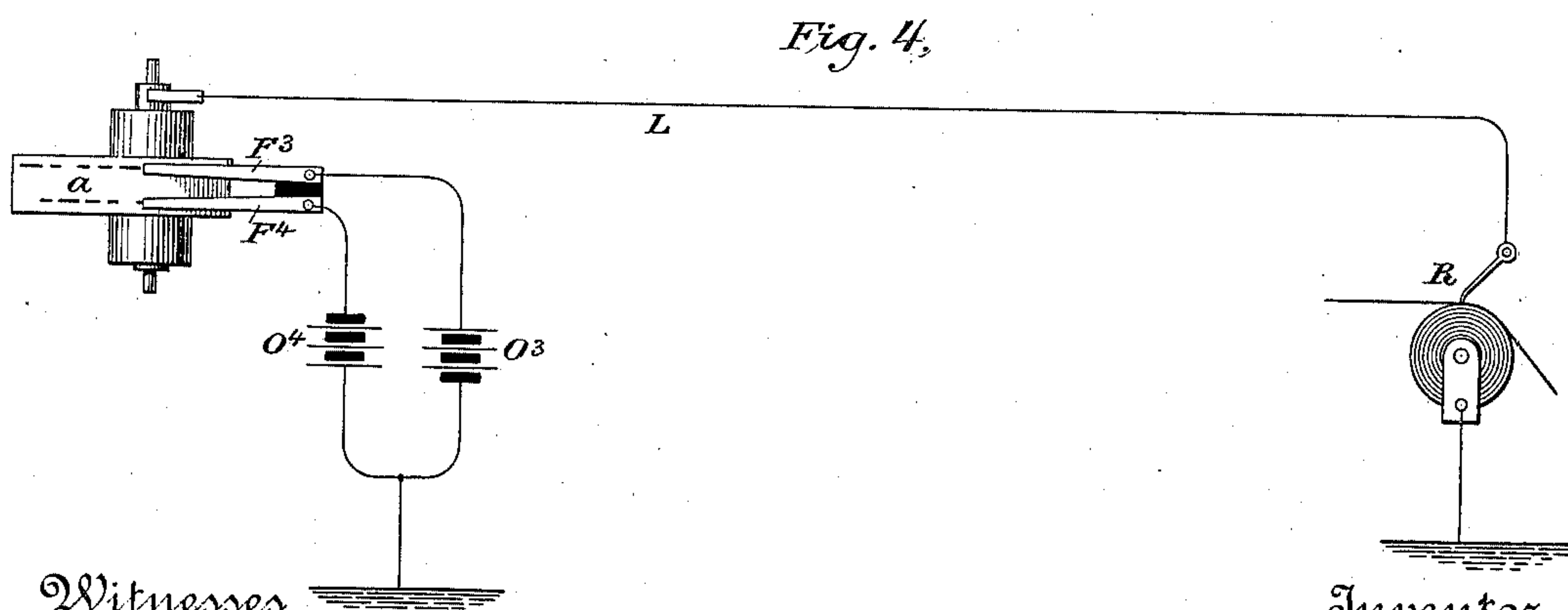
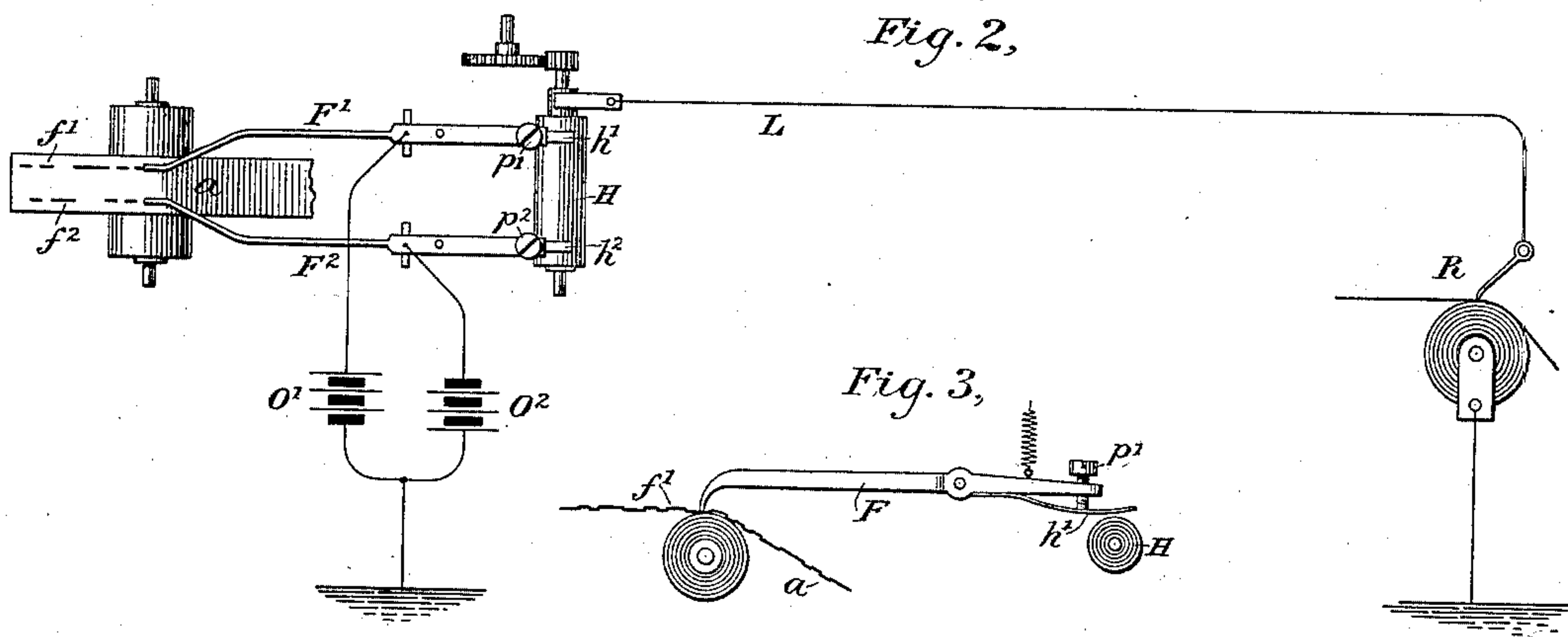
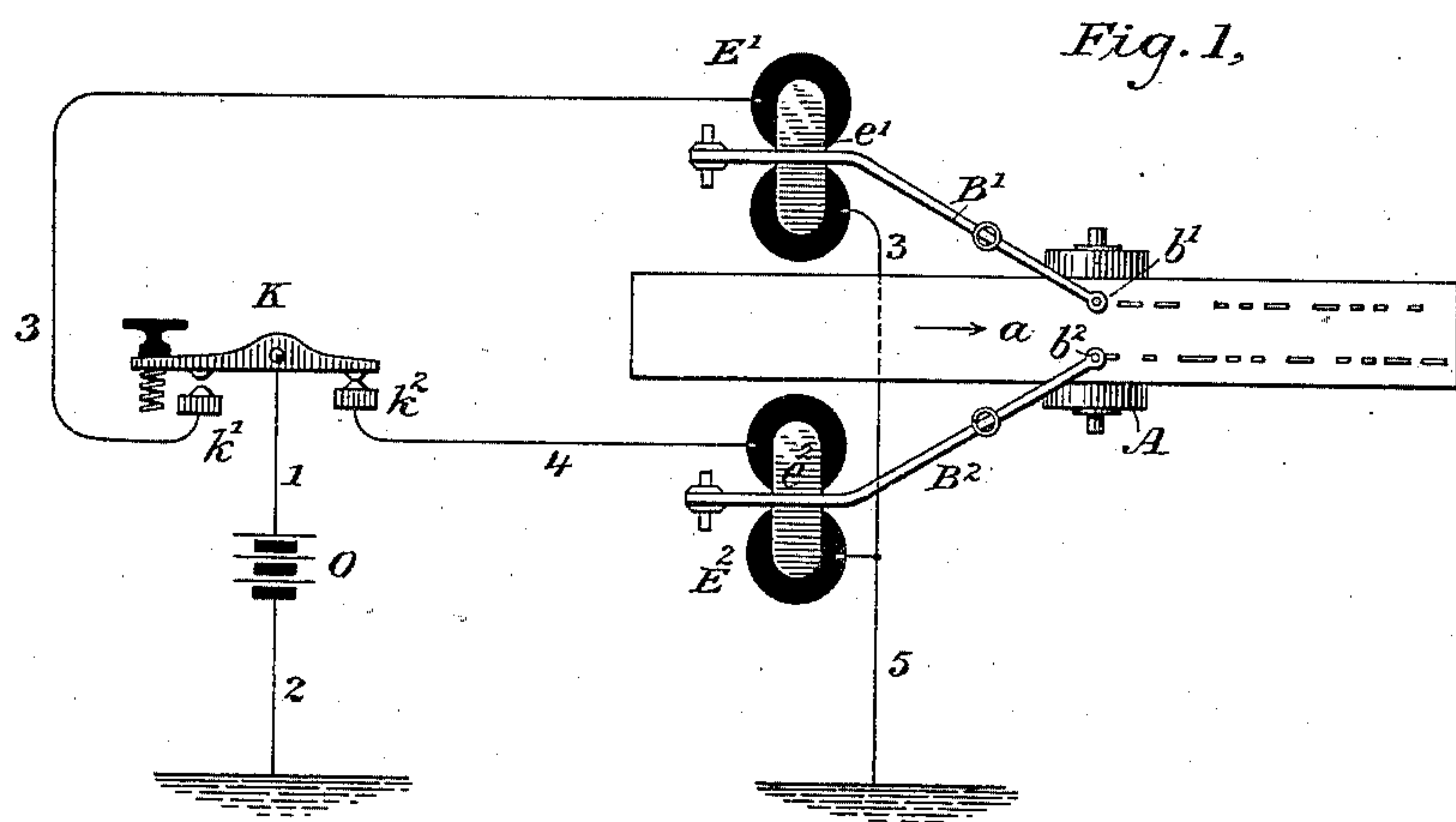


(No Model.)

C. WESTBROOK.
AUTOMATIC TELEGRAPHY.

No. 313,792.

Patented Mar. 10, 1885.



Witnesses

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AUTOMATIC TELEGRAPHY.

SPECIFICATION forming part of Letters Patent No. 313,792, dated March 10, 1885.

Application filed July 18, 1881. (No model.)

To all whom it may concern:

Be it known that I, CHERRICK WESTBROOK, a citizen of the United States, residing in Harrisburg, in the county of Dauphin and State of Pennsylvania, have invented certain new and useful Improvements in Automatic Telegraphy, of which the following is a specification.

My invention relates especially to a method of and apparatus for preparing messages for automatic transmission, and also to the method of transmission as accomplished by a peculiar form of transmitting-slip.

The object of the invention is to provide means for preparing a slip of paper or foil with embossments representing the message which is to be transmitted, in such a manner that each impulse employed for positive transmission shall be succeeded by an impulse of the opposite polarity, and that during the time which elapses between the transmission of two impulses of one polarity a current of the opposite polarity shall be sent upon the main line.

The invention consists in constructing two embossing-points in such a manner that each may be actuated and caused to emboss the paper or foil through the instrumentality of an independent electro-magnet, and in providing a circuit-closing key which when depressed will complete a circuit through one of its electro-magnets, and when raised through the other electro-magnet. This key is designed to be actuated in the manner of an ordinary Morse key, and the movements of one embossing-pen form impressions corresponding to the characters representing the message to be transmitted, while the movements of the other pen cause impressions to be made in a line parallel with the first-named impressions, but located opposite the spaces intervening between the successive impressions of the first-named line. It is designed that an embossed strip thus prepared shall be employed for transmission in connection with two circuit-closing points or levers, the one of which is designed, when actuated by an impression in the first-named line, to cause positive electric impulses to be transmitted, while the second line of embossments operates the

second circuit-closing point or transmitting-lever, and in like manner transmits negative electric impulses, or vice versa. The impulses employed thus for transmitting the message itself are each succeeded by an impulse of the opposite polarity, which endures until the commencement of the next succeeding impulse employed in the transmission of the message.

It has heretofore been proposed to employ two levers—the one operated by currents from one battery to print the dots of the Morse code, and the other operated together with the first by currents from a second battery to print the dashes. It has also been proposed to clear a main line of static charges by employing two transmitting-styluses. These styluses are respectively designed to follow two parallel spiral grooves formed in the surface of a revolving cylinder. In preparing a message the one stylus is pressed into its groove while the other is lifted, and vice versa. Two spiral lines of embossments are thus formed, and alternating currents of opposite polarity are transmitted to line therefrom when the message is being transmitted. The employment of metallic foil for this general purpose was proposed in a patent, No. 88,248, granted to me March 23, 1869.

In the accompanying drawings, which illustrate my invention, Figure 1 is a diagram illustrating the organization of the apparatus employed for preparing the transmitting-slip. Fig. 2 is a similar diagram, showing the method of employing the slip for transmission. Fig. 3 illustrates certain details of the construction of the transmitting-arms. Fig. 4 illustrates a modification in the organization of the transmitter.

Referring to the drawings, A represents an embossing-roller, over which it is designed to lead, by any suitable means, a strip of paper or metallic foil, or a paper faced with metallic foil, as may be desired, and at a regulated speed. Such a strip is designed to be employed for transmitting after it has been prepared with the message. The strip *a* passes beneath two embossing-points, *b'* and *b''*, which are respectively carried upon levers *B'* and *B''*. These levers respectively carry armatures *e'* and *e''*, which are applied to electro-magnets *E'* and

E^2 . Normally the levers and embossing-points are held upward by suitable springs, and do not cause depressions to be made upon the strip a . When, however, either electro-magnet is vi-
5 talized, the corresponding pen will make an indentation or groove in the strip.

For the purpose of actuating one or the other of the electro-magnets, the preparing-key K is employed. This key is provided with a
10 front contact-stop, k' , and a back contact-stop, k^2 . The key itself is connected by a conductor, 1, with one pole of a battery, o , the other pole of which is connected by a conductor, 2, with the earth. The front contact-stop is connected by
15 a conductor, 3, through the coils of an electro-magnet, E' , with a conductor, 5, leading to the earth. In like manner the back contact-stop, k^2 , is connected by means of a conductor, 4, through the coils of an electro-magnet, B^2 ,
20 and thus with the conductor 5. When the key K is depressed, the circuit of the battery is completed through the electro-magnet E' , and a corresponding impression will be made upon the slip a . When, however, the key is
25 raised, the circuit of the battery will be completed through the electro-magnet E^2 , and the recording-pen b^2 will make an impression upon the slip. In this way, by operating the key in the manner of an ordinary Morse key,
30 two lines of embossments will be formed upon the slip, the one line representing the message and the other the spaces intervening between the successive embossments in the first line. The two lines of embossments thus
35 prepared are employed for automatic transmission in the manner indicated in Fig. 2, when they are formed of non-conducting material, such as paper. Two levers, F' and F^2 ,
40 are respectively employed for following the lines f' and f^2 of embossments. The one of these levers, F' , is connected with the positive pole of a battery, O' , while the other lever or arm, F^2 , is connected with the negative pole of a similar battery, O^2 . The remaining poles
45 of these batteries are connected with the earth.

The strip of paper a is designed to be passed over the roller with the convex sides of the embossments upward, and presented to the
50 respective extremities of the arms F , so that each arm will be actuated whenever an embossment passes beneath its extremity.

Applied to the arm of each lever opposite the tracing-point is a contact-spring, as shown
55 at h' and h^2 , respectively. These contact-springs are designed to be pressed against a transmitting contact-roller, H , whenever the corresponding lever is actuated by an embossment. Normally, however, neither spring rests
60 against the roller.

For the purpose of readily adjusting the positions of the springs, suitable screws, p' and p^2 , extend through the levers against the springs, and are adapted to adjust them a greater or
65 less distance toward or from the roller.

The contact-roller H is of essential impor-

tance in this system for the purpose of obtaining from the embossments as reliable and sure an electrical connection as possible.

The force available for closing a circuit by
70 means of the embossments is limited to the capacity of the embossments to resist the pressure of the lever upon them.

It is well known that a rubbing or frictional contact secures a more perfect electrical con-
75 nection than does a striking or stationary contact.

By the use of the rollers H a broad surface-contact is secured, and the friction between the roller and the contact-spring keeps the sur-
80 faces of both bright and clean.

Any suitable means may be employed for causing the roller H to revolve at the required
rapidity—such, for instance, as a train of gear connected with the motor employed for actu-
85 ating the drum over which the strip of embossed paper is carried.

The transmitting-roller is designed to be connected with a main line, L , of a telegraphic system, and at the receiving-station of this
90 system any suitable form of receiving-instrument may be employed—such, for instance, as a chemical recorder, (shown at R .) Such an instrument is of well-known construction, and need not herein be specifically described, it
95 being understood that it will record only the positive currents transmitted from the main line. It will be seen, therefore, that by the movement of the transmitting-slip beneath the points of the levers F first one lever and then
100 the other will cause the circuit-connections of the corresponding battery to be completed with the main line, so that for each embossment in the line f' a positive current will be sent to line, while a negative current will be
105 sent to line each time an embossment in the line f^2 passes beneath the lever F^2 . The positive impulses are recorded upon the receiving-strip of chemical paper in the usual manner, while the negative impulses which intervene
110 between the positive serve to clear the line, or, in other words, to counteract the static charge and discharge which would otherwise occur. The negative impulses do not effect a record, as they traverse the paper stylus in
115 the wrong direction.

When it is designed to employ a metallic slip, or a paper slip faced with metal, it will be desirable to employ some such transmit-
120 ting device as is illustrated in Fig. 4.

The levers F^3 and F^4 are respectively designed to be actuated by the embossments in the same manner as described with reference to Fig. 2, and the one lever is connected with the positive pole of the battery O^3 , while the
125 other is connected with the negative pole of the battery O^4 ; but the transmitting-slip itself is connected with the main line. When, therefore, an embossment in either line touches the corresponding transmitting-point, the circuit
130 will be completed through the main line, and an impulse of the corresponding polarity will

be sent. These impulses are employed for transmitting the message and for clearing the line in precisely the same manner as described with reference to Fig. 2.

5 I claim as my invention—

1. The combination, substantially as here-
inbefore set forth, with two embossing-pens,
of an electro-magnet applied to each of said
embossing-pens, a battery and a transmitting-
10 key having a front and a back contact-stop,
and circuit-connections, substantially such as
described, from the front contact-stop through
one of said electro-magnets, and from the back
contact-stop through the other of said elec-
15 tro-magnets.

2. The combination, substantially as here-
inbefore set forth, of a transmitting arm or
lever, means, substantially such as described,
for passing an embossed transmitting-slip be-
20 neath one end of said lever, a contact-point
carried upon said lever, and a revolving
contact-surface against which said point is
caused to impinge through the agency of the
embossments upon the transmitting-slip, sub-
25 stantially as described.

3. The combination, substantially as here-
inbefore set forth, of a transmitting arm or

lever, means, substantially such as described,
for actuating said lever through the agency of
an embossed transmitting-slip, a yielding con- 30
tact-spring carried upon said lever, and a re-
volving contact-roller against which said con-
tact-spring is caused to impinge when said le-
ver is actuated.

4. The combination, substantially as here- 35
inbefore set forth, of a transmitting arm or
lever, means, substantially such as described,
for actuating said lever through the agency
of an embossed transmitting-slip, a yielding
contact-spring carried upon said lever, and 40
means, substantially such as described, for
adjusting the position of said contact-spring,
a contact-roller against which said contact-
spring is caused to impinge when said lever
is actuated, and means, substantially such as 45
described, for revolving said roller.

In testimony whereof I have hereunto sub-
scribed my name this 14th day of July, A. D.
1884.

CHERRICK WESTBROOK.

Witnesses:

EDWD. MOBERG COOPER,
SAMUEL W. FLEMING.