fig. 6 is a detached inverted plan view of the traveling carriage with parts broken away, showing the construction of the several component and co-operating parts.

Like numbers of reference indicate like or corresponding parts throughout the several views of the drawings.

11 indicate, respectively, two curved standards or uprights which serve to support the rear portion of the elevated platform 2, whose front portion is upheld by a similar pair of standards. (Not shown.)

3 is a suitable metallic framework for supporting and securing the several parts of the step-by-step motor, and is attached rigidly to the base (not shown) in the proper relative position for its superincumbent parts to be in operative relation to the rack-bar of the traveling carriage. This framework 3 is of such form and construction as to accommodate itself to its allotted space without interfering in any manner with adjacent parts of the machine.

By reference to Figs. 1, 2, 4 and 5 it will be seen that the step-by-step motor consists, essentially, of a train of wheels comprising a clockwork-movement controlled by an electromagnetic escapement operated intermittently by an automatic closure of an electric circuit at a determinate instant after the impact of a particular letter has been made upon the traveling paper-roll; and it will be also observed by an inspection of Fig. 5 that instead of a detailed illustration of the letter-printing mechanism and the automatic circuit-closing devices a simple circuit-closer is shown as an equivalent construction, for the purpose of clearness.

The train of wheels of the step-by-step motor are set into motion by the large pinion or gear-wheel, which is mounted loosely on the winding-shaft 5 and is provided with a pawl-dog 6, adapted to engage the teeth of the ratchet-wheel 7, which in turn is either keyed rigidly upon the shaft 5 or formed integral with the drum 8, which is also mounted rigidly upon the said shaft 5. The ratchet-wheel 7 is revolved normally by the cord 9, provided with the depending weight 10, as shown clearly in Fig. 2. However, it will be apparent that the equivalent of such construction would be a spring suitably arranged for normally rotating the said drum. The wheel 4 meshes with the small pinion 11, which is mounted rigidly on the shaft 12, which carries the actuating gear-wheel 13 for engag-



ing in the teeth of the rack-bar 14, and for advancing the traveling carriage the distance said gear 13 is allowed to rotate by the release of the electromagnetic escapement, as will be understood from the explanation herein-  
 5 after given. The gear-wheel 13 also meshes with the pinion 15, which is mounted rigidly upon the shaft 16, which in turn carries the scape-wheel 17.

10 18 designates the double-escapement lever, suitably pivoted to a small arbor 19, attached to the frame 3 and carrying the armature 20 of the electromagnet 21<sup>a</sup>, which latter is mounted in the rectangular frame 21 and is  
 15 in circuit with the battery 22 by wire 23, and with one plate of the circuit-closer or spacing-key 24 by wire 25, the other plate of said key being in circuit with the battery by the wire 26.

The bifurcated lever 18 diverges at its upper portion into two pawl-arms 27 and 28, the arm 28 being slightly longer than the arm 27, and is provided with the engaging tooth 29, while the arm 27 is provided with a similar  
 25 tooth on its extremity, with this difference, however, that the tooth on the end of the arm 27 is faced with a spring 30, which is riveted or otherwise attached at its outer end to said tooth, leaving its other end free to exert its tension upwardly or vertically, the object of  
 30 such construction being to provide means for holding the scape-wheel from movement until the tooth 29 has come into engagement with its respective ratchet-tooth. Then by the further movement of the lever 18 the spring 30  
 35 is released from the under side of its respective ratchet-tooth and rises into the position shown in Fig. 5 for engaging the next tooth.

When the circuit is broken and the magnet 21 is thereby de-energized, the lever 18 falls  
 40 back by virtue of the retractile spring 31 into its initial position, and the tooth 29 releases the ratchet-tooth which had been held thereby; and at the same time this takes place the spring 30 approaches the scape-wheel, but, as  
 45 will be seen by reference to the said figure, the spring 30 approaches the scape-wheel in a line above the ratchet-tooth which had been in engagement therewith, thereby allowing the said scape-wheel to rotate until the next  
 50 succeeding tooth on its periphery comes in contact with the spring 30, stopping the rotation thereof until the next electrical impulse passes through the magnet 21, when the operation is repeated.

55 31 designates a suitable retracting-spring attached at one end to the lever 18 and at its other is secured to the adjusting-screw 32, which has its bearing in the vertical plate 33 of the frame 26, this being an ordinary expedient for restoring the escapement-lever to  
 60 its normal position after the circuit to the magnet has been broken and the magnet demagnetized.

It will be obvious that the electro magnetic  
 65 escapement may be operated either upon an open or closed electric circuit.

Referring to Figs. 1, 2, 4, and 6, which illus-

trate in detail the reversing mechanism for the traveling carriage, 34 designates the paper-roll pivotally mounted by the adjusting-  
 70 screws 35 35 in the respective side bars of the traveling carriage, only one of which, 36, is shown. (See Figs. 1, 2, and 6.) Upon one end of the said paper-roll is rigidly secured the ratchet-disk 37, and 38 is a lever pivoted at  
 75 the point 39 to the side bar 36, and having its forward end formed into check-pawl 40, and near the said end carrying the spring-retained actuating-pawl 41, and provided on its rear extremity with the cam-head 42 project-  
 80 ing at right angles to the main body of said lever and under the side bar 36, as shown clearly in Fig. 6. To the rear of the fulcrum-point 39, the main body of the lever 38 is carried upwardly over the rack-bar and down  
 85 until it merges into the cam-head 42, before described.

43 indicates a coiled or spiral retracting-spring attached to a suitable adjusting-screw 44, for restoring the said lever 38 to its nor-  
 90 mal horizontal position after displacement.

On the under side of the side bar 36 of the carriage and opposite to one extremity of the rack-bar 14 is pivoted a small lever-catch 45, having the cam-head 46 on one end, and on  
 95 the side bar are the limiting-stops 47 47 on each side of the other end of the lever-catch to restrict its play beyond a certain point, as will be understood hereinafter. The cam-head 46 of this lever-latch is arranged so as  
 100 to engage to stop 48, which is located at a predetermined point upon the lifting-bar 49, which latter is loosely held in the sleeve 50 at one extremity, and is attached at its other end centrally to the plate or lever 51, which car-  
 105 ries at its upper end the roller 52, and its lower end is pivotally connected to the framework of the machine.

By reference to Figs. 1, 2, and 6 of the drawings, it will be seen that the lifting-bar 49 is  
 110 upon a different horizontal plane from the guide-bar 53 and the rack-bar 14, yet it is curved at the forward end which carries the plate 51, so as to bring the roller 52 in the same vertical plane with the forward end of  
 115 the guide-bar 53, which latter is rigidly mounted at its inner end to the plate or bracket 54, which in turn is pivotally mounted in a rectangular slot formed in the framework of the machine. The forward portion  
 120 of this guide-bar 53 merges at its extreme end into a curved or beveled portion 55, which conforms to and enters into the groove of the roller 52, and near the extreme end of the portion 55 there is an abrupt curve or depres-  
 125 sion 55<sup>a</sup> for a purpose hereinafter explained.

In Fig. 3 is shown a somewhat different manner of constructing the portion 55 of the guide-bar, in which its lower or under edge only is made to conform to the groove of the roller  
 130 52. On the outside of the framework of the machine and in the same vertical plane with the extreme end of the portion 55 of the guide-bar 53 is secured a catch or support-



ing plate 56, which receives and upholds the said end of the guide-bar when the roller 52 is withdrawn from under said guide-bar.

The stop 48 is transversely perforated so as to permit of a longitudinal movement upon the lifting-bar 49, and is provided with a clamping-screw 57 for adjusting the same at any desired point.

58 designates a stop similar in construction to the stop 48, except that one side thereof adjacent to the traveling carriage is beveled or inclined for the purpose of tripping the cam-head 42 of the lever 38 when the carriage reaches the limit of its recoil, as will be hereinafter explained.

59, respectively, designate two antifric-tion-rolls journaled in a suitable frame or bracket 60 carried by the traveling carriage, and said rolls travel, respectively, upon the upper and lower beveled edges of the guide-bar 53 as the carriage travels forward or backward.

Of course it will be apparent that neither the form nor the exact construction of the framework of the traveling carriage, its supporting-platform, or other non-essential parts need be strictly adhered to in practice.

The operation of my invention is as follows, viz: The circuit being closed from battery 22 by the depression of the spacing-key 24 through wires 26, key 24, and wires 23 and 25 to the magnet 21<sup>a</sup>, which, when thus energized, attracts its armature 20, and consequently moves the lever 18 from its normal position, unlocks the escapement and thus permits the free rotation of the spacing gear-wheel 13 for advancing the rack-bar until the magnet 21<sup>a</sup> is de-energized by the release of the operator's finger, when the scape-wheel 17 is again locked by the lever being restored to its normal position by the spring 31. Thus the letter-spacing is continued until the traveling carriage has been advanced in a step-by-step manner to the position shown in Fig. 1, at which point the cam-head 46 of the lever-catch 45 comes into engagement with, and when the carriage is still farther advanced is displaced by stop 48, freeing the cam-head 42 of the lever 38 from the retaining agency of said cam-head 46 until it (the lever 38) drops and rests upon the upper portion of the stop 48. Then as the carriage is further advanced the cam-head 46 is moved aside as far as the limiting-pin 47 will permit, after which time the adjacent edge of the fixed stop 48 offers an obstruction to the progress of the carriage and therefore, as the carriage proceeds still farther, said cam-head, by its travel, will cause the lifting-bar 49 (to which the stop 48 is rigidly screwed) to slide forward out of the sleeve 50 until the plate 51 is lifted up with roller 52 into engagement with the portion 55 of the guide-bar 53. Consequently as the carriage is advanced to its limit of forward travel the roller 52 will follow the under line of the portion 55, and finally encountering

and passing over the curve 55<sup>a</sup> will uplift the guide-bar 53 to its fullest extent, the plate 51 being at this time in a perpendicular position and the rear end of the lifting-bar still in the sleeve 50. Thus when the guide-bar 53 is uplifted the superincumbent carriage is also raised, thereby lifting the rack-bar 14 entirely out of engagement with the gear-wheel 13, and at the same time placing the carriage upon such an incline as will compel its return by gravity without jar or injury.

When the carriage begins to return, the plate 51 still being in a perpendicular position, the cam-head 42 (which, as before stated, has been resting on top of the stop 48) will be carried back until its curved edge comes into engagement with the beveled stop or trip 58, thereby tripping upwardly the rear portion of lever 38, and consequently causing the depression of its forward end and the rotation of the ratchet-disk 37 by the pawl 41, the check-pawl 40 preventing the pawl 41 from rotating the ratchet-disk 37 more than one line-space.

Simultaneously with the engagement of the cam-head 42 with the trip 58 the cam-head 46 comes into engagement with said trip, thereby replacing the lever-catch in its normal position under the cam-head 42, and at the same time this joint operation takes place the slight impetus, due to the return of the carriage against the trip 58, displaces the perpendicular position of the plate 51, and restores the lifting-bar 49 to its normal horizontal position, so that the carriage is ready to proceed for the next line to be printed.

Having thus fully and accurately described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a type-writer, the combination with the rack-bar of a traveling carriage, and a motor for advancing same, of a support upon which the carriage travels pivoted at one extremity and vertically movable at the other, and a lever operated by the movement of the carriage to uplift the free end of said support out of a horizontal plane at a certain point in the travel of said carriage.

2. The combination with the rack-bar of a traveling carriage and a motor for advancing said rack-bar, of a support upon which the carriage travels pivoted at one extremity and movable at the other, of a lever operated by the movement of said carriage to raise said support out of a horizontal plane at a certain point in the line of travel of said carriage, a grooved roller for directly engaging the movable end of said support, and attached to the uplifting agency; and the end of said support shaped to enter in the groove of the roller.

3. The combination with the rack-bar of a traveling carriage and a motor for advancing said rack-bar, of a support upon which the carriage travels pivoted at one extremity and movable at the other, of a lever operated by



the movement of said carriage to raise said support out of a horizontal plane at a certain point in the line of travel of said carriage, a grooved roller for directly engaging the movable end of said support, and attached to the uplifting agency, and the end of said support shaped to enter the groove of the roller and having its extremity in a lower horizontal plane than the other portion of the support.

10 4. The combination with a traveling carriage, a rack-bar carried thereby, and a motor for advancing said carriage of a support upon which said carriage travels pivoted at one extremity and movable at the other, a lever for raising the said support out of a horizontal plane at a certain point in the line of travel of said carriage and a traveling stop arranged to move the lever to raise the said support.

20 5. The combination with a traveling carriage, a support upon which it travels, pivoted at one end, an upright lever provided with a grooved roller at its upper end upholding the other end of the carriage support, a horizontally movable bar connected to the lever and provided with a stop, and a stop

on the carriage arranged to engage the stop on the bar.

6. The combination with a traveling carriage, of a support for the same pivoted at one end, a lever for elevating and lowering the other end of the carriage support, and stops connected with the lever, in the path of the carriage, whereby the lever is actuated by the carriage at the limits of its travel in both directions, substantially as described. 30 35

7. The combination of the traveling carriage provided with the catch-lever 45, of the bar 49, having the stop 48, the lever 51 provided with roller 52 and the guide-bar 53, having the portion 55. 40

8. The combination with the traveling carriage adapted to travel forward and backward, of the bar 49, the lever 51, the roller 52, the guide-bar 53 and the stop 58. 45

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

J. F. McLAUGHLIN.

Witnesses:

THOS. J. HUNT,

GEO. H. TICHENOR.