

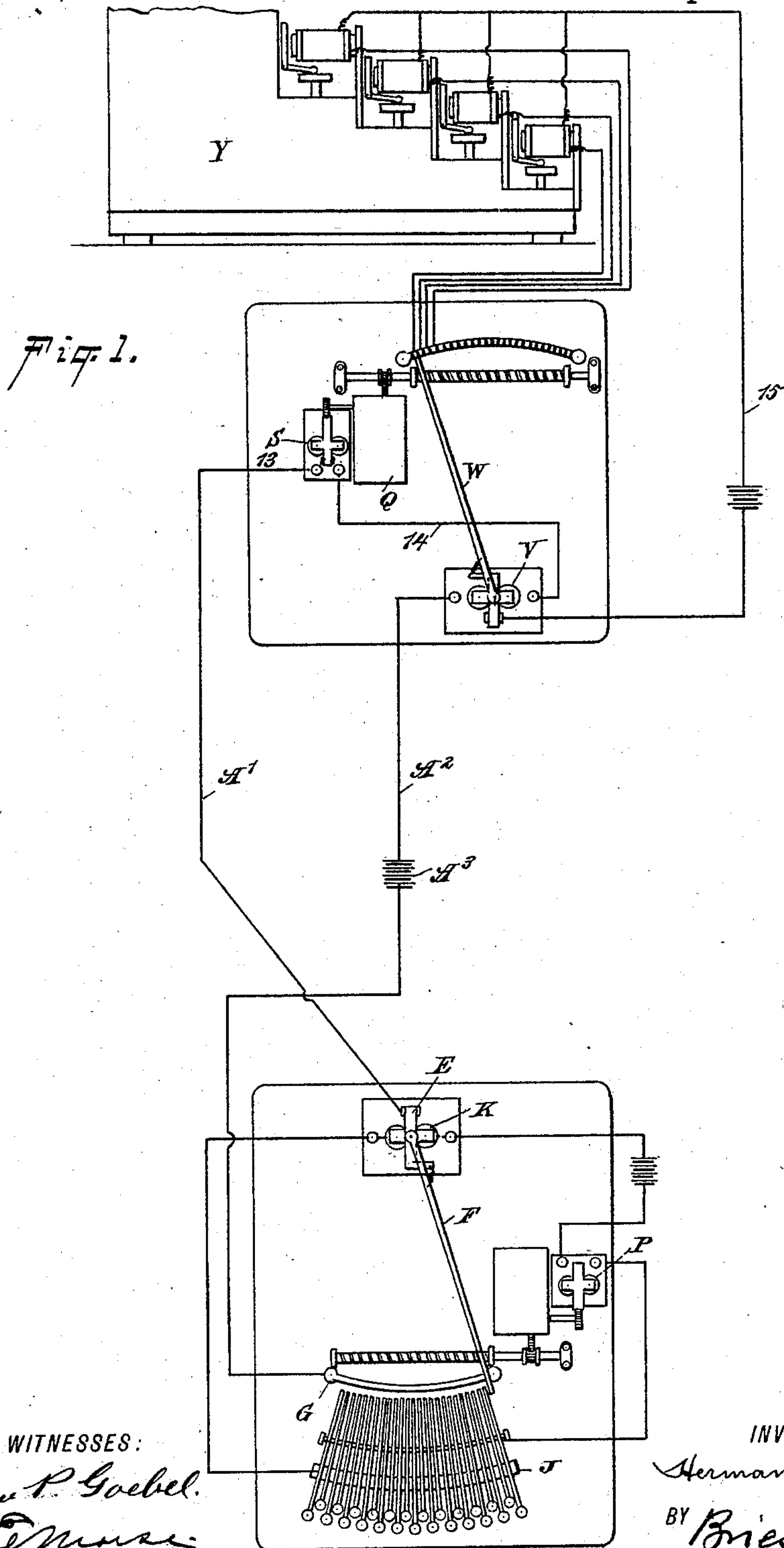
(No Model.)

4 Sheets—Sheet 1.

H. KREUSLER.
PRINTING TELEGRAPH.

No. 580,617.

Patented Apr. 13, 1897.



WITNESSES:

William P. Goebel.
Geo. C. Morse.

INVENTOR

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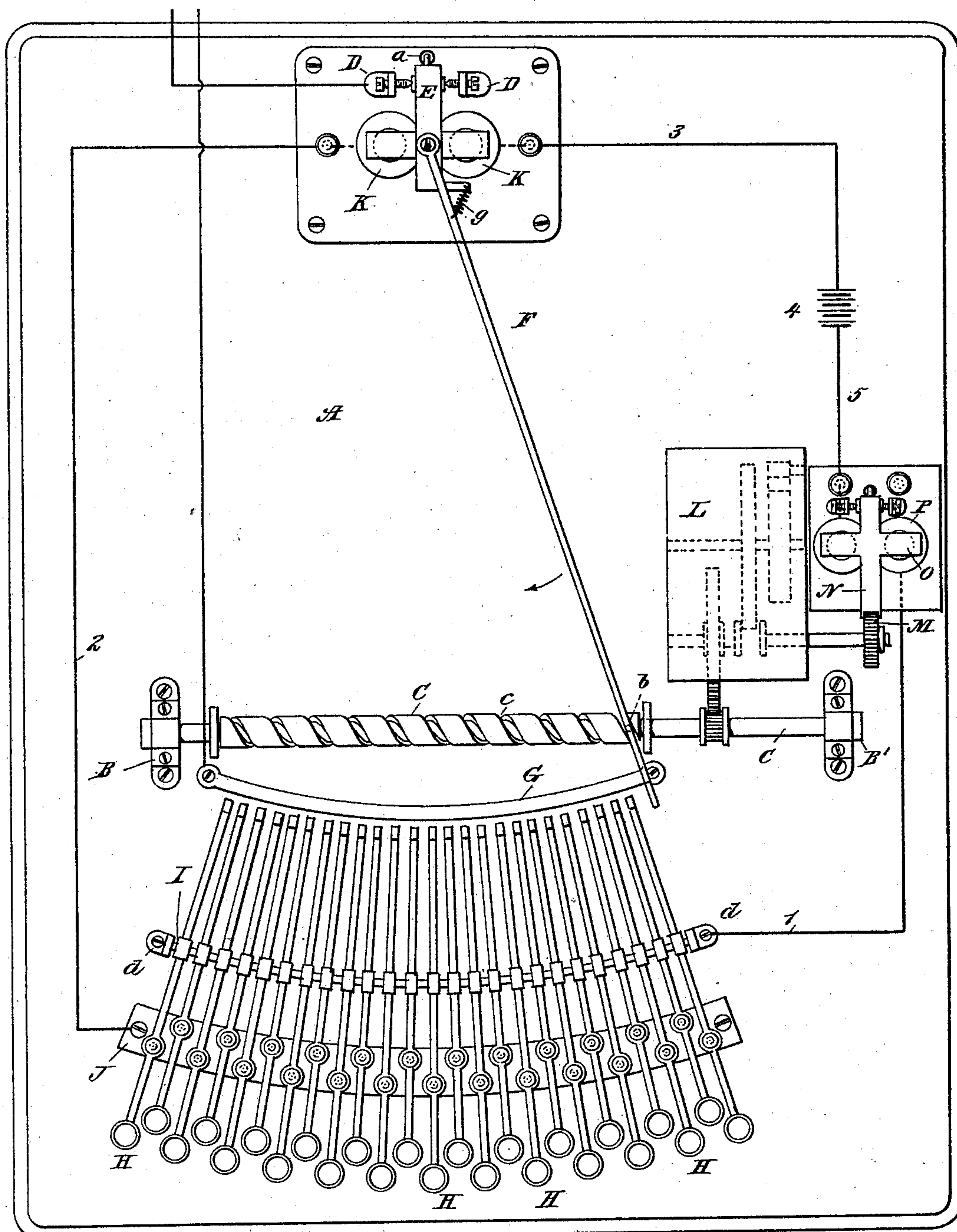
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Fig. 2.

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BY

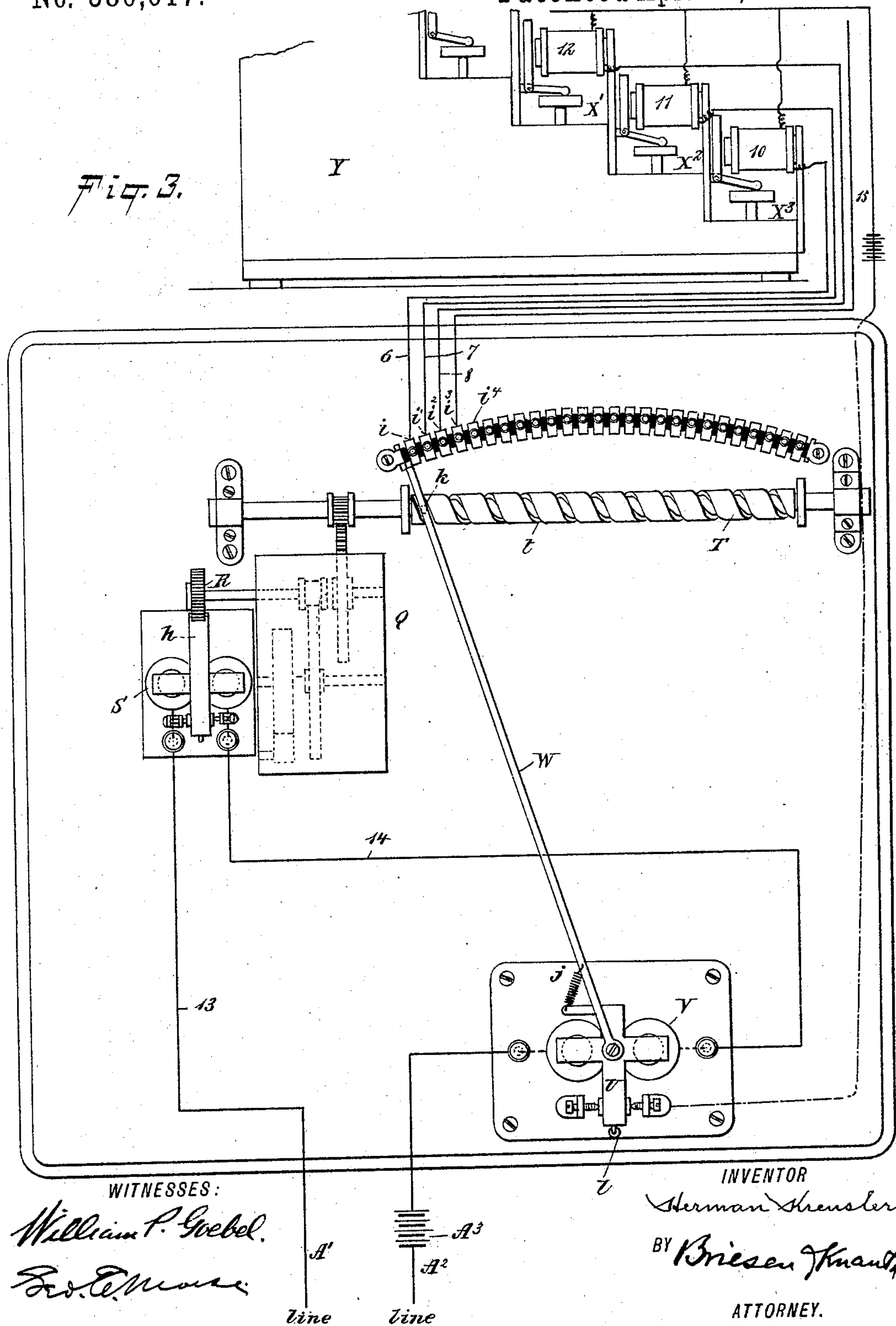
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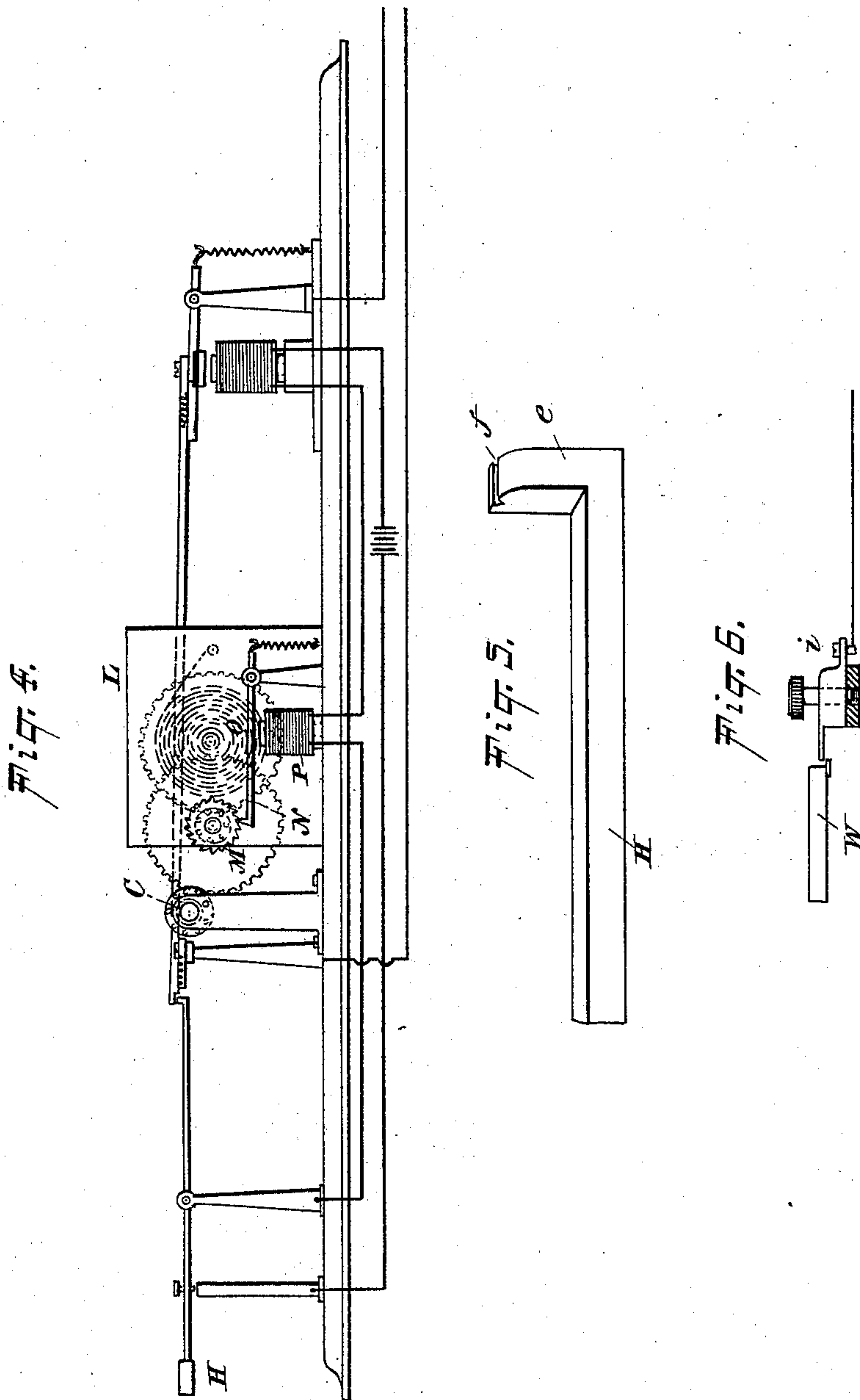
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H. KREUSLER.
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UNITED STATES PATENT OFFICE.

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PRINTING-TELEGRAPH.

SPECIFICATION forming part of Letters Patent No. 580,617, dated April 13, 1897.

Application filed March 6, 1896. Serial No. 582,024. (No model.)

To all whom it may concern:

Be it known that I, HERMAN KREUSLER, a resident of Kreischerville, Richmond county, State of New York, have invented a certain new and Improved Printing-Telegraph, of which the following is a specification.

My invention relates to printing-telegraphs, and more especially to that class of telegraphs wherein the marking or printing is done by means of an instrument actuated or moving synchronously with a transmitting instrument.

My invention consists in the construction hereinafter set forth and claimed.

My invention will be understood by referring to the accompanying drawings, in which—

Figure 1 is a general diagrammatic view of apparatus embodying my invention, showing the circuit connections in detail. Fig. 2 is a detail diagrammatic plan view of a transmitting apparatus embodying my invention. Fig. 3 is a detail diagrammatic plan view of a receiving apparatus embodying my invention and corresponding to and capable of operation in conjunction with the transmitter shown in Fig. 2. Fig. 4 is a detail side elevation of the transmitter, showing also the circuit connections. Fig. 5 is an enlarged detail view of the rear end of one of the keys of the transmitter-keyboard. Fig. 6 is an enlarged detail view showing a pair of the co-operating contacts of the receiver, the same forming the circuit-closer of the top lever-magnets.

Stated generally, the apparatus illustrated consists of a transmitter comprising a keyboard and a transmitting-arm, which transmitting-arm controls the line-circuit, in which is placed a receiver having a similar traveling arm which controls the local circuit of a suitable type-writer or mechanical-writing machine. These transmitters and receivers may be placed upon the line in various numbers and variously arranged, but the preferable mode of connecting and arranging them is shown in Fig. 1.

Before proceeding to describe the general system I will now describe the transmitter and the receiver separately and will then describe their connections and conjoint action.

Referring particularly to Figs. 2, 4, and 5,

which, as I have before stated, illustrate a transmitter embodying my invention, A is a suitable base from which rise bearings B B', which carry a worm or screw shaft C. Rising also from the base are standards D, in which an armature E is pivoted and to which a restoring-spring *a* is connected. The armature E carries pivoted thereto (to swing in a substantially horizontal plane) an arm F, which is the transmitting-arm, and is provided with a bowl *b*, entering a helical groove *c* in the worm or screw shaft C and coöperating with a contact-arc G, also mounted upon the base-board. Series of keys H are pivotally mounted in proximity to the contact-arc G, the said keys being shown as pivoted to a curved rod I, mounted in brackets *d*, rising from the base-board and coöperating with a contact-plate J, above which they are suspended. The keys converge and their inner ends are adapted to arrest the arm F as it moves. Referring now to Fig. 5, which shows the rear end of one of these key-levers H, we note that the rear end is provided with an upturned tang *e*, which tang is shown as inclined at its top and provided with a notch *f*. These keys, which are shown as converging toward the contact-arc G, have their rear ends in such close proximity thereto and to the path of travel of the end of the arm F as to coöperate with the end of the swinging arm F, as will more fully hereinafter appear. Magnets K are mounted upon the base-board beneath the pivoted armature E and serve to swing the said armature and its horizontally-swinging contact-arm up and down, the said armature being connected with the said arm by a pivotal connection and also by means of a restoring-spring *g*. The driving means for the worm-shaft C is constituted by a spring-motor L, which is provided with a control-wheel M, governed by a pivoted detent N, to which an armature O is fastened, magnets P upon the base-board serving to control the said armature. In lieu of the spring-motor and detent apparatus other driving means may be used. The magnet P, as well as the magnet K, is in the present instance controlled by a local circuit manipulated through the keyboard. This local circuit is shown as consisting of a wire *l*, which connects with the said magnet and with the rod I, which is in common electrical connec-

tion with the keys H, each of which forms during the normal state of a transmitter one pole of the local circuit, the other pole being constituted by the contact-plate J, from which the wire 2 leads to the magnet K, the said magnet K being connected to the battery 4 by a wire 3, the opposite pole of the battery being connected by a wire 5 with the magnet P, so that when a key is depressed we have a circuit from the battery by wire 5, magnet P, wire 1, rod I, key H, plate J, wire 2, magnet K, and wire 3 back to the battery. The effect of the passage of the current will be to release the detent N from the control-wheel M and swinging the armature E downwardly. The effect of releasing the control-wheel will be to start up the motor K, which, driving the worm-shaft C, will swing the rod F (whose bowl has been entered into the groove of the shaft by the swing of the armature E) in the direction of the arrow.

The receiving end of the circuit is shown in Fig. 3, to which reference is now invited. In this figure, Q is a motor having a control-wheel R, which is controlled by a detent carried upon a pivoted armature *h* under the influence of a magnet S. This motor serves to drive a worm-shaft T, which is located in proximity to a receiving-table of contacts shown as a series of insulated contact-points *i i' i² i³ i⁴*, &c. Pivoted upon a vertically-swinging armature U, which is controlled by a magnet V, is an arm W. This arm is pivoted to swing in a horizontal plane and is connected with a restoring-spring *j*, which serves to restore it to its initial position, and is also provided with a bowl *k*, which enters the groove *t* in the worm-shaft. This arm is adapted for coöperation with the contact-points *i i' i²*, &c., before referred to and is swung along the path formed by the said contact-points when the motor Q is operated. The magnets S and V are in the line-circuit and are actuated by the same impulse, the magnet S operating to release the detent *h* from the control-wheel R, whereupon the motor starts up, and the magnet V operating to swing the armature U and arm W downward to enter the bowl *k* into the groove *t* in the worm-shaft T, so that as soon as the circuit of the magnets S and V is closed the arm W will be swung upon its vertical pivot. This arm will not, however, contact with the contact-points *i*, &c., until the circuit of the magnets S and V is broken, for the arm travels below the contact-points, as will be seen in the detail side view, Fig. 6. As soon, however, as the circuit of the magnets S and V is broken the motor will cease to operate and the armature U will swing upward, carrying the arm into contact with one of the contact-points, thereby touching the contact-point which the arm may be opposite at the moment of the breaking of the circuit, the said arm being of such a length as to just touch the contact-point as it rises past the same.

The arm is raised by the restoring-spring *l*

above the level of the contact-points and is guided in its upward movement by the bowl *k* working against the edge of the groove in the worm-shaft, the said bowl being of such length as to remain in contact with the groove until the arm has touched and has been raised above the level of the contact-point which it may be opposite, when the bowl passes out of the groove and the spring *j* is permitted to swing the arm back to its initial position. The said swing takes place above the level of the contact-points and out of contact therewith by reason of the fact that the bowl does not leave the groove until the end of the arm is at a greater height than the level of the contact-points, so that the arm will contact only with the point which it is opposite at the moment that the arm is raised by the spring *l*. These contact-points are connected by wires 6 7 8 with magnets 10 11 12, and so on, *ad libitum*, which magnets control keys or type-operating parts *X' X² X³* of a suitable mechanical-writing-machine Y.

It will thus be observed that various manipulations of this writing-machine may be effected by regulating the stoppage of the arm W, which is the receiving-arm, in front of any predetermined contact-point.

Referring now to Fig. 1, we have the general arrangement of circuits and apparatus. In this figure it will be noted that the line-wire *A'* is connected to the wire 13, which connects with the magnet S, which magnet S is connected with the magnet V by wire 14, the magnet V being connected to the line-wire *A²*, in which the battery *A³* is interpolated and which is connected to the contact strip or rail G of the transmitter, the line-wire *A'* being connected to the armature E of the magnet K, so that as soon as the magnet K is operated to bring the arm F into contact with the contact-rail G the circuit will be closed through the magnets S and V. As before mentioned, the closing of the circuits through these magnets will have the effect of starting up the motor and driving the arm W through the medium of the worm-shaft T. As long as the circuit is closed, which will be as long as the arm F contacts with its rail, the arm W will continue to move, and the motors L and Q being synchronous motors the arms will be driven at the same rate of speed and will consequently, in the apparatus shown, traverse equal spaces.

It will be observed, therefore, that by controlling the extent of the horizontal swing of the arm F the extent of swing of the arm W may be very exactly controlled, so as to produce the desired effects upon the writing-machine Y, which effects may, as before stated, be of various kinds, the magnets being connected, as before pointed out, to the separate insulated contact-points *i, i', i²*, &c., and being provided with a common return 15, which is electrically connected with the arm W, so that the arm W will close the circuit of any magnet by touching the contact to which the

said magnet is connected. The keys of the keyboard regulate the distance of travel of the arm F—that is to say, by depressing a key a local circuit is closed, by which the arm is engaged with its propelling worm-shaft and carried along thereby, the arm W following the movements of the arm F until the end of the arm F comes in contact with the tang *e* of the key H, when it will ride up the incline thereof and be thereby elevated from contact with the arc G, breaking the controlled circuit of the arm W and bringing the said arm to rest, the notch *f* engaging the arm to prevent a retrogression thereof until the key H is released, whereupon the restoring-springs *g* and *a* will restore the arm F to its initial position, the arm W being restored by its restoring-springs *j* and *l*. These manipulations may be repeated as often as desired.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A telegraphic transmitter comprising a swinging arm, a keyboard, a screw-shaft for swinging the arm, a local circuit controlled by the keyboard for controlling the arm, the keys of the keyboard being so located as to arrest the motion of the arm.

2. A multiple-signal transmitter comprising a keyboard, an arm cooperating with the keyboard, a magnet provided with a pivoted armature, the said arm being pivoted upon the armature of the magnet at right angles to the pivotal axis of the armature, combined with a worm-shaft for driving the arm, and a motor for driving the worm-shaft.

3. In a printing-telegraph, the combination of a writing-machine having type-actuating keys, a plurality of electromagnets for actuating the said keys, a plurality of contact-points insulated from each other and each connected in circuit with a key-actuating electromagnet, a driven worm-shaft, a contact-arm for engaging with the contact-points, the said contact-arm being driven by the worm-shaft and means for interrupting the movement of the worm-shaft-driving mechanism and a transmitter for operating the said interrupter.

4. In a printing-telegraph, the combination

of a writing-machine, electromagnetic means for operating the writing-machine, a receiving-arm for controlling the electromagnetic operating means for the writing-machine, a power-driven worm-shaft for moving the said arm, a transmitter-arm, a worm-shaft for moving the said arm, and a plurality of keys for interrupting the movement of the transmitter-arm and means for insuring synchronous movements of the worm-shafts for the transmitting and receiving arms.

5. In a printing-telegraph, the combination of a type-writing machine, a plurality of electromagnets for actuating the keys thereof, a plurality of contact-points insulated from each other and each connected in circuit with a key-actuating electromagnet, a driven worm-shaft, a receiving contact-arm for engaging with the contact-points, the said contact-arm being driven by the worm-shaft and a transmitter-arm combined with a worm-shaft for traversing the said transmitter-arm and means for effecting the driving of the transmitter screw-shaft and the receiver screw-shaft synchronously.

6. A printing-telegraph receiver, comprising a type-writing machine, a plurality of contacts insulated from each other and connected to operate different keys of the writing-machine, a pivoted armature, a swinging arm carried thereby, and cooperating with the contacts, a worm-shaft for swinging the said arm, a motor for driving the worm-shaft and electromagnetic means for arresting the motor.

7. A printing-telegraph receiver, comprising a type-writing machine, a plurality of insulated contacts connected to the mechanism for actuating the independent keys of the writing-machine, a vertically-swinging armature carrying a horizontally-swinging arm adapted to cooperate with the contacts, a magnet for the said armature, a motor for traversing the arm over the contacts, an electromagnetic device being connected in circuit of the electromagnet for the arm-carrying armature.

HERMAN KREUSLER.

Witnesses:

GEO. E. MORSE,
MAURICE BLOCK.