

No. 623,846.

Patented Apr. 25, 1899.

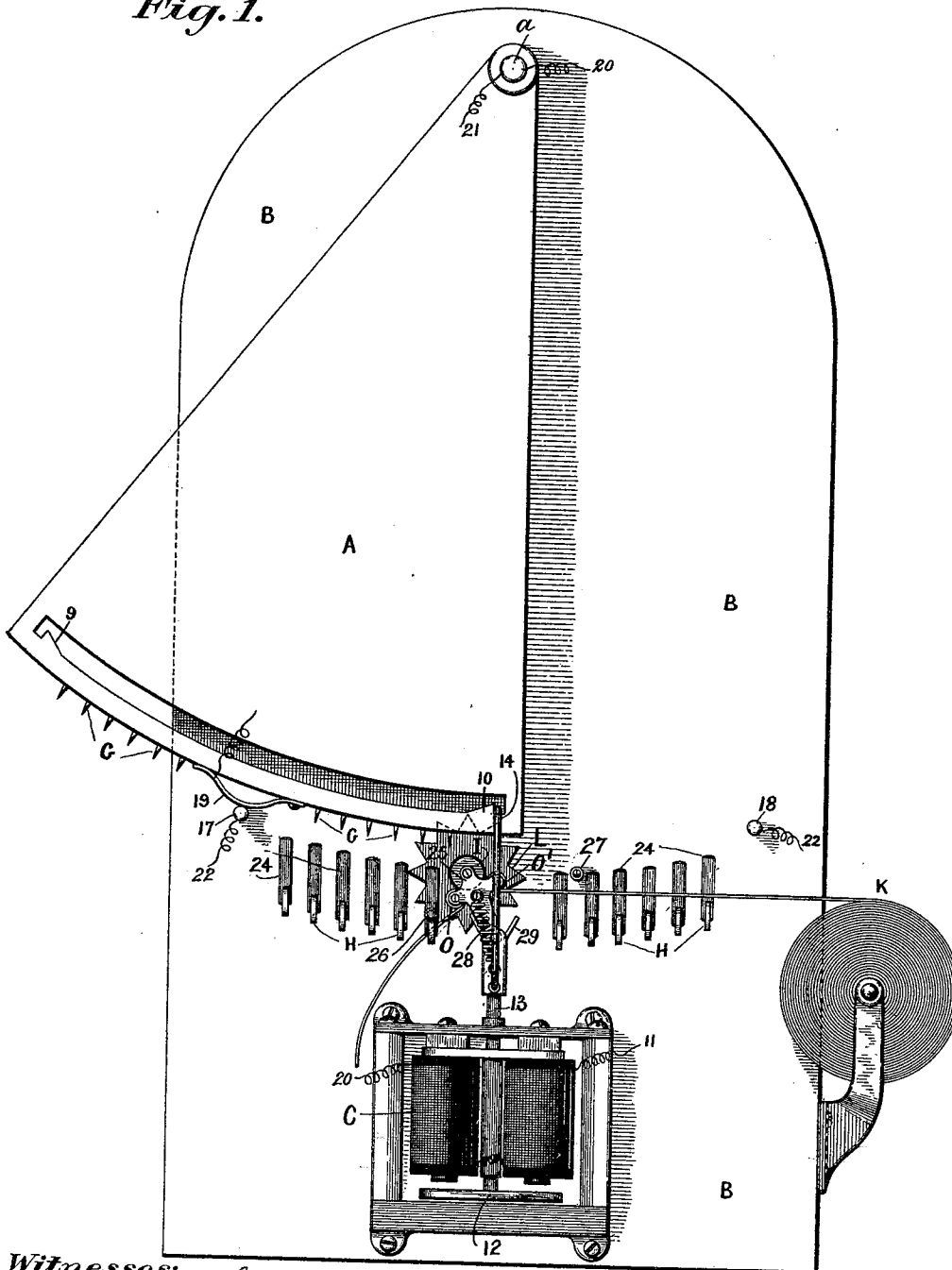
D. G. SMYTH.  
PRINTING TELEGRAPH.

(Application filed Dec. 31, 1897.)

(No Model.)

5 Sheets—Sheet 1.

Fig. 1.



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Inventor:  
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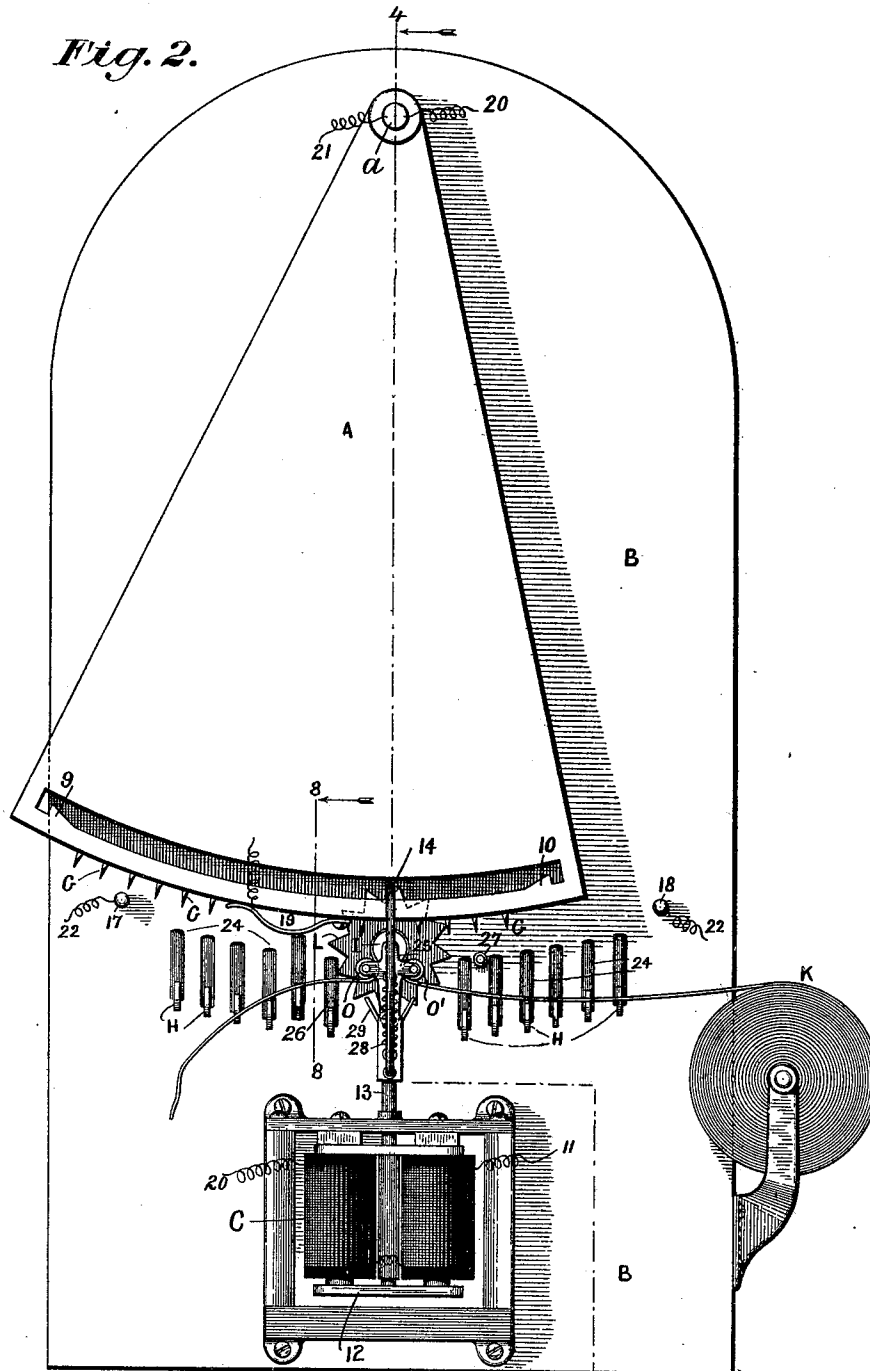
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5 Sheets—Sheet 2.

Fig. 2.



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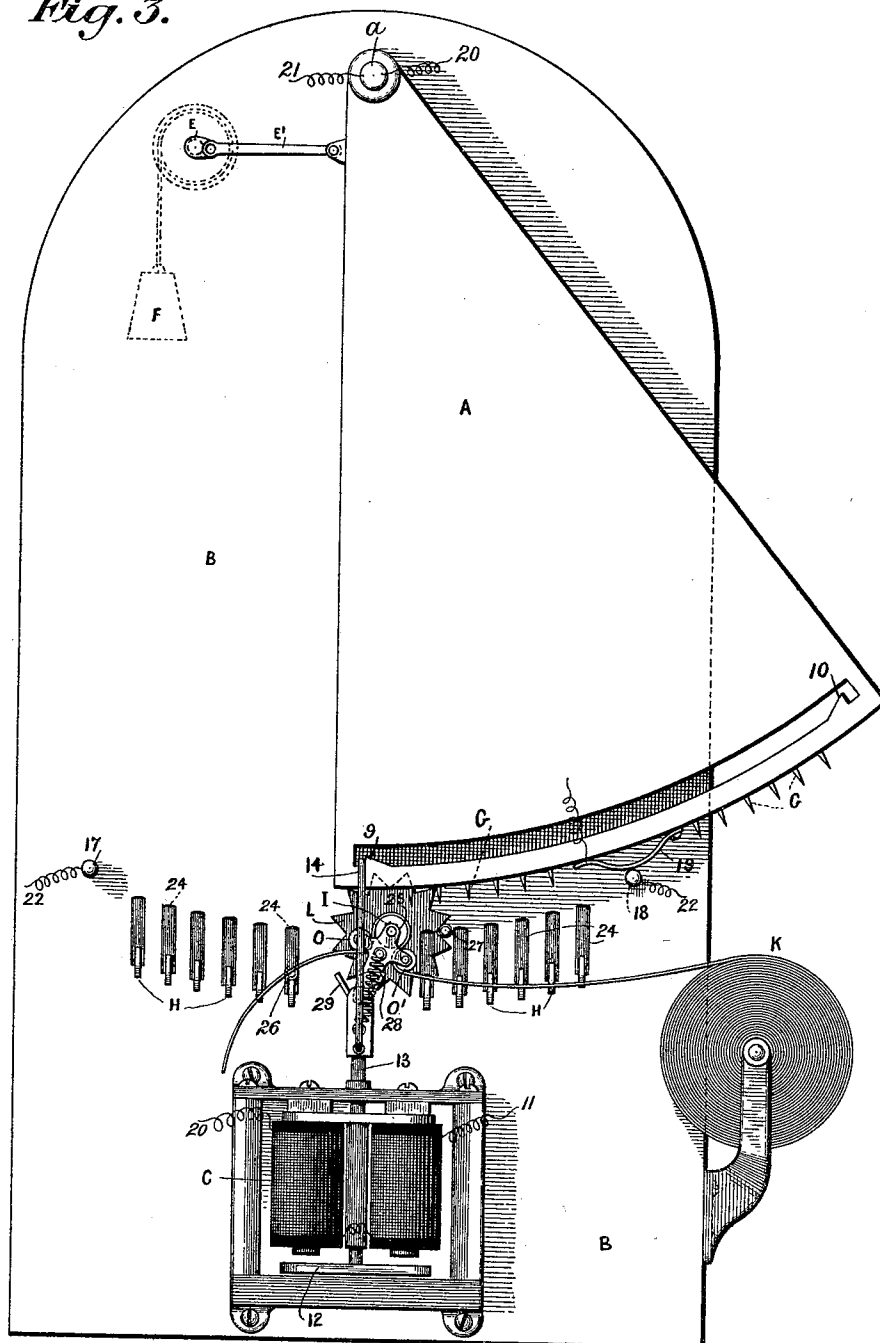
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5 Sheets—Sheet 3.

Fig. 3.



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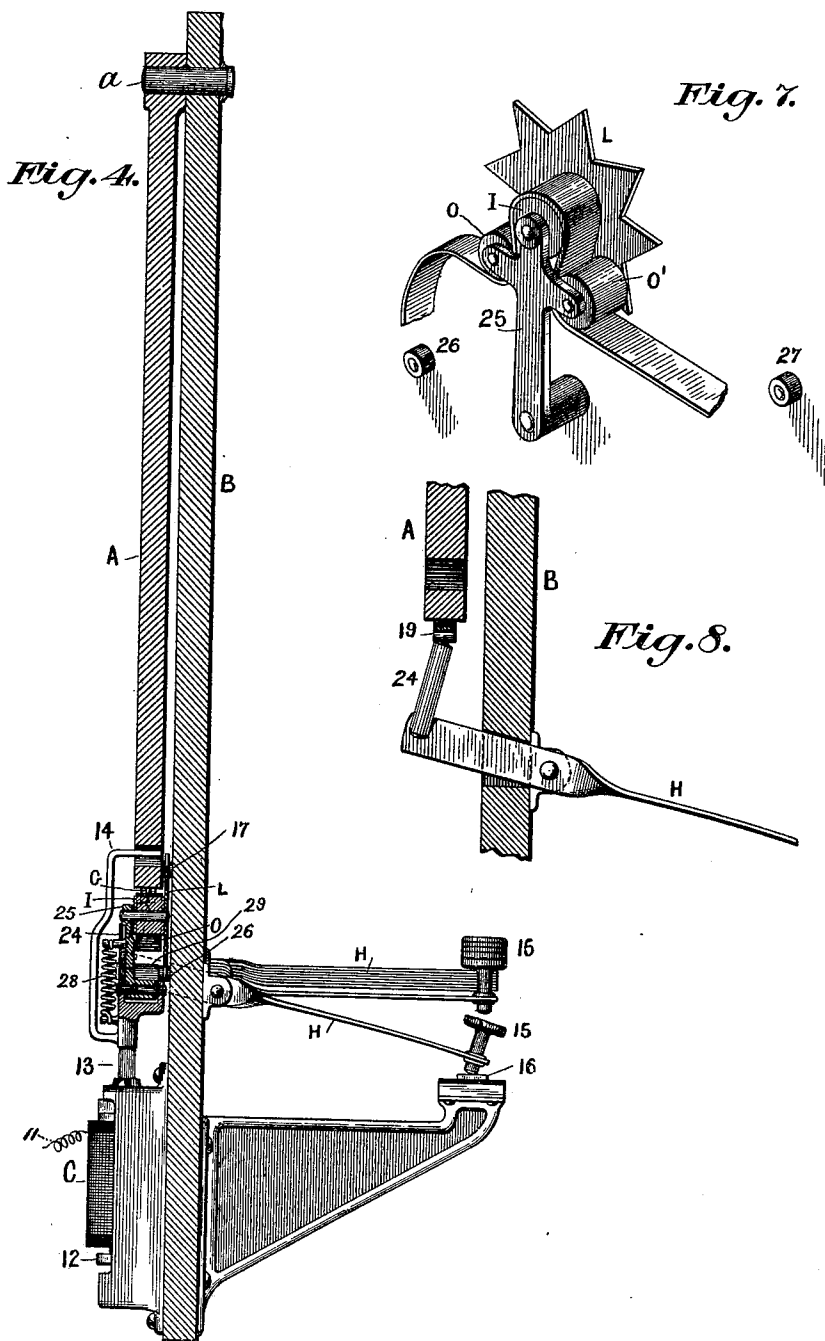
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5 Sheets—Sheet 4.



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(No Model.)

5 Sheets—Sheet 5.

Fig. 5.

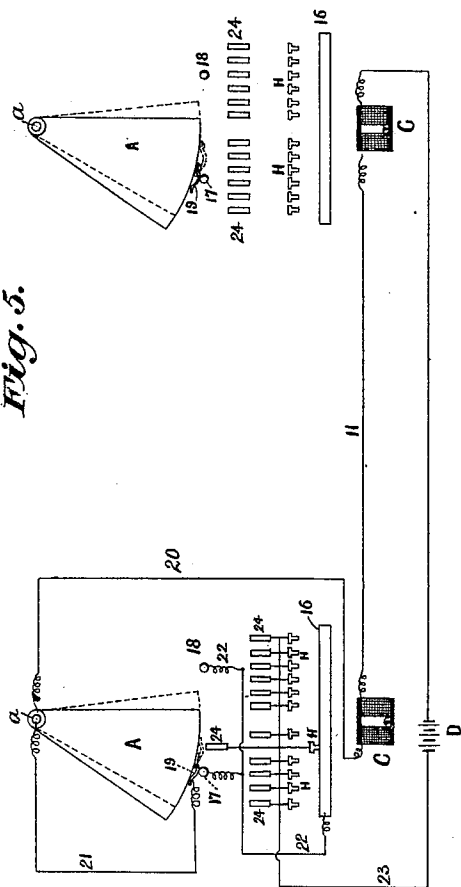
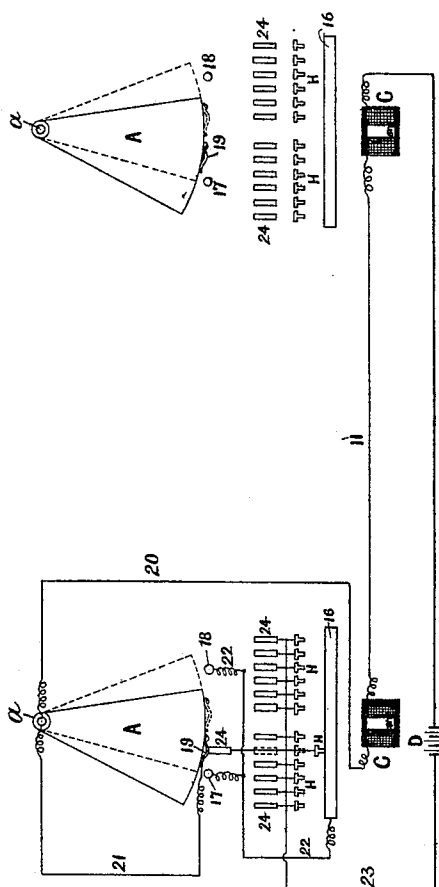


Fig. 6.



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# UNITED STATES PATENT OFFICE.

DAVID G. SMYTH, OF HARTFORD, CONNECTICUT.

## PRINTING-TELEGRAPH.

SPECIFICATION forming part of Letters Patent No. 623,846, dated April 25, 1899.

Application filed December 31, 1897. Serial No. 664,818. (No model.)

*To all whom it may concern:*

Be it known that I, DAVID G. SMYTH, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented an Improvement in Printing-Telegraphs, of which the following is a specification.

Type-writing machines have been actuated electrically, so that a receiving instrument is caused to print a letter corresponding to the key struck at the transmitting instrument, the circuit being controlled by synchronously-rotated wheels.

In the present invention the transmitting instrument at one end of the line and the receiving instrument at the other end of the line are provided with swinging pendulums, and these are latched at the extreme ends of their movements, and when a key of the transmitter is depressed the circuit is closed, the latches withdrawn, so that the two pendulums swing synchronously, and at the transmitting-station the circuit is again closed when a contact upon the pendulum arrives at the particular key that has been depressed, and the current at the distant station, acting on an electromagnet, raises a printing-roll into contact with the corresponding character upon the pendulum for printing the same, and the printing-roll yields and its support swings so as not to check the movement of the pendulum, and it continues its movement to the opposite point, where it is again latched, ready to be unlatched by the depression of another key of the transmitter-station, the printing being effected by the movement of the pendulum in either direction.

In the drawings, Figure 1 is an elevation illustrating the present improvement with the pendulum swung to the left. Fig. 2 is a similar elevation with the pendulum in the act of printing. Fig. 3 is an elevation similar to Fig. 1 with the pendulum swung to the right. Fig. 4 is a vertical section at about the line 4 4 of Fig. 2. Fig. 5 is a diagram illustrating the swinging of the pendulum synchronously while the circuit is broken. Fig. 6 is a similar diagram illustrative of the closing of the circuit by the key-contact at the transmitting-station. Fig. 7 is a perspective view illustrating the feeding of the paper, and Fig. 8 is a section at the line 8 8 of Fig. 2.

The pendulum A may be pivoted as may be most convenient, as at *a*, to a vertical board or plate B, and this pendulum is to be of any desired character. It is, however, represented as a sector, having a segmental slot near its lower edge, terminating as latches 9 and 10, engaged by a projection upon the armature of the electromagnet.

The electromagnet C is in a line-circuit. (Illustrated in Figs. 5 and 6.) A battery or other source of electric energy is shown at D, the line being indicated at 11, and the armature 12 is advantageously below the magnet and connected by a stem 13 with the detent or latch 14, so that when the electromagnet is energized the latch 14 is raised and the pendulum allowed to swing, and any suitable device may be employed for insuring a complete movement of the pendulum. I have illustrated in Fig. 3 such device by a crank E and connection E' to the pendulum, and a weight F is shown for turning the crank, and the crank is stopped upon the dead-center in one direction or the other at the time the detent engages one of the latches upon the swinging pendulum.

Projecting from the lower and curved edge of the pendulum A are types G, in number corresponding to the characters to be printed. Only twelve of these characters are represented for greater clearness, it being understood that there are to be as many of the characters as are required for the transmission of the messages, and the number and character of the characters correspond to the number and character of the finger-keys to be acted upon, and the finger-keys H are represented as arranged in two groups of six each, and the key-heads or press-buttons 15 should be marked with the proper letters corresponding to the types, and each finger-key is adapted to effect the closing of the line-circuit when depressed, and with this object in view the contact-bar 16 extends along beneath the range of types, and it is insulated, but placed in a local circuit having branch connections, as indicated in Figs. 5 and 6, to the contact-stops 17 and 18, and upon the pendulum A is a contact-spring 19, which engages the stop 17 or the stop 18 when the movement of the pendulum is arrested at the end of the swing, and the line-circuit extends from the

electromagnet C by the wire 20 to the pivot of the pendulum, and this pivot is connected to the spring 19 by the wire 21 or otherwise. Hence when the pendulum is in the normal condition of rest the line-circuit is closed from C through 20, 21, 19, and 17 or 18 and the wires 22 to the contact-bar 16, and the circuit is there broken, but the circuit is closed through any one of the finger-keys II that may be depressed, because all of the finger-keys are connected by the wires 23 to the ground circuit or battery. Hence when a finger-key is depressed the contact thereof with the bar 16 closes the circuit from the battery D through 23 II 16 22 17 (or 18) 19 21 20 to the electromagnet C at one end of the line and by the line 11 to the similar electromagnet C at the other end of the line, at which point, the connections being exactly the same, the current passing through the two electromagnets causes such magnets to raise the armatures and unlatch the pendulums, and these commence to swing simultaneously and synchronously, and in so doing the circuit is broken at 17 or 18, and the electromagnets release the armatures, and they immediately drop, but a circuit is again closed through the finger-key that may have been depressed by the contact-spring 19 upon the swinging pendulum at the transmitting-station coming into contact with the stud 24 on the finger-key II that has been depressed.

The studs 24 upon the respective finger-keys are of any desired character, preferably tipped with platina, and the springs 19 are to be sufficiently elastic to produce but little friction as the spring rubs across the end of the elevated stud, and in so doing the current passes from D through 23 II 24 19 21 20 to the magnet C at the transmitting-station and through the line 11 to the magnet C at the receiving-station, energizing both magnets and effecting the printing, as next described.

Upon the stem 13 of the armature a swinging link 25 carries the printing-roller I, upon which paper from the roll K passes, and there are guide-rolls O O', one at each side of the printing-roll I, so as to hold the paper to the printing-roll, and upon the arbor of the printing-roll I is a star-wheel L, and there are two fixed stops 26 and 27 upon the board or plate B, and when the link 25 is swung in one direction the star-wheel L engages the stop 26, and in so doing it is partially turned by one inclined side of a point coming against such stop 26, and when the link 25 is swung the other way the inclined side of another point comes in contact with the other stop 27 and gives to the star-wheel and to the printing-roll another turning movement in the same direction, so that the paper is drawn along progressively by the swing of the link and rollers from the position shown in Fig. 1 to the position shown in Fig. 3, and there is a contractile spring 28 between the link 25 and the stem 13, tending to hold the printing-roll in either position to which it may be swung, and the V-

shaped stand 29 on the upper end of the stem 13 limits the extent of the swinging movement of the link 25, and I remark that in Figs. 1, 3, and 7 the extent of swinging movement is exaggerated for greater clearness, the swinging movement usually required being only about fifteen degrees to twenty degrees, it only being necessary for the surface of the paper upon the roll I to be out of contact with the types as such types swing closely adjacent to such paper and printing-roll.

It will now be understood that the depression of a key closes the circuit and that the energizing of the electromagnets at the two ends of the line liberates the two pendulums simultaneously and they commence to swing, and in so doing the line-circuit is broken by the spring 19 separating from either 17 or 18 the armatures drop, so that the printing-roll I is out of the path of the types G; but when the spring 19 engages the stud 24 on the key that has been depressed, as indicated in Fig. 2, the line-circuit is again closed, as before mentioned, and the armatures of the electromagnets are raised, bringing the rollers I up against the type, which at this moment is in the proper position and corresponds to the key that has been depressed, so that the type engages the surface of the paper, and the swing of the pendulums swings the links 25 and printing-rolls from the position of Fig. 1 or Fig. 3 to the position of Fig. 2, at which point the printing is completed, and the further movement of the pendulums carries the printing-rolls and the links 25 to the position shown in either Fig. 1 or Fig. 3, ready for the next operation, and the completion of the swing of the pendulums causes such pendulums to be latched in the position shown in Fig. 1 or Fig. 3, ready for another key to be depressed.

By this improvement the printing is effected by the swing of the pendulum. The pendulum is latched at its extreme movement in one direction or the other between the printing of one letter and the printing of another. The pendulums swing in the same direction always and the impression is given that corresponds to the finger-key that has been depressed. The parts are not liable to get out of order or the electric connections to be interrupted and it is unnecessary to send over the line rapid pulsations, as has heretofore been necessary in turning a type-wheel between one impression and the next.

It will be apparent that the relative arrangements of the parts may be varied without departing from this invention.

In cases where there are several instruments on one line the types on opposite sides of the spring 19 may be the same, but in reverse order, so that the printing may be properly effected should some of the pendulums swing in an opposite direction to the transmitting-pendulum, or if two lines of types are employed extending across the segment of the pendulum the same object will

be effected, the types being reversed in their positions; but two letters being printed each impression the receiver can immediately see which line is being used, because one of the lines will be recognized as containing words, while the letters in the other line, being scattering, will not spell words.

I claim as my invention—

1. The combination in a printing-telegraph, of a swinging body, means for holding the swinging body at either end of its movement, means for liberating such swinging body, a range of keys for making and breaking the electric circuit, a segmental range of printing-types upon and moving with the swinging body, a presser for bringing the paper into contact with the printing-type and an electromagnet at the receiving-station for bringing into action the presser, and a circuit-closer at the transmitting-station moving with the swinging device for closing the circuit at the transmitting-station in connection with the finger-keys and effecting the printing at the receiving-station, substantially as set forth.

2. The combination with a pivoted segmental pendulum having latches near the extremes of its curved surface, of an electromagnet, a latch for holding the pendulum at either extreme of its movement and unlatched by the magnet, a contact-spring on the pendulum, two stationary contacts for closing an electric circuit when the pendulum is at rest, a finger-key and circuit connections closed at the transmitting-station for unlatching the pendulums at receiving and transmitting stations simultaneously and breaking the circuit by the movement of the pendulum at the transmitting-station, a circuit-closing device upon the finger-key for engaging the circuit-closing device on the pendulum and closing the circuit a second time, and printing mechanism brought into action by the second closing of the circuit, substantially as set forth.

3. The combination in a printing-telegraph, of an electromagnet, a printing-roll receiving a motion from the electromagnet and a swinging link for supporting the roll, guides for the paper passing around the roll, and a pivoted segmental range of types and means for swinging the same first in one direction and then in the other, the printing being effected by the contact of the paper with the given type, the link swinging from one position to the other and remaining for action with the types as they swing the other way substantially as set forth.

4. The combination in a printing-telegraph, of an electromagnet, a printing-roll receiving a motion from the electromagnet, a swinging link for supporting the roll, guides for the paper passing around such roll, a segmental range of types, the printing being effected by the contact of the paper with the given type and the swinging of the link from one position to the other, a star-wheel connected with the printing-roll and stops with which the star-wheel comes into contact for turning the

wheel and the printing-roll as such roll is swung from one position to the other, substantially as set forth.

5. The combination in a printing-telegraph, of a printing-roll, an electromagnet for giving motion to the same, guides for the paper, a swinging body and a segmental range of types carried by the same, a swinging link for carrying the printing-roll, a stand for the swinging link whereby the swinging link and printing-roll may occupy either one position or another and act with the swinging body and printing-type when moving in either one direction or the other, substantially as set forth.

6. The combination in a printing-telegraph, of a pendulum having a curved slot, latch projections near the ends of the slot, an electromagnet, an armature, a latch receiving its motion from the armature for liberating the pendulum, a range of types carried by the pendulum, a printing-roll and swinging link carrying the same and receiving motion from the electromagnet whereby the printing is effected by bringing the paper on the printing-roll into contact with one of the moving types and the roll and paper swinging during the printing operation by the contact of the moving type, substantially as set forth.

7. The combination with a swinging pendulum carrying a range of printing-types, of latches for holding the pendulum at the extreme of its movements, mechanism for completing the swing of the pendulum in either direction, a range of finger-keys carrying electric contacts, a circuit-closing bar engaged by the depression of either finger-key, a spring on the pendulum and stationary contact-stops for closing a circuit connection when the pendulum is at rest, and printing mechanism brought into action by an electromagnet and the closing of an electric circuit through the depressed key and the swinging pendulum, substantially as set forth.

8. The combination with the electromagnet and its armature, of a latch actuated by the armature, a printing-roll, a link pivoted upon the armature-stem and carrying the printing-roll, a star-wheel and stationary stops for turning the printing-roll progressively, a stand for limiting the swinging movement of the link and printing-roll, a contractile spring between the link and the armature-stem for holding the link in either position to which it may be swung, and types for effecting the printing by contact with the paper on the printing-roll, substantially as set forth.

9. The combination in a printing-telegraph, of a range of finger-keys, a contact-bar for such finger-keys, a swinging device and a range of types carried thereby, means for holding the swinging device at either end of its movement, and a range of finger-keys and circuit connections for liberating the swinging device when either finger-key is depressed, substantially as set forth.

10. The combination at the transmitting-



station, of a range of finger-keys and electric-  
circuit contacts thereon, a circuit-bar en-  
gaged by either finger-key, a swinging de-  
vice and a spring on the same for closing the  
5 circuit connections with either of the finger-  
keys, a line-circuit and swinging body at the  
receiving-station and a range of printing-  
types carried by the same, means for insur-  
ing the complete movement of the swinging  
10 device in either direction, and means for  
holding such swinging device at the extremes  
of its movements, an electromagnet and a  
paper-carrying device brought into action by  
the electromagnet to impress any type corre-  
15 sponding with the finger-key depressed at the  
sending-station, substantially as set forth.

11. The combination in a printing-tele-  
graph, of a range of finger-keys at the send-  
ing-station, a swinging body carrying a cir-  
20 cuit-closing device to contact with either of  
the finger-keys that may be depressed, a  
swinging body and a segmental range of  
printing-types upon the same at the receiv-

ing-station, latches for holding the swinging  
bodies at both stations, electromagnets and 25  
circuit connections for releasing the swing-  
ing bodies simultaneously at both the send-  
ing and transmitting stations when the fin-  
ger-key is depressed, the line-circuit being  
broken by the swinging of such bodies, a roller 30  
for the paper and an electromagnet for bring-  
ing the same into contact with the type at  
the receiving-station corresponding to the  
finger-key depressed at the sending-station,  
the line-circuit being closed at the sending- 35  
station by the contact on the swinging body  
engaging the depressed key for energizing the  
printing-magnet at the receiving-station, sub-  
stantially as set forth.

Signed by me this 24th day of December, 40  
1897.

DAVID G. SMYTH.

Witnesses:

CHARLES A. SAFFORD,  
PHILO P. BENNETT.