

No. 844,183.

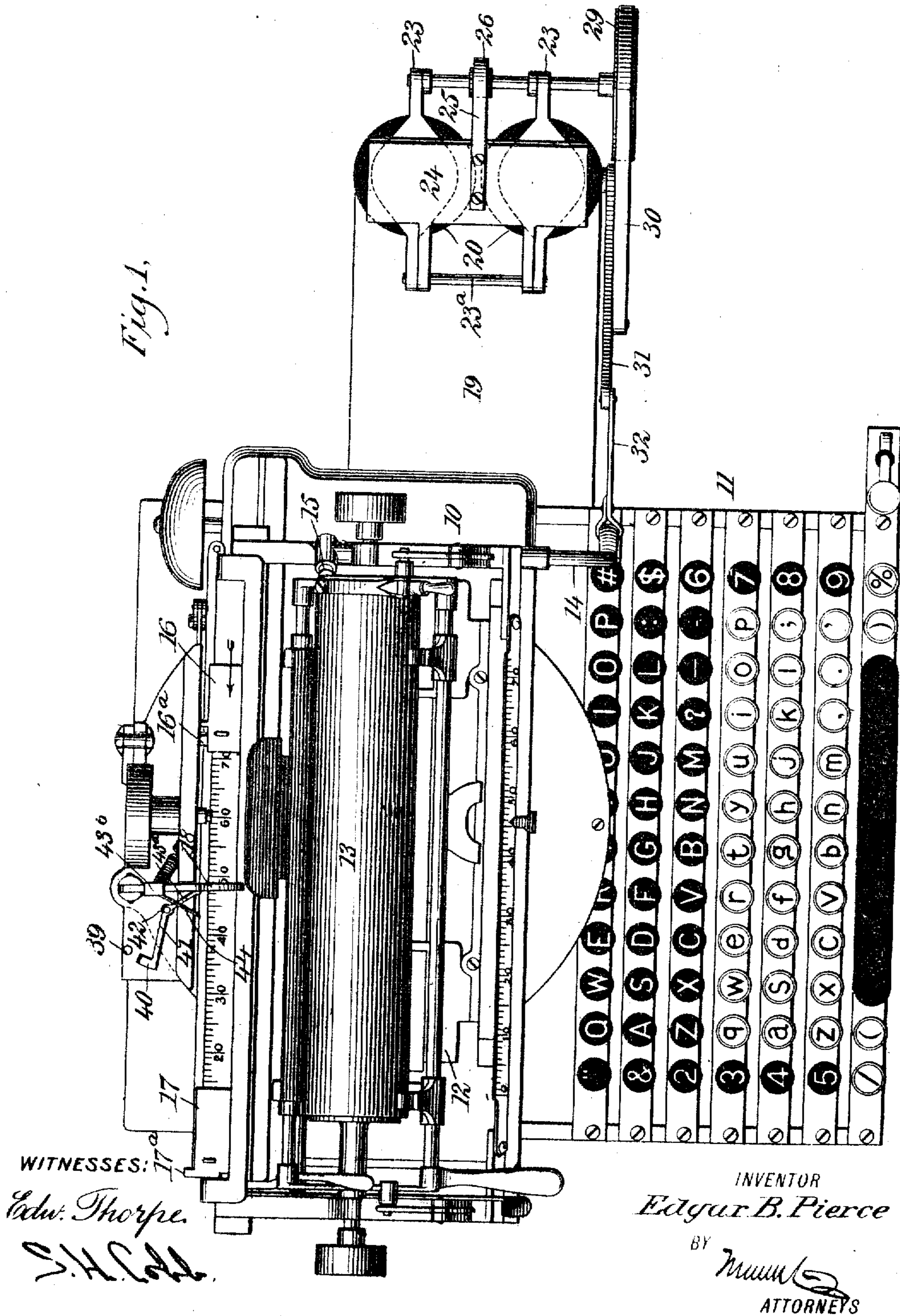
PATENTED FEB. 12, 1907.

E. B. PIERCE.
TYPE WRITER.

APPLICATION FILED JUNE 15, 1904.

3 SHEETS—SHEET 1.

Fig. 1.



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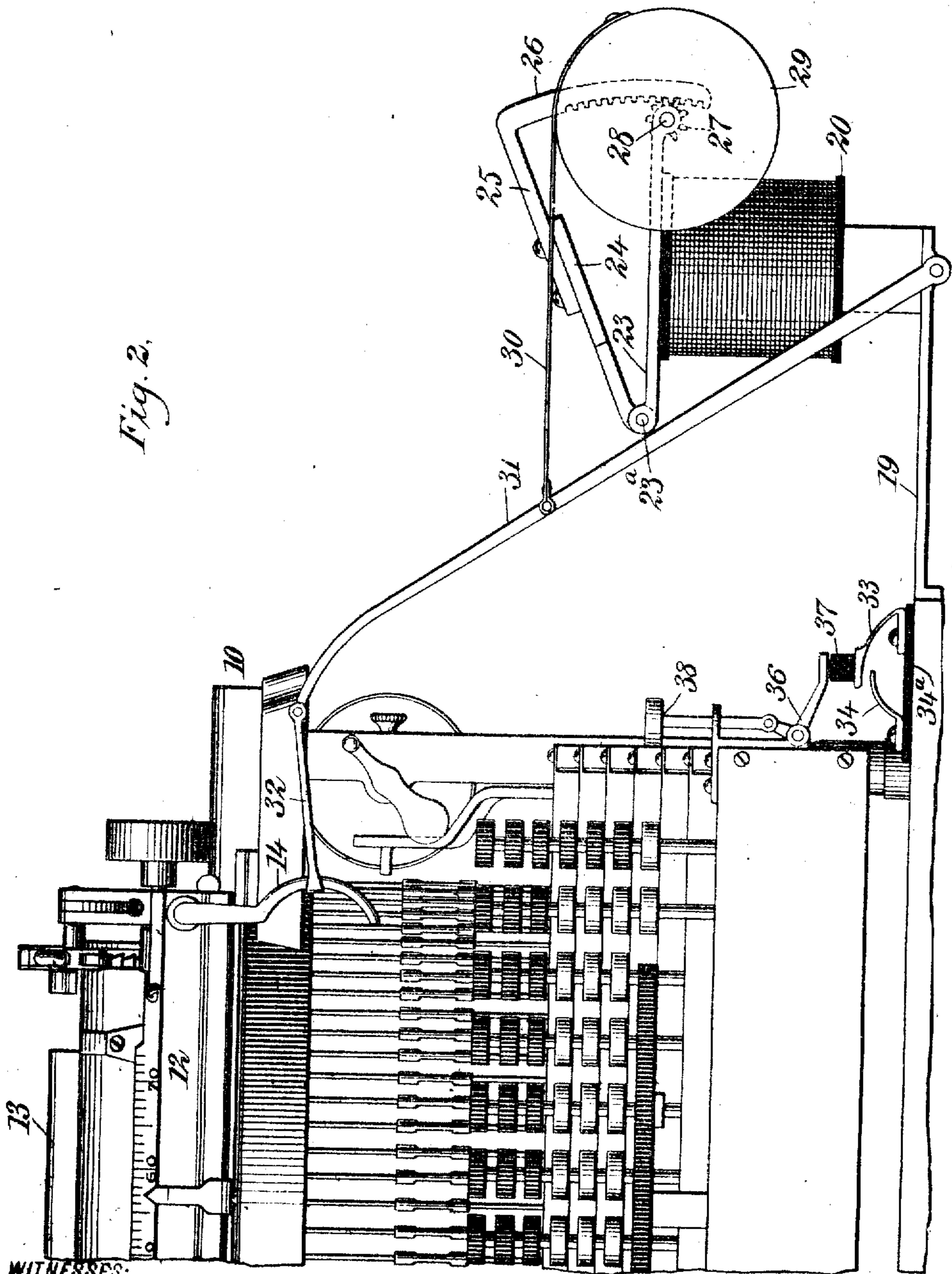
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3 SHEETS—SHEET 2.



WITNESSES:

Edward Thorpe.
S. H. Cobb.

INVENTOR

Edgar B. Pierce

BY

Wm. H. [Signature]

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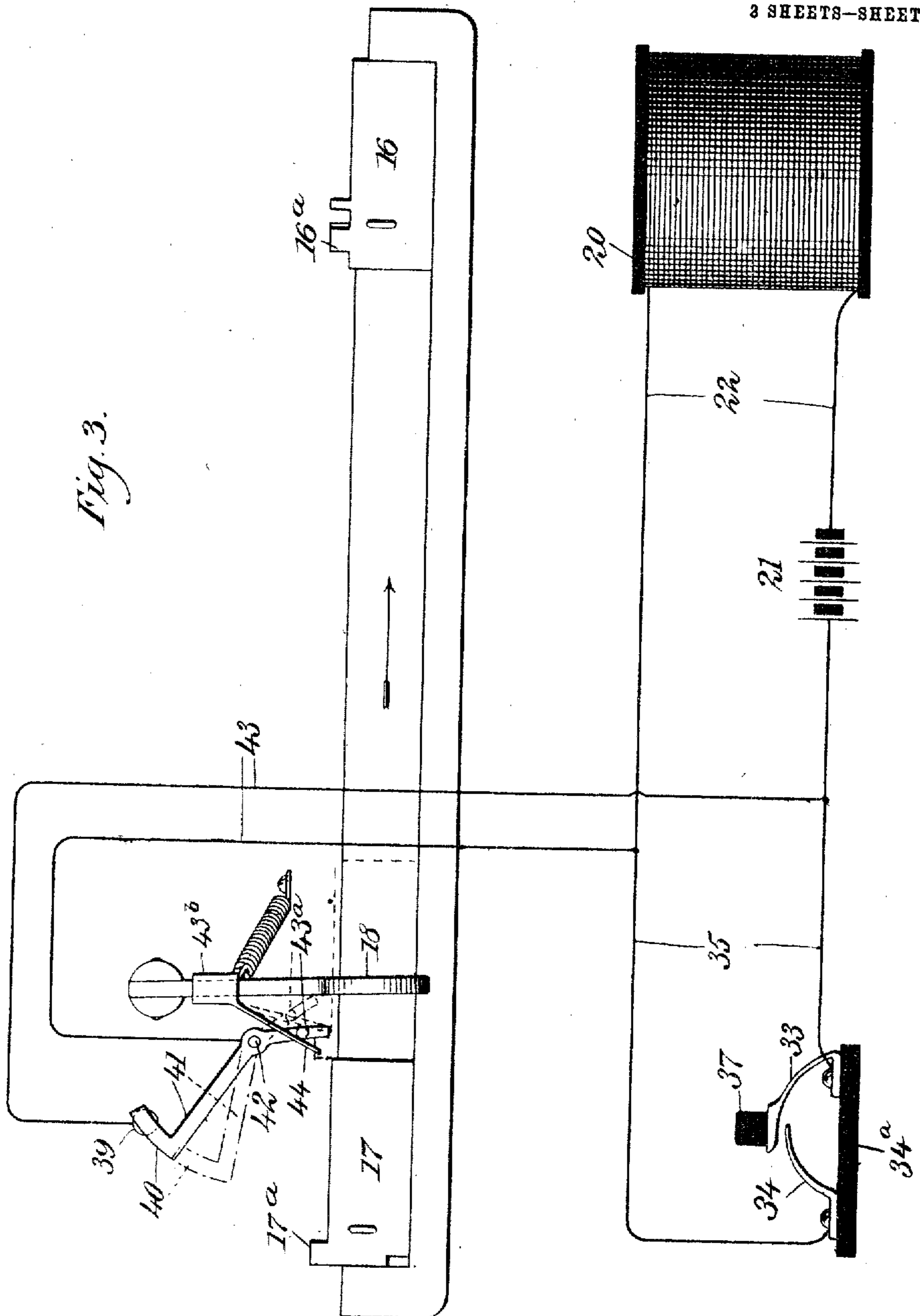
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2 SHEETS—SHEET 3.

Fig. 3.



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UNITED STATES PATENT OFFICE.

EDGAR BELLISLE PIERCE, OF THE UNITED STATES NAVY, ASSIGNOR TO
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TYPE-WRITER.

No. 844,183.

Specification of Letters Patent.

Patented Feb. 12, 1907.

Application filed June 15, 1904. Serial No. 212,601.

To all whom it may concern:

Be it known that I, EDGAR BELLISLE PIERCE, a citizen of the United States, of the United States Navy, and a resident of Alameda, Alameda county, State of California, have invented a new and Improved Type-Writer, of which the following is a full, clear, and exact description.

My invention relates to type-writers, and more particularly to mechanism for returning the carriage to its initial position and for advancing the platen. Its principal objects are to provide means for effecting the reversal and feed, either automatically or manually, with minimum effort on the part of the operator, and in either case to effect this speedily and with little shock upon the machine.

It consists in the various features and combinations hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a top plan view of a type-writer to which one embodiment of my invention is applied. Fig. 2 is an enlarged partial front elevation thereof, and Fig. 3 shows diagrammatically the magnet with the circuits and circuit-closers in connection with a portion of the type-writer.

The numeral 10 designates the frame of one form of type-writer, in connection with which I have chosen to illustrate my invention. This type-writer is provided with a keyboard 11 and a carriage 12, in which operates a platen 13. Associated with the carriage is a line-spacing lever 14, carrying the spacing-dog 15 for coaction with the platen. Mounted upon the carriage are right and left hand margin-stops 16 and 17, having stop projections 16^a and 17^a, respectively. Pivotaly supported upon the frame is a movable member 18, which serves as a stop and locking-lever.

Fixed to the base of the machine, preferably at the right thereof, is a bracket 19, carrying at its outer end an electromagnetic device, which is here shown as a double-pole electromagnet 20. The winding of this magnet will depend upon the source of the electrical energy which is supplied to it, this being in the present instance indicated in Fig. 3

of the drawings as a series of cells 21, comprised in a circuit 22. These may be either primary or secondary elements, or the magnet may be connected with a lighting or power circuit, either alternating or direct. Near the magnet, preferably upon the upper side thereof, are mounted brackets or supporting-bars 23 23, formed of non-magnetic material and carrying, swinging upon a rod 23^a at one extremity, an armature 24. From the opposite side of this armature projects an arm 25, preferably of brass or other non-magnetic material, having at its outer end a depending segmental rack 26, meshing with a pinion 27, fast upon a shaft 28. This shaft is journaled in the outer ends of the brackets 23 and has fixed to it a roll 29, to the periphery of which is secured a flexible member or band 30, which may be conveniently formed of thin metal. The inner end of this band is fastened to a lever 31, here shown as fulcrumed upon the bracket 19 beneath the magnet and connected at its upper end to the spacing-lever by a link 32.

The relation of the throw of the armature and its rack to the number of teeth upon the pinion and the diameter of the roll is such that upon the energizing of the magnet to draw down its armature the winding of the band about the roll will move the carriage from its extreme left-hand to its initial position with a constantly-exerted force and at the same time will throw sufficient tension upon the spacing-lever to rotate the platen through the coacting dog and advance the work to the next line. The completion of the normally open magnet-circuit 22 to effect this result may be accomplished by a contact device or circuit-closer consisting of spring members 33 and 34, suitably mounted upon an insulating-base 34^a, adjacent to the keyboard and connected with the magnet-circuit by leads 35. This circuit-closer may be operated by a bell-crank lever 36, fulcrumed upon the frame of the type-writer and cooperating at one end with a head 37, carried by the upper contact member 33, while its opposite end is articulated to a key 38, adjacent to the bank of keys of the machine. This manually-operated circuit-closer enables the carriage to be reversed and the platen rotated from any point of its travel. When the last character of the last word of a line falls upon the graduation next

to the right-hand margin-stop, this reversal and feed may be accomplished automatically, and for this purpose a circuit-closer is provided consisting of a fixed contact member 39, secured to the frame of the machine, with which coacts a movable contact member 40, carried by a lever 41, conveniently fulcrumed upon a pin 42, rising from the frame. These two members are connected with the magnet-circuit through leads 43, joining this circuit-closer in parallel with the manually-operated device. The contact member 40 is situated adjacent to the locking-lever 18 and in its path. From the arm of the lever 41 projects a pin 43^a, and upon the locking-lever is a collar 43^b, from which extends a spring-arm 44 at the other side of the pin 43^a from the lever and adapted to contact therewith. The lever 18 moves in a recess in the frame of the machine and when in normal position bears against the wall 18^a at the right-hand side of the recess, which thus forms a stop for the lever. A coil-spring 43^c is connected with the lever 18, the spring yielding to permit the lever to be moved toward the left by the carriage and returning the lever to its normal position when the carriage starts on its return movement to the right.

As the carriage approaches the termination of its movement toward the left the stop projection 16^a contacts with the lever 18 and moves it before it against the tension of the spring 43^c. As the end of the lever 41 is resting against this locking-lever the former lever is swung upon its fulcrum, and when the carriage has reached the end of its travel the contact members 39 and 40 will come into coaction. This closes the circuit through the magnet, attracting the armature, which moves directly toward the faces of the magnet-poles in the general direction of the lines of force and through the connecting means drawing back the carriage to its extreme position at the right and simultaneously swinging the spacing-lever to advance the platen. As the attraction of the magnet for its armature, and consequently the velocity imparted thereto and to the carriage, will increase as the armature approaches the poles, it is necessary that some provision be made to check the increasing momentum to avoid severe concussion when the carriage reaches a stop at the right of the machine. This is effected by the contact of the stop projection 17^a with the spring 44, which furnishes a cushion. This spring will be allowed sufficient yield so that even if the margin-stop is adjusted for the first graduation there will still be a sufficient depression before the stop ordinarily set in the carriage-track is reached to furnish the proper yield. As the spring is moved to the right by the stop projection 17^a it contacts with the pin 43^a and moves it before it, so that at the end of the

reverse travel of the carriage the contact members 39 and 40 will be separated and the lever will assume a position indicated in dotted lines in Fig. 3 of the drawings, at which it is ready for coaction with the locking-lever upon the completion of the line.

It will be understood that when the carriage moves to the left and the lever 41 is swung by the movement of the lever 18 to move the member 40 into engagement with the fixed contact member 39 the lever 41 remains in this position until the spring-arm 44 is moved against the pin 43^a by the stop projection 17^a. When the carriage starts on its return movement it disengages the lever 18, and the latter is returned to its normal position by the tension of the spring 43^c. The lever 18 in returning to its normal position is not moved sufficiently to cause the spring-arm 44 to bear on the pin 43^a, and consequently the spring-arm has no tendency to move the lever 41 and open the circuit until the said spring-arm is moved by the stop projection 17^a.

It will be seen that by the employment of my improved mechanism the reversal of the carriage and the feed of the platen are accomplished instantly either at the will of the operator in any position or automatically at the end of the line and that the typist is relieved of the necessity of removing the fingers from the keyboard and is therefore enabled to operate with much greater facility and at vastly increased speed. Moreover, the shock and consequent deterioration of the machine incident to the ununiform and often violent drawing back of the carriage by hand is entirely eliminated, any jar which does occur being absorbed by the yield of the spring.

Although for the purpose of describing my invention I have shown it as applied to a specific type of machine, it will be evident that it may be adapted to any other form, and it is therefore to be understood that changes directed to this end are within the scope of my invention.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination with a type-writer frame, a carriage movable thereon, and a bracket secured to the frame, of an electromagnet carried by the bracket, an armature for the magnet pivoted at one side thereof, a segmental rack carried by the armature, a pinion meshing with the rack, a roll rotatable with the pinion, a lever fulcrumed at its lower end on the bracket carrying the electromagnet and connected at its upper end by a link with the carriage, and a band secured to the roll and connected with the lever between its ends.

2. The combination with a type-writer frame, a type-writer carriage, and its spacing-

lever, and a bracket secured to the frame, of an electromagnet carried by the bracket, an armature for the magnet pivoted at one side thereof, a segmental rack carried by the armature, a pinion meshing with the rack, a roll rotatable with the pinion, a lever fulcrumed at its lower end on the bracket carrying the electromagnet and connected at its upper end by a link with the spacing-lever, and a flexible band secured to the roll and connected with the lever between its ends.

3. The combination with a type-writer frame and a carriage movable thereon, of an electromagnetic device acting upon the carriage; an energizing-circuit for the electromagnetic device, a contact device comprising a fixed contact member and a movable contact member included in the circuit and carried by the frame, and a spring operated by the carriage and movable against the movable contact member to move the same to open the circuit.

4. The combination with a type-writer frame and a carriage movable thereon, of an electromagnetic device acting upon the carriage, an energizing-circuit for the electromagnetic device, a contact device comprising a fixed contact member and a movable contact member included in the circuit and carried by the frame, and a spring movable by contact with the carriage into coaction with the movable contact member to move the same to open the circuit.

5. The combination with a type-writer frame and a carriage movable thereon, of an electromagnetic device acting upon the carriage to cause a reversal of the same, an energizing-circuit for the electromagnetic device, a contact device comprising fixed and movable members included in the circuit and carried by the frame, means controlled by the carriage for closing the circuit and a spring movable by the carriage into coaction with the movable contact member to open the circuit.

6. The combination with a type-writer frame, its carriage, a movable member cooperating with the carriage and movable from its normal position in one direction thereby, and means for preventing said movable member from being moved from the normal position, in the opposite direction, of an electromagnetic device acting upon the carriage, an energizing-circuit for the electromagnetic device, a spring carried by the movable member, and a contact device coacting with the movable member, and with the spring.

7. The combination with a type-writer frame, its carriage, and a movable member cooperating with the carriage and movable from its normal position in one direction, and a stop engaged by said member when in the normal position, of an electromagnetic device acting upon the carriage, an energizing-circuit for the electromagnetic device, a

spring carried by the said movable member, and a contact device coacting with the movable member upon the forward movement of the carriage and with the spring upon the rearward movement of said carriage.

8. The combination with a type-writer carriage, and a member movable thereby, of automatic means for reversing the carriage controlled by said movable member, a spring mounted upon the movable member and with which the carriage contacts upon its reversed movement, and means for holding the said member against movement when the carriage contacts with the spring.

9. The combination with a type-writer carriage, of an electromagnet and its armature, means for energizing the magnet, and connecting means between the armature and carriage whereby said armature when attracted by the magnet exerts a continuous force accomplishing a reversal of the carriage, the said connecting means comprising a rack moving with the armature, a pinion meshing with the rack, a roll rotatable with the pinion, a lever fulcrumed at one end to a bracket carrying the magnet and connected at its other end by a link with the carriage, and a flexible band secured to the roll and connected with said lever between its ends.

10. The combination with a type-writer frame, a carriage movable thereon, and a movable member comprising a lever pivotally supported upon the frame, of an electromagnet and its armature, means for energizing the magnet, connecting means between the armature and carriage whereby said armature when attracted by the magnet exerts a continuous force accomplishing a reversal of the carriage, a spring mounted upon the movable member and with which the carriage contacts, for yieldingly arresting the reversed movement of the carriage, and means for holding the lever against movement when the carriage contacts with the spring.

11. The combination with a type-writer carriage, the platen operating therein, and the spacing-lever carrying the spacing-dog for coaction with the platen, of an electromagnet and its armature, means for energizing the magnet, a rotatable device, an arm on the armature provided with means for directly actuating the rotatable device, a lever fulcrumed at its lower end on a bracket carrying the electromagnet and connected at its upper end by a link with the spacing-lever, and connecting means between the rotatable device and the said lever, whereby the armature when attracted by the magnet, exerts a continuous force to accomplish a reversal of the carriage and a rotation of the platen.

12. The combination with a type-writer frame and a carriage movable thereon, of an electromagnetic device acting upon the car-

riage, an energizing-circuit for the electromagnetic device normally open, a contact device comprising a fixed and a movable contact member included in the circuit and carried by the frame, a movable member comprising a lever pivoted on the frame and coacting with the movable contact member upon the forward movement of the carriage to move said contact member in one direction, and means coacting with the movable contact member upon the rearward movement of the carriage to move said contact member in the opposite direction.

13. The combination with a type-writer frame, and a carriage movable thereon, of an electromagnetic device, connecting means between the electromagnetic device and the carriage to cause a reversal of the carriage when the electromagnetic device is energized, an energizing-circuit for the electromagnetic device normally open, a contact device comprising a fixed and a movable contact member included in the circuit and carried by the frame, a movable member comprising a lever pivoted on the frame and coacting with the movable contact member upon the forward movement of the carriage to move said contact member to close the circuit, means coacting with the movable contact member upon the rearward movement of the carriage to move said contact member to open the circuit, and manually-operated means for applying the current.

14. The combination with a type-writer frame, and a carriage movable thereon, of an electromagnetic device connected with the carriage to act thereon, an energizing-circuit for the electromagnetic device normally open, means for controlling the application of the energizing-current to the electromagnetic device operable through the movement of the carriage and comprising a fixed and a movable contact member included in the circuit and carried by the frame, a movable member comprising a lever pivoted upon the frame and coacting with the movable contact member upon the forward movement of the carriage to move said contact member to close the circuit, and a spring-arm carried by the lever and coacting with the movable contact member upon the rearward movement of the carriage to move said contact member to open the circuit, and manually-operated means for applying the current.

15. The combination with a type-writer frame and a carriage movable thereon, of an electromagnetic device acting upon the carriage, an energizing-circuit for the electromagnetic device, a contact device comprising a fixed and a movable contact member included in the circuit and carried by the frame, a movable member comprising a lever pivotally supported upon the frame, a spring for returning the lever to normal position, a stop projection on the carriage for

engaging the lever upon the forward movement of the carriage to move the same against the tension of the spring, the said lever when moved against the tension of the spring actuating the movable contact member to close the circuit, a spring-arm carried by the said lever and adapted to engage the movable contact member to move the same to open the circuit upon the rearward movement of the carriage, the carriage having a stop projection for engaging and moving the said spring-arm, and means for holding the lever against movement when the carriage contacts with the spring-arm.

16. The combination with a type-writer carriage, a member movable in the forward direction by the forward movement of the carriage, means for returning said member to normal position, and a stop for the member when in normal position, of automatic means for reversing the carriage controlled by the movable member, and a spring mounted upon the said member and with which the carriage contacts upon its reversed movement.

17. The combination with a type-writer frame and a carriage movable thereon, of an electromagnetic device, connecting means between the electromagnetic device and the carriage to cause a reversal of the carriage when the electromagnetic device is energized, an energizing-circuit for the electromagnetic device normally open, a contact device included in the circuit, means actuated by the carriage on its forward movement and coacting with the contact device to move the same to close the circuit, means actuated by the carriage on its rearward movement and coacting with the contact device to move the same to open the circuit, and manually-operated means for applying the current.

18. The combination with a type-writer carriage, its platen and spacing-lever, of an electromagnetic device, a connection between the electromagnetic device and the spacing-lever, whereby when the electromagnetic device is energized a continuous force is exerted on the spacing-lever to reverse the carriage and rotate the platen, an energizing-circuit for the electromagnetic device, a member movable by the carriage in the forward direction, but held from movement in the opposite direction when in normal position, a contact device coacting with the movable member, upon the forward movement of the carriage, to close the circuit, a spring carried by said movable member and with which the carriage contacts upon its reversed movement, the said spring coacting with the contact device to open the circuit.

19. The combination with a type-writer carriage, the platen operating therein, and the spacing-lever carrying the spacing-dog for coaction with the platen, of an electro-

magnet and its armature, a connection between the armature of the electromagnet and the spacing-lever whereby when the electromagnet is energized a continuous force is exerted on the spacing-lever to reverse the carriage and rotate the platen, an energizing-circuit for the electromagnet, normally open, a member movable by the carriage in the forward direction, but held from movement in the opposite direction when in normal position, a contact device coacting with the movable member upon the forward movement of the carriage to close the circuit, a spring carried by said movable member and with which the carriage contacts upon its reversed movement, the said spring coacting with the contact device to open the circuit, and manually-operated means for applying the current.

20. The combination with a type-writer frame, a carriage movable thereon, a movable member supported on the frame, and a stop for said member when in its normal position, of automatic means for reversing the carriage controlled by said movable member, and means carried by the movable member for yieldingly arresting the reversed movement of the carriage.

21. The combination with a type-writer frame, a carriage movable thereon, and a movable member supported by the frame, of an electromagnetic device acting upon the carriage to reverse the same, an energizing-circuit for the electromagnetic device, means

controlled by the movable member for applying the energizing-current to the magnet, a spring mounted upon said movable member and with which the carriage contacts upon its reversed movement, thereby yieldingly arresting the reversed movement of the carriage, and means for holding the member against movement when the carriage contacts with the spring.

22. The combination with a type-writer frame, a carriage movable thereon, a movable member comprising a lever pivotally supported on the frame, and a stop for said lever when in its normal position, the said lever being operated by the carriage on its forward movement, of an electromagnetic device acting upon the carriage to reverse the same, an energizing-circuit for the electromagnetic device, normally open, means controlled by the said lever for applying the energizing-current to the magnet, means carried by the lever for yieldingly arresting the reversed movement of the carriage, and manually-controlled means for applying the current.

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

EDGAR BELLISLE PIERCE.

Witnesses:

H. C. CURL,
C. S. FREEMAN.