

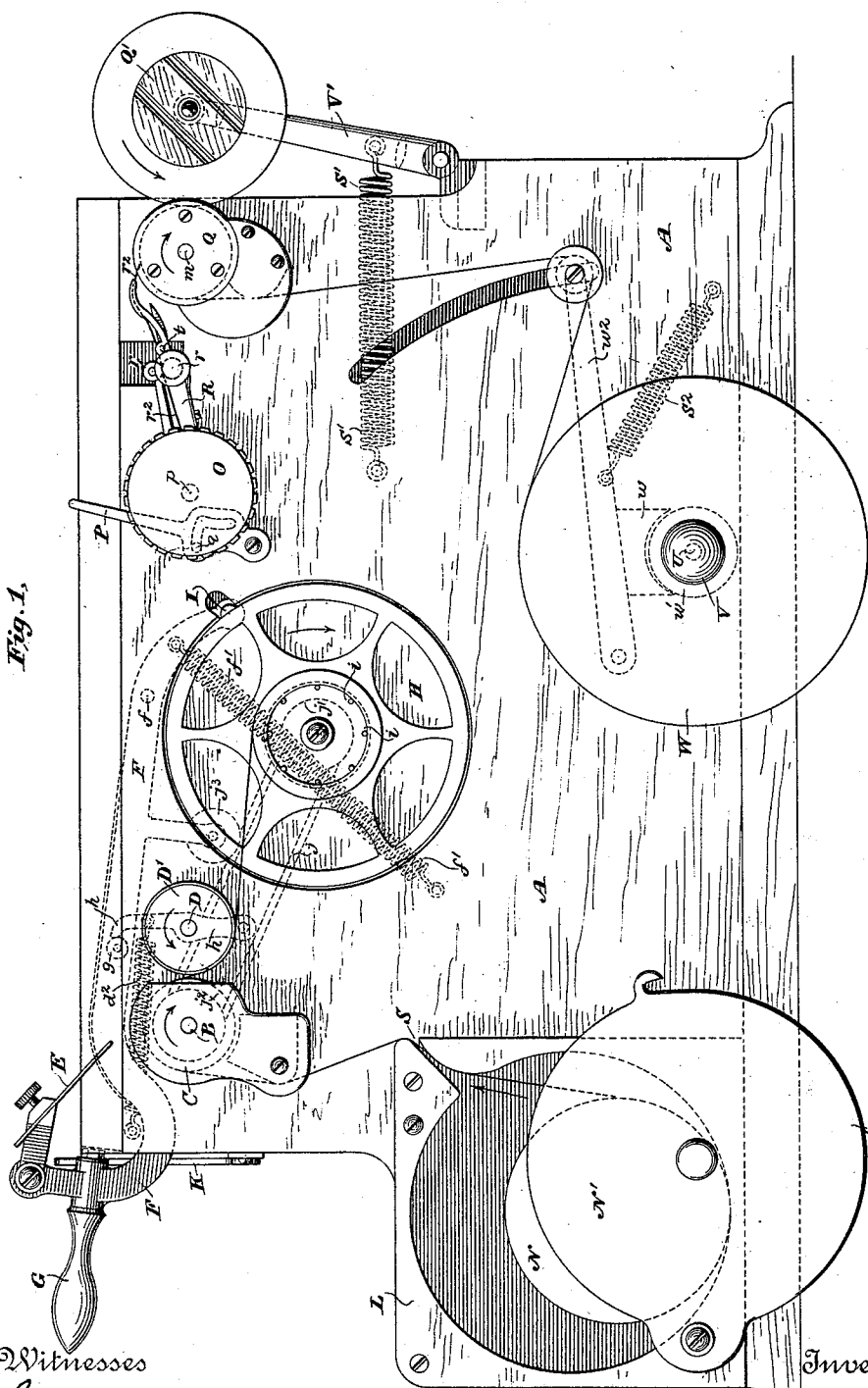
(No Model.)

4 Sheets—Sheet 1.

F. ANDERSON.
AUTOMATIC TELEGRAPH.

No. 431,794.

Patented July 8, 1890.



Witnesses
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Henry W. Lloyd.

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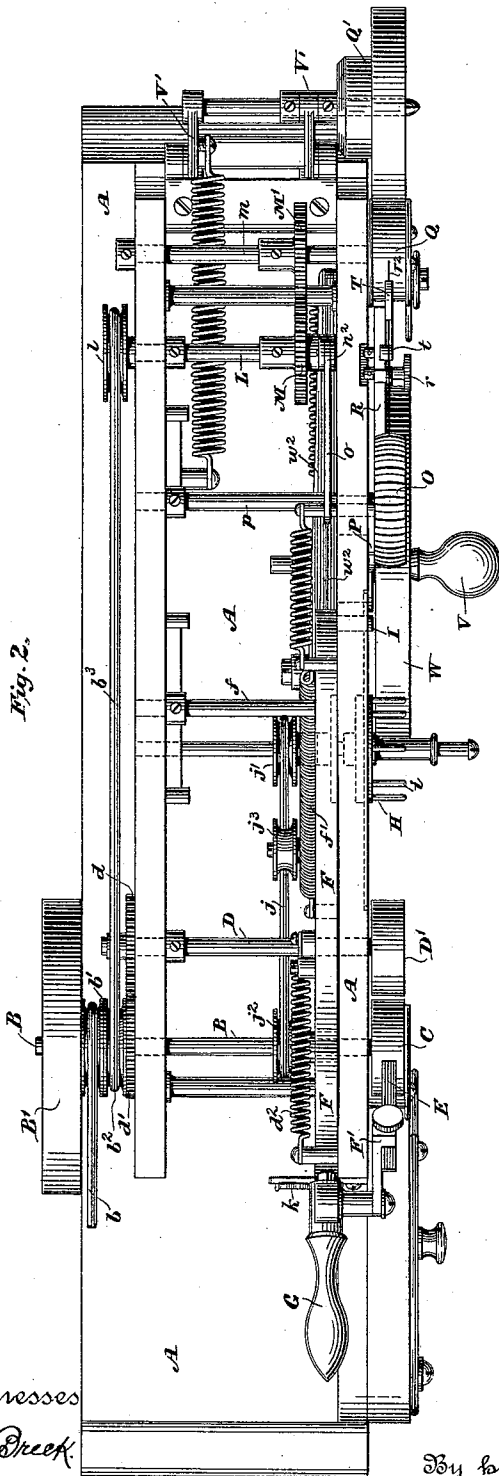
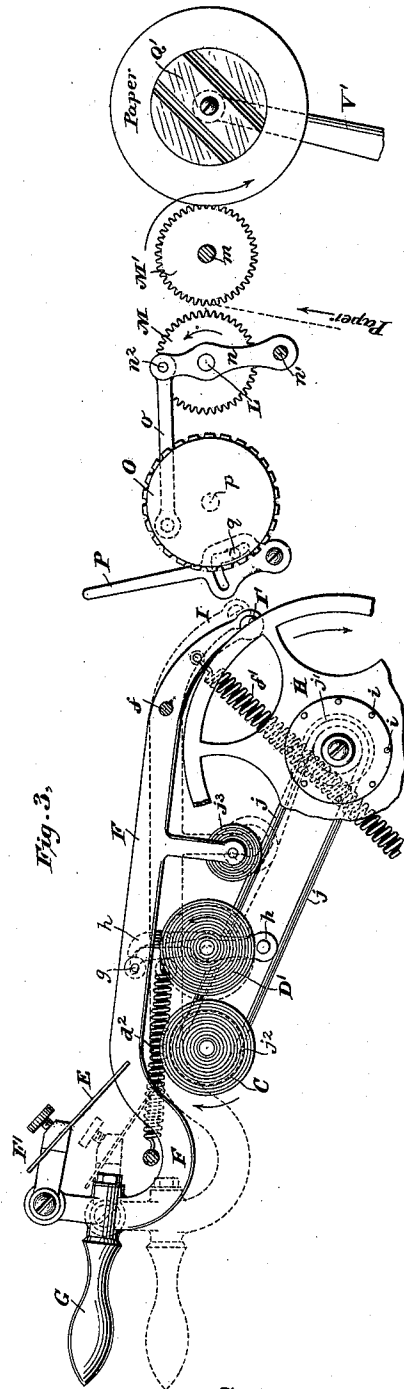
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4 Sheets—Sheet 2.

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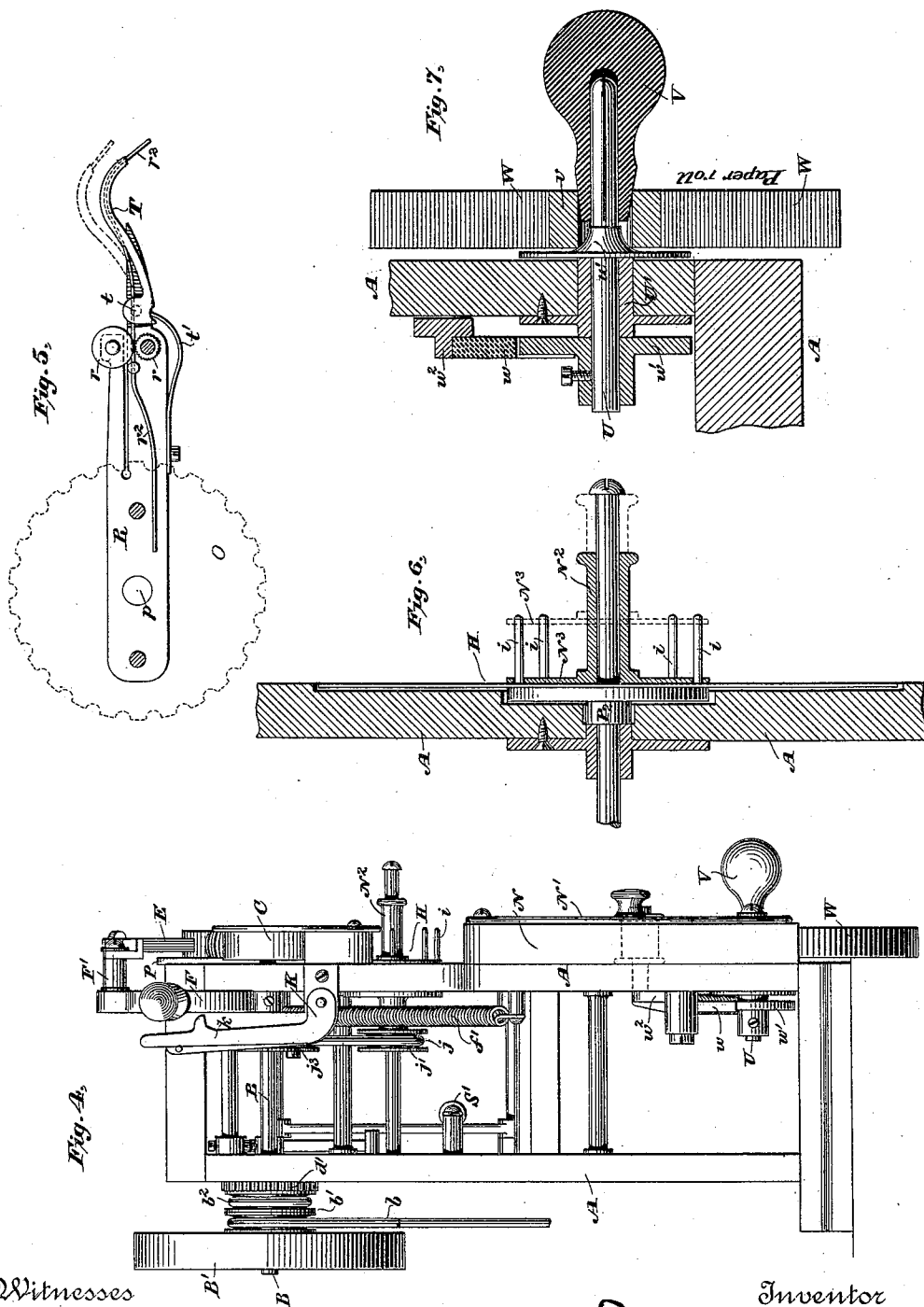
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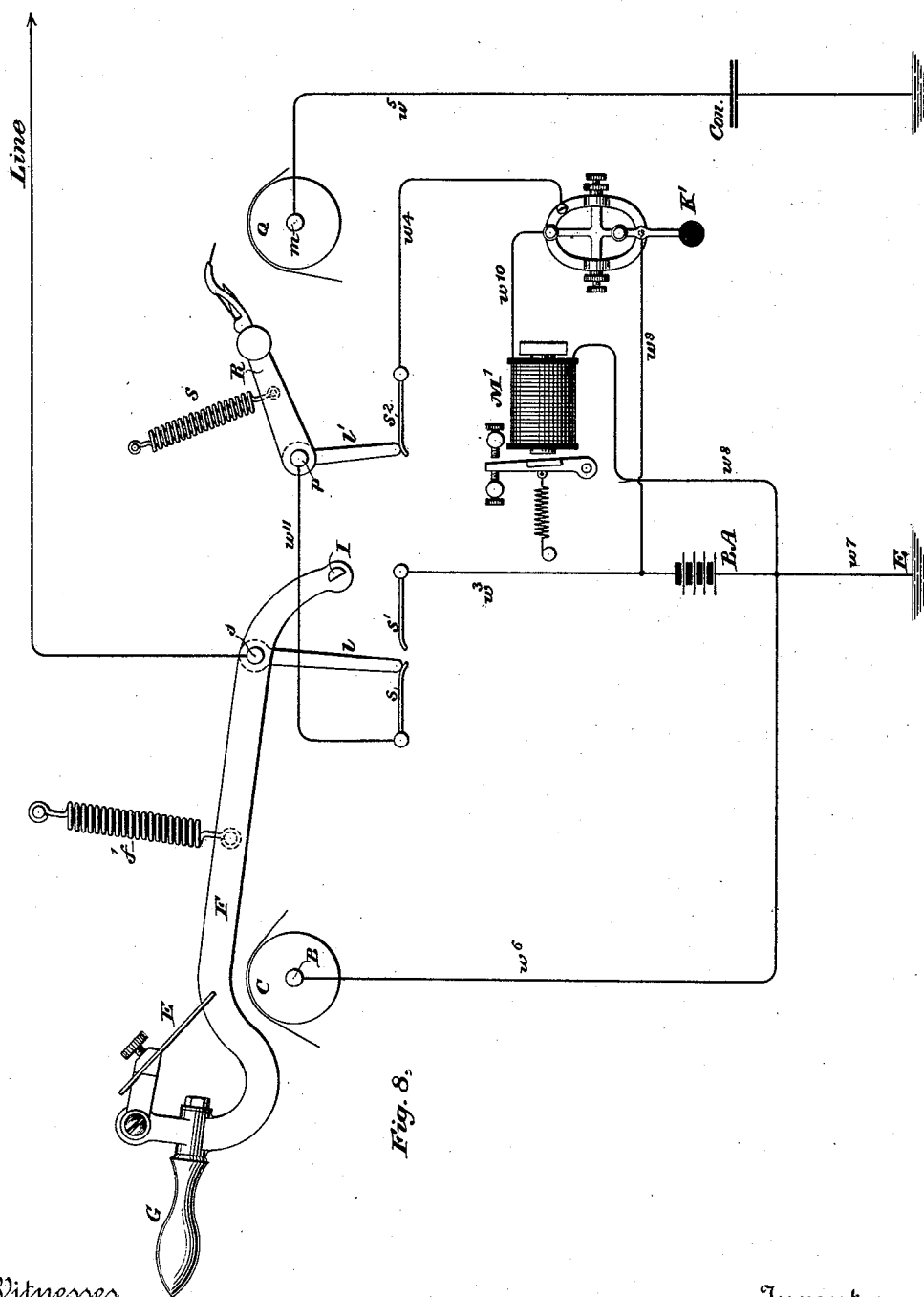
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4 Sheets—Sheet 4.

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UNITED STATES PATENT OFFICE.

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AUTOMATIC TELEGRAPH.

SPECIFICATION forming part of Letters Patent No. 431,794, dated July 8, 1890.

Application filed March 8, 1890. Serial No. 343,182. (No model.)

To all whom it may concern:

Be it known that I, FRANK ANDERSON, a citizen of the United States, residing at Peekskill, in the county of Westchester and State of New York, have made a new and useful invention in the Art of Automatic Telegraphs or Rapid Telegraphy, of which the following is a specification.

My invention relates particularly to improvements in transmitting and receiving apparatus of that type of automatic telegraphs in which a perforated fillet is used at the transmitting-station, and a chemical recording-fillet at the receiving-station; and its objects are, first, to simplify apparatus of the nature referred to, and, second, to make such apparatus more certain in its operation. I accomplish these objects by the mechanism and arrangement of circuits and parts, hereinafter described, but particularly pointed out in the claims, which follow this specification.

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

Figure 1 is a side or elevational view of a combined transmitter and receiver constructed in accordance with my improvements. Fig. 2 is a plan view of Fig. 1. Fig. 3 is a detail view of that portion of the apparatus which controls the movement of the transmitting and receiving pens and the reels for winding up the transmitting and receiving fillets. Fig. 4 is an end view of Fig. 1, as seen looking from left to right. Fig. 5 is a detail view of the receiving-pen and its improved connections. Fig. 6 is a cross-sectional detail view of the reeling mechanism upon which is wound the transmitting-fillet as the messages are transmitted. Fig. 7 is a similar view of the roll of chemical recording-paper as it appears before being wound over the record-receiving cylinder. Fig. 8 is a diagrammatical view showing the circuits at one station for the transmitter, the receiver, and an independent Morse signaling apparatus, together with the switch mechanism, whereby the battery-circuit is transferred from either portion of the apparatus to the other.

In all of the drawings like letters of reference represent like parts wherever used.

Referring to the drawings in detail, A represents the frame-work supporting the entire mechanism.

B is a shaft journaled in the frame-work, and carrying on its rear end a pair of pulleys b' b^2 and a fly-wheel B' , together with a pinion d' , meshing with a second pinion d , carried by a second shaft D, also journaled in the frame of the machine. The other end of the shaft B carries a metallic transmitting drum or cylinder C—such as is ordinarily used in apparatus of this type—and connected through a conductor w^6 with the ground, as shown in Fig. 8. At an intermediate point upon the shaft B is a third pulley j^2 , connected by a belt j to the pulley j' on a third shaft, also journaled in the frame.

On the outer end of the shaft D is a friction or tension pulley D' , adapted to bear against the transmitting-fillet located between it and the transmitting-drum C, as shown in Fig. 1. This friction-pulley D' is held normally out of action by a lever h , bearing against a lug g on the lever F in its upward position, the end of the shaft D being journaled in said lever h , but is drawn outward into contact with the drum C by the spring d^2 when the lever F is in its lower position, as clearly shown in Figs. 1 and 3. This lever F carries a transmitting-brush E, adapted to complete the circuit in transmitting through perforations in the transmitting-fillet on the transmitting-cylinder C. Said brush is adjustably secured to said lever, and may be brought into contact with or carried away from the transmitting-cylinder by moving the lever F around the pivot f , through the agency of an insulated handle G, said lever having also a swinging contact or switch-lever l for changing the circuit from the transmitter to the Morse signaling apparatus, and being held in its upward position by a spring f' , as clearly shown in Fig. 8.

On the extreme right-hand end of the lever F is a lug I, which is adapted to act as a brake upon the disk H, which forms part of the paper-reel for reeling up the transmitting-fillet as the messages are transmitted. This reel is composed of pins i , secured to a fixed head P^2 , which rotates with the shaft, and is provided with a perforated sliding collar N^3 and

sleeve N^2 , adapted to be moved longitudinally on the shaft, so as to force the roll off of the pins after it has been completed, as clearly shown in Fig. 6. The transmitting-fillet, consisting of a roll N of perforated paper, is inserted in a circular or disk-like box L , having a hinged cover N' and a slit or opening S to permit its withdrawal therefrom when reeled off. From the slit S the fillet passes up over the transmitting-cylinder C , down between said cylinder and the tension or pressure-roller D' , and is secured to the reel H by weaving it through the pins i .

k (see Figs. 2 and 4) is a hook on a pivoted lever K , secured to the frame for the purpose of locking the lever F in its downward position when the apparatus is transmitting.

j^3 is a belt-tightening pulley carried by the lever F and adapted to tighten the belt j , which propels the reel H when the apparatus is transmitting. This constitutes the transmitting apparatus.

I will now describe the receiving portion of the apparatus located on the same frame.

L is a shaft, loosely journaled at its rear end in the frame A and journaled at its front end in a link n , pivoted to the frame at n' , the upper end of said link being connected at n^2 by an additional link o to a milled thumb-disk O , carried by a shaft p , also journaled in the frame.

M is a gear-wheel carried by the shaft L and adapted to mesh with a second gear-wheel M' on a shaft m parallel with the shaft L , and on the outer end of the shaft m is a metallic receiving drum or cylinder O of the usual form.

l is a pulley on the shaft L , driven by the belt b^3 , connected to the main driving-shaft B by the pulley b^2 .

r^2 is the receiving-stylus. This receiving-stylus consists, preferably, of a wire of iron or steel, and is carried by a pivoted curved tubular sleeve T , the interior diameter of which is sufficient to permit the stylus to slide freely therein. The tubular part T is pivoted to an arm R , secured to the disk O and shaft p , as clearly shown in Fig. 5.

r is a pair of feeding-rollers, the upper one provided with a milled head, and both of them adapted to propel the stylus r^2 through the curved tube T .

On the under side of the arm R is secured a spring t' , the free end of which bears against the short arm of the pivoted sleeve T and acts under tension to hold said sleeve in the position shown in full lines, and its function is to constantly hold the end of the stylus r^2 upon the receiving chemical paper in spite of any inequalities which may be found in said paper. I find that with the stylus arranged as in Fig. 5 there is an absolute certainty of contacting at all times, and the curved tubular sleeve gives to it a firmer bearing than is ordinarily had with chemical-receiving styluses.

On the inner face of the disk O is secured a

stop-pin q , adapted to slide freely in an angular notch of the pivoted lever P , pivotally secured to the side of the frame A , as shown in Figs. 1 and 3. The function of this lever, pin, and slot is to lock the disk O in its forward position, as will be understood on examination of Figs. 1 and 3.

Q' is a paper-bearing cylinder for winding up the recorded message as it is received. It is carried by an arm V' , pivoted to the frame of the machine at its lower end and held frictionally against the receiving-drum Q by an adjustable spring S' , which permits the lever V' to swing outward as the diameter of the roll of the received message increases, all as clearly shown in Fig. 1.

U , Figs. 1 and 7, is a shaft adapted to carry the prepared roll of moistened sensitized receiving-paper. It is journaled in the side of the frame A in a journal-bearing U' , and has on its outer end a conical-shaped disk w' , the outer end of the shaft being split, as clearly shown in Fig. 7, and adapted to receive a conical-shaped plug V , the two conical portions w' and the inner end of the plug V being adapted to fit within the sleeve v , upon which the prepared sensitized receiving-strip has been previously wound. It is the function of these two conical parts and sleeve v to center and secure the roll to the shaft U , frictionally, so that as the strip is unwound it will cause said shaft to rotate, and with it the disk w' on its inner end. Upon this disk w' rests a brake w , carried by a lever w^3 , pivoted at one end to the frame of the machine and carrying at its free end a tension-roller, under which the prepared message-strip is carried in its path to the receiving roller or cylinder Q . This brake and tension-lever w^2 is provided with an adjustable spring S^2 for regulating the pressure of the brake w upon the disk w' , and the function of these parts is to prevent the moistened paper from unreeling when the lever is in operation, thereby preventing exposing to the dry influence of the air as little of the moistened receiving-paper as possible. With this arrangement of brake and gearing the roll of receiving-paper W is stopped at the very instant the pen or stylus r^2 is lifted from the paper.

Referring to the diagram in Fig. 8, BA is the battery. w^7 is a common earth circuit for the transmitting and signaling circuits. w^6 and w^5 are circuits from the transmitter and receiver to earth. $Con.$ is a condenser in the receiving-circuit. l and l' are switch-levers for changing the circuit of the battery BA , either through the transmitter, the receiver, or the signaling apparatus controlled by the key K' , said switches acting on contact-springs s s' s^2 . M' is a Morse relay or signaling apparatus.

I will now describe the operation of my improved device. The apparatus at the two stations is identically alike. The belt b (shown in Figs. 2 and 4) is connected with some constant running source of power, so that the shaft B , with its fly-wheel B' , is always run-

ning. A roll of perforated paper is then placed in the cylindrical receptacle or box L of substantially the same depth as the width of the transmitting-fillet. This roll is placed, as shown in Fig. 1, so that the weight of the roll rests upon the paper passing out of the slit S in the direction of the arrow, thence over the transmitting-cylinder C between it and the tension-roll D', under the latter to the right, where it is interwoven about the pins *i i* of the winding-reel H. Similarly the receiving-roll W of chemically-prepared paper is centered upon the shaft U at the two stations, but its free end is carried under the tension-pulley on the end of the brake-lever w^2 , up and over the receiving-cylinder Q, where it is attached to the receiving-roll Q' by being passed through the lateral slits in said cylinder. The spring S', being under tension, causes the lever V' to bring the roll Q' into frictional contact with the receiving-drum Q. The apparatus is now ready to start, and the operator at one of the stations now signals through the key K' to the distant station by the Morse code to the effect that he is about to transmit. The circuit for the Morse apparatus is as follows: Normally there is no battery on line, and the circuit from station to station is from earth E by wire w^7 , wire w^8 , relay M', wire w^{10} , the frame of key K', wire w^4 , spring s^2 , switch-lever l' , wire w^{11} , spring s , switch-lever l to the distant station, where it passes to earth through duplicate parts. The key K' is a two-point key of well-known construction, and on depressing it the relay M' at the transmitting-station is cut out of circuit and the battery BA is placed on the line and the distant relay caused to respond. The arrangement of circuits for this improved apparatus is designed especially for use with my improved system covered by Patent No. 407,460, granted July 3, 1889, wherein the transmitter is automatically made to shunt the transmitting-battery from line. When the operator at the receiving end of the line is made aware of the fact that a message is to be transmitted he locks his receiving-pen or stylus in receiving position by the lever P, as shown in Fig. 1, thereby breaking the circuit from the switch-lever l' to spring s^2 , and connecting the receiving-cylinder Q to earth through the wire w^5 and condenser Con. The transmitting operator then forces the lever F in its downward position through the agency of the handle G, thereby bringing the transmitting brush or pen E into contact with the transmitting-fillet carried by the cylinder C. The same act causes the switch-lever l to be transferred from the spring s to the spring s' , thereby placing the battery BA directly on the main-line circuit, while the brake I is removed from the surface of the reel H, and the tension-pulley j^3 is caused to tighten the belt j , thereby causing the reel to wind up the message-fillet as it is fed forward by the drum C and pressure-roller D'. The operator at the receiving-station has in

the meantime rotated the disk O to the right and caused the locking-lever P to lock it in its extreme forward position, and by this act has thrown the constantly-rotating gear M into gear with the gear-wheel M', thereby giving to the receiving-cylinder Q and paper-reel Q' rotation in the direction of the arrows, as shown in Fig. 1. The act of rotating the disk O also brings the stylus or receiving-pen r^2 into contact with receiving-paper resting on the cylinder Q and connected to the wire w^5 , passing to the condenser Con., and thence to earth. Under this condition of affairs transmission continues as long as the apparatus is left in the position named, or until all of the transmitting-fillet in the roll N, located in box L, has been unwound and reeled upon the reel H. When this occurs, the apparatus is stopped, and the paper wound on the reel H is removed by drawing the sleeve N² and its perforated disk N³ into the forward position shown in dotted lines in Fig. 6, thereby forcing the paper off the pins *i i* in the form of a roll, after which it is labeled and stored away for future reference.

I am aware that it is old in the art to locate a transmitting and receiving drum upon a single shaft propelled by an extraneous source of power and to unite the shaft with either of said drums at will, and I make no claim therefore, broadly, to the application of the principle of propelling said parts from a single source of power. I do not, however, limit myself to the specific apparatus hereinbefore shown and described for performing the functions attributed thereto, as it is obvious that many modified forms of my apparatus might be devised which would come within the scope of the claims as drawn.

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

1. In an automatic telegraphic transmitter, a transmitting cylinder or drum, in combination with a tension or pressure roller, said parts being geared together and to the same source of power by toothed gearing, substantially as described.

2. In an automatic telegraphic transmitter, a transmitting cylinder or drum, in combination with a pressure-roller, each carried by an independent shaft and both connected to a common source of power by toothed gearing, substantially as described.

3. In an automatic telegraphic transmitter, a transmitting cylinder or drum carried by a power-driven shaft, in combination with a tension or pressure roller carried by a second shaft geared to the first-named shaft by toothed gearing, and provided with means for bringing it into frictional bearing with the transmitting-fillet carried by the transmitting-drum, substantially as described.

4. In an automatic telegraphic transmitter, a contact drum or cylinder, a pressure or tension roller, a transmitting brush or stylus, and

a belt-tightening pulley, in combination with gear-wheels, a belt, and mechanical connections, as described, for causing the brush to contact with the transmitting fillet and drum and the pressure or tension roller to feed the fillet forward, all from a single source of power, substantially as described.

5. In an automatic telegraphic transmitter, a contact or transmitting drum or cylinder, a pressure or tension roller, a transmitting-brush, a paper-reel, a belt-tightening pulley, and a roll of perforated paper resting by its own weight in a retaining box or chamber and having its free end passing between the transmitting-drum and the tension-pulley and attached to a reel, in combination with intermediate mechanical connections, as described, whereby when the brush is in position to transmit the pressure-roller and transmitting-drum have frictional contact with the fillet, and said pressure-roller and the fillet or paper reel are geared to the same source of power as the transmitting-drum, substantially as described.

6. A reel for a tape or fillet, consisting of a flange or disk secured to a shaft, said flange or disk having a series of paper-holding pins, in combination with a sliding sleeve having a perforated collar adapted to slide over the pins, substantially as described.

7. A paper-reel consisting of a fixed disk or flange and a sliding sleeve, the former secured to a shaft and the latter adapted to slide longitudinally thereon, in combination with a series of paper-holding pins secured to the fixed disk or flange and a perforated collar, said collar being integral with or fixed to the sleeve and adapted to slide over the fixed pins, substantially as described.

8. In an automatic telegraphic transmitter, a transmitting-drum, a contact-brush, and feeding devices, as described, in combination with a paper-reel and a brake for checking the reel when the transmitting-brush is out of contact with the fillet, substantially as described.

9. In an automatic telegraphic transmitter, a power-driven shaft carrying a transmitting-drum, a feeding or tension roller carried by a separate shaft geared to the first-named shaft, a contact-brush, a belt-tightening pulley and brake carried by a hand-lever, and a paper-reel having a brake-disk, in combination with gearing and a belt, substantially as described.

10. In an automatic telegraphic receiver, a rotary shaft carrying a gear-wheel, a second shaft carrying a receiving-drum, a receiving-pen carried by an arm secured to a third shaft, and mechanical connections and gearing between the pen and the shafts for causing the drum to rotate and the pen to bear on

the fillet carried by said drum, substantially as described.

11. In an automatic telegraphic receiver, a shaft geared to a source of power, a second shaft carrying a receiving-drum, a receiving-pen, a receiving-fillet, and a reel for winding up the fillet, in combination with connections, as described, for throwing the pen, the drum, and the reel into and out of operative relation, substantially as described.

12. A pen for an automatic telegraphic receiver, consisting of a curved tubular retaining-sleeve and an adjustable conducting-stylus fitting therein, with a feeding device therefor, the retaining-sleeve being elastically sustained at its fixed end, substantially as described.

13. A receiving-pen for an automatic telegraphic receiver, consisting of a curved tubular retaining-sleeve provided with a longitudinally-adjustable conducting-stylus fitting therein, in combination with means for adjusting the stylus at will and a yielding support for the fixed end of the retaining-sleeve, substantially as described.

14. A receiving-pen for an automatic telegraphic receiver, consisting of a pivoted arm, a yielding pen-carrying arm pivoted to the former, and a spring-connection between the two, in combination with a longitudinally-adjustable stylus carried by the yielding arm, substantially as described.

15. A pen for an automatic telegraphic receiver, consisting of a pivoted arm, a yielding arm carrying an adjustable stylus, and a spring-connection between the two arms, with means for feeding the stylus forward or backward at will, substantially as described.

16. In an automatic telegraphic receiver, a roll of receiving-paper carried by a shaft journaled to the frame of the machine, a brake adapted to check the advance of the paper when the apparatus is not in action, a paper-reel for taking up the paper as fast as it is reeled off the first roll, said reel having frictional contact with the receiving-drum, substantially as described.

17. In an automatic telegraphic system, a lever carrying a transmitting-brush and a switch lever or arm, a second lever carrying a receiving-stylus, and a second switch lever or arm, in combination with signaling and receiving apparatus, and switch-connections, whereby said call apparatus is operated from the same battery which is utilized by the automatic mechanism, substantially as described.

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