(No Model.) 2 Sheets—Sheet 1.

# G. B. SCOTT.

## PRINTING TELEGRAPH.

No. 365,705. Patented June 28, 1887.

*Fig. 1.*

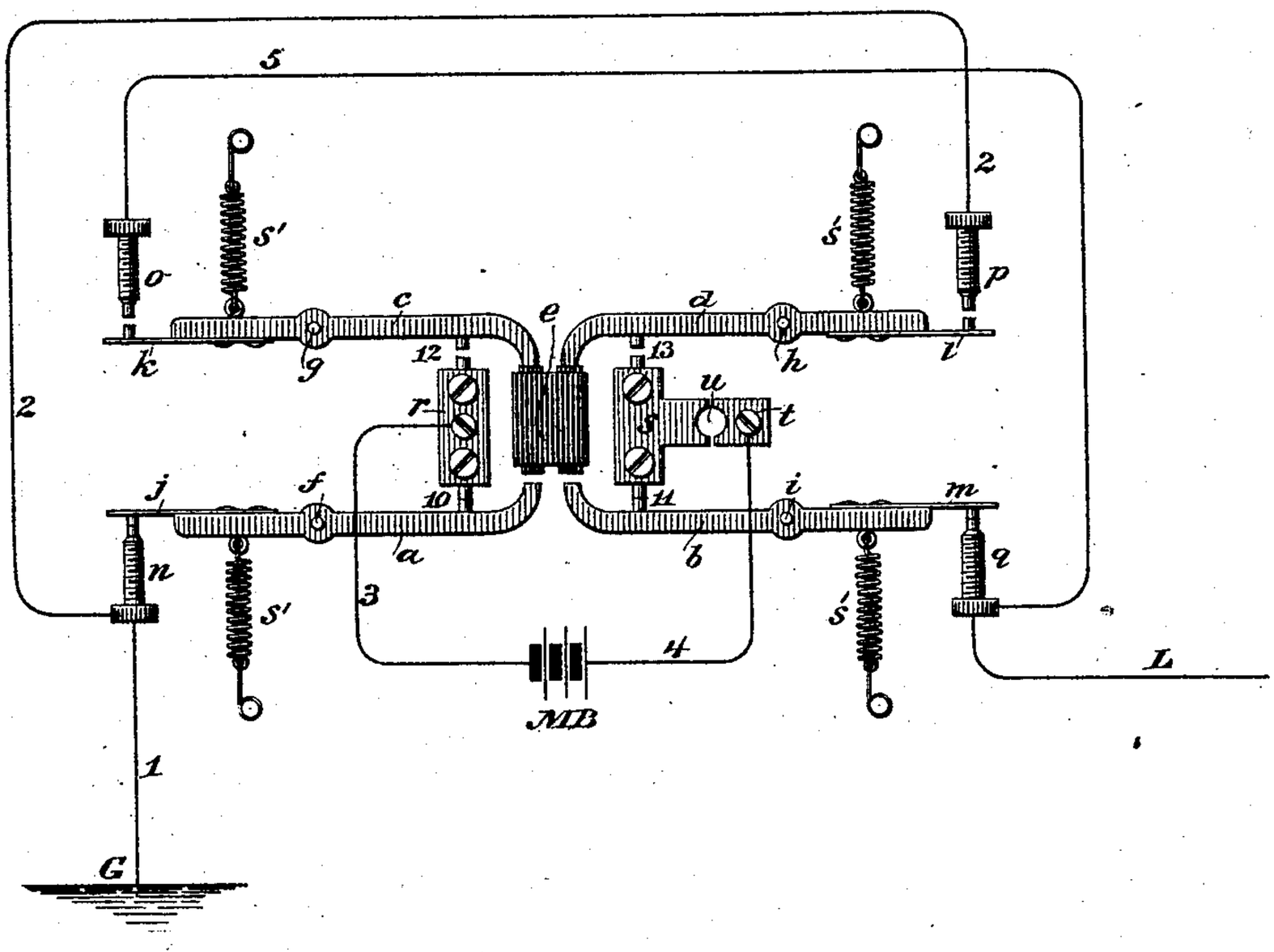
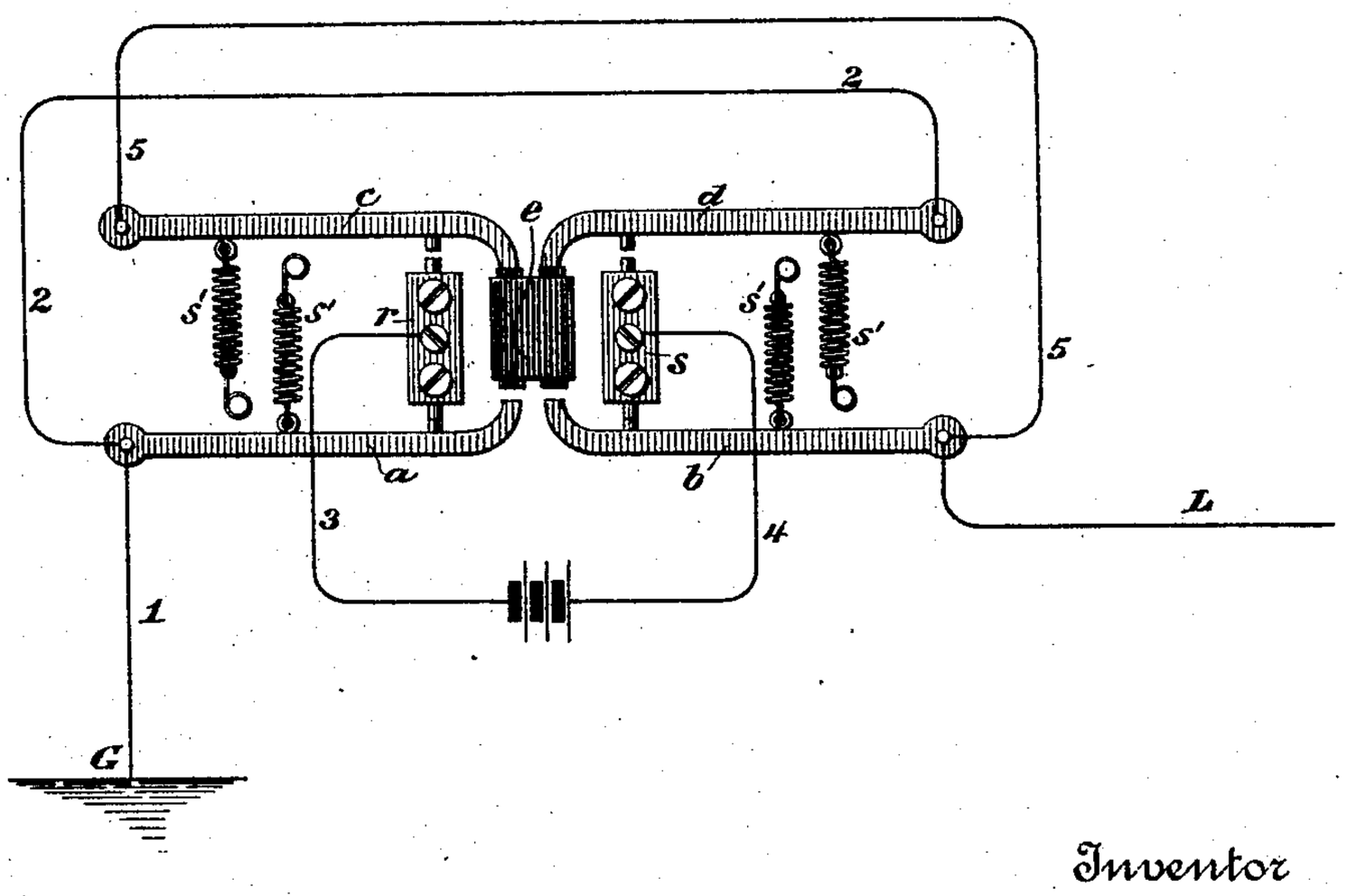



*Fig. 5.*




Witnesses

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(No Model.) 2 Sheets—Sheet 2.

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## PRINTING TELEGRAPH.

No. 365,705. Patented June 28, 1887.

*Fig. 4,*

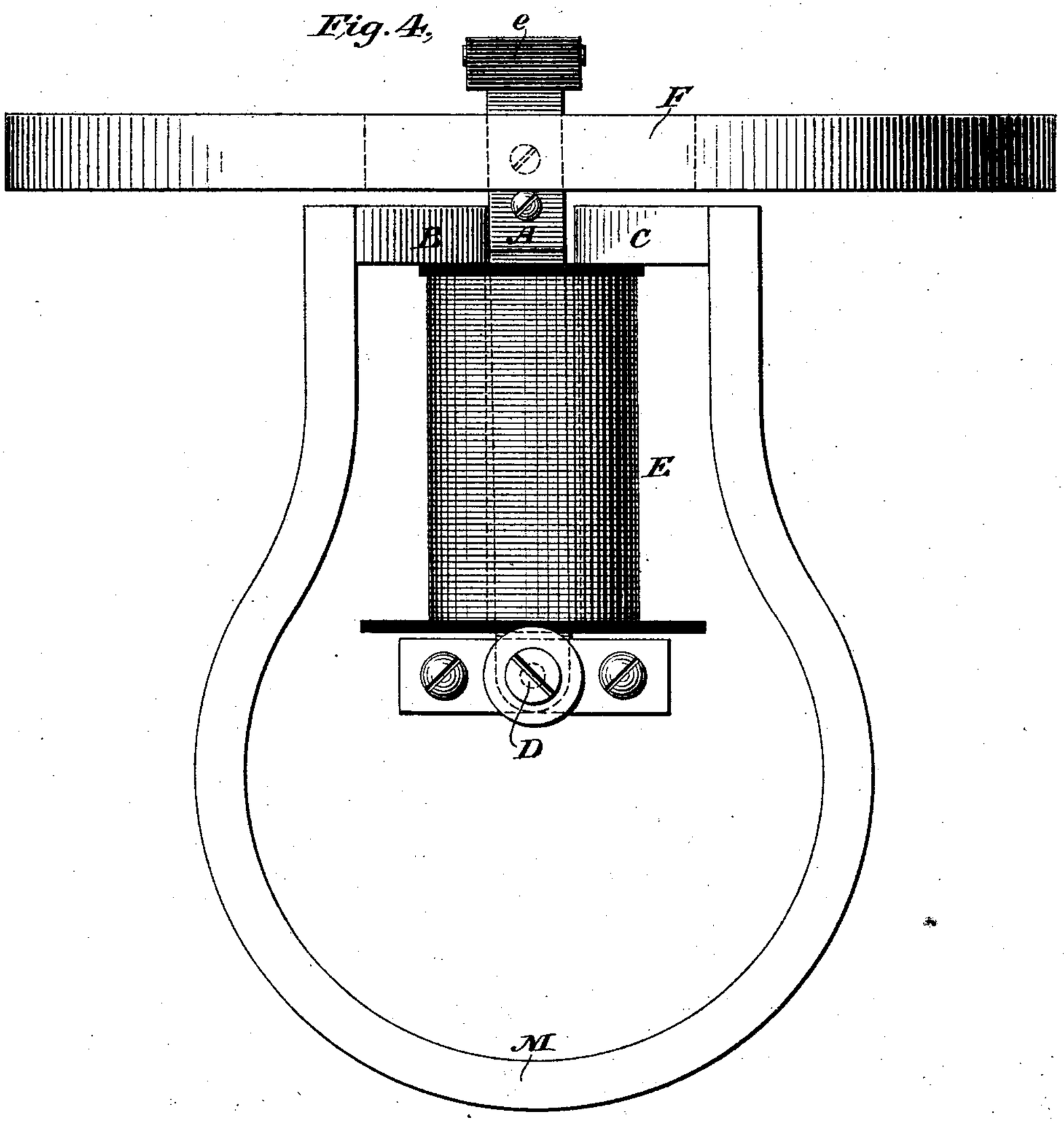



*Fig. 2,*

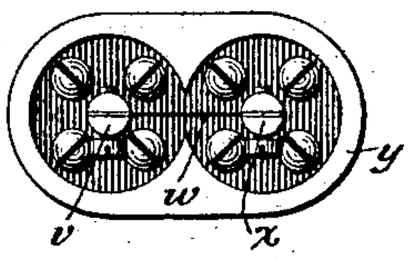
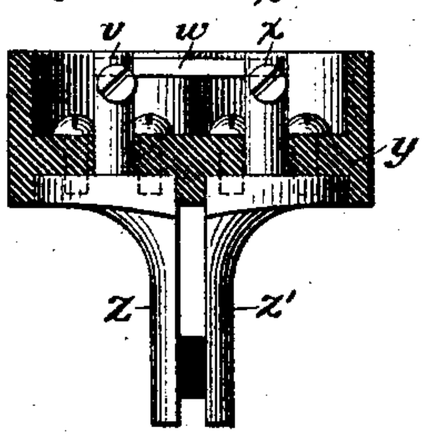



*Fig. 3,*

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# UNITED STATES PATENT OFFICE.

GEORGE B. SCOTT, OF BROOKLYN, NEW YORK, ASSIGNOR TO THE WESTERN UNION TELEGRAPH COMPANY, OF NEW YORK.

## PRINTING-TELEGRAPH.

SPECIFICATION forming part of Letters Patent No. 365,705, dated June 28, 1887.

Application filed February 2[illegible], 1887. Serial No. 229,132. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE B. SCOTT, of the city of Brooklyn, county of Kings, and State of New York, a citizen of the United States of America, have made a new and useful Improvement in Circuit-Breakers and Pole-Changers for Printing-Telegraph Transmitters, of which the following is a specification.

In printing-telegraph systems in which the type-wheels are advanced step by step by short electrical impulses strong electrical currents are employed and the battery is rapidly placed to and removed from line, or where reversed impulses are used, instead of pulsations of the same polarity, the battery-poles are rapidly reversed.

The difficulty arising from the spark occurring upon the removal of the battery from circuit, or upon the removal of a positive pole from the circuit and substituting a negative battery-pole therefor, has heretofore been overcome by causing several interruptions to be simultaneously made along the circuit.

My invention consists in the employment of improved apparatus for causing such simultaneous interruptions; and it further consists in the employment of a removable safety-plug through which the circuit is normally completed, and which consists of two metallic parts, which are joined by a tin-foil strip of such proportions that an abnormally strong current will fuse and destroy the tin-foil and disrupt the circuit.

Referring to the accompanying drawings, Figure 1 is a diagrammatic view representing a part of my invention when embodied in a pole-changer of a printing-telegraph transmitter. Fig. 2 is a plan view of the top of my safety-plug, in which a fusible tin-foil strip is employed. Fig. 3 is a side view of said plug. Fig. 4 represents a side view of an electro-magnetic apparatus for controlling the pole-changing apparatus shown in Fig. 1. Fig. 5 is a modification of apparatus shown in Fig. 1, in which the circuit is only broken at one point by the movement of a contact-lever, instead of at two points.

Referring to Fig. 1, *a b c d* are contact-levers, which are pivoted, respectively, at points *f i g h*, and each of said levers is provided with a retracting-spring, *s'*.

*r* and *s* are fixed metallic anvils, and *t* is a separate stationary block of conducting material arranged in close proximity to anvil *s*, and is separated therefrom by the circular opening *u*, within which a removable safety-plug is inserted to complete the circuit. The poles of the main battery M B are respectively joined with anvil *r* and block *t* by means of wires 3 and 4. Levers *a b c d* are respectively provided with contact-springs *j m k l*, which are adapted to be brought into contact with and removed from anvils *n q o p* upon the to and-fro movement of the vibrating arm A, Fig. 4, which carries the insulating-head *e*. By the movement of the insulating-head *e* to the position shown in Fig. 1 levers *c d* will have broken contact with the anvils *r* and *s* at points 12 and 13, and springs *k* and *l* will have been separated from anvils *o* and *p*, and at the same time the retracting-springs of levers *a* and *b* will have caused contact to be made between lever *a* and anvil *r* and between lever *b* and anvil *s* at points 10 and 11; also, contact-springs *j* and *m* will have made contact with anvils *n* and *q*. Anvils *n* and *p* are joined by the wire 2, while anvils *o* and *q* are joined by wire 5. Anvil *n* is connected by wire 1 to ground G, and anvil *q* is in connection with the main line L. If, now, the vibrating head *e* be moved to the other extreme position of vibration, levers *c* and *d* will be brought into contact with anvils *r* and *s* at points 12 and 13, while contact at points 10 and 11, between arms *a* and *b* and anvils *r* and *s*, will be broken. Likewise, springs *k* and *l* will be brought in contact with anvils *o* and *p*, while springs *j* and *m* will be separated from anvils *n* and *q*.

The safety-plug for joining anvil *s* and block *t* when placed in the aperture *u* consists of two metallic pieces, *z z'*, which are attached to an oblong gutta-percha body, *y*, in the top of which is worked a cavity, into which supporting-wires *v* and *x* project. These supporting-wires *v* and *x* are respectively joined to the metallic pieces *z z'*, and are connected together by a fusible tin-foil strip, *w*, or a strip of equivalent material, of such proportions as to be readily destroyed by an abnormally strong current. Thus when said plug is inserted in the cavity *u* the circuit will be

protected against any abnormally strong current which is sufficiently great to melt or fuse the strip *w*. This arrangement I find of great convenience, since the fusible strip after being destroyed may be easily replaced in a removable plug, as the plug may be removed and taken to a repair-shop.

In Fig. 4 F is a gutta-percha base, upon the top of which is arranged the pole-changing apparatus shown in Fig. 1. To the lower side of said base is connected a permanent magnet, M, with pole-pieces B and C, between which the armature A vibrates. Armature A projects upward through an opening in the base F and carries the insulating-head *e*. The armature A is supported upon the pivot D and within the axial opening of electro-magnet E. The coils of electro-magnet E are included in a local circuit, which is provided with any suitable circuit-breaker for operating the armature A and the pole-changing device shown in Fig. 1.

When the safety-plug is inserted in opening *u*, with the apparatus in the position shown in Fig. 1, the circuit from ground will be as follows: Wire 1, anvil *n*, spring *j*, lever *a*, anvil *r*, wire 3, battery M B, wire 4, connecting-block *t*, the safety-plug, anvil *s*, lever *b*, spring *m*, and anvil *q*. It will now be seen that this circuit is closed at four points, and that it will be simultaneously broken at each and all of said points upon the movement of the vibrating head *e*.

In the second position of the vibrating head *e* the circuit from ground G to the line L will be as follows: Wire 1, anvil *n*, wire 2, anvil *p*, contact-spring *l*, lever *d*, anvil *s*, the safety-plug, block *t*, wire 4, battery M B, wire 3, anvil *r*, lever *c*, contact-spring *k*, anvil *o*, wire 5, and anvil *q*. Following either movement of the vibrating head *e*, therefore, the circuit will be simultaneously broken at four points.

If it were desired to merely open and close the main-line circuit and not to reverse the battery-poles of M B, either the two upper or the two lower levers might be dispensed with. For example, if the levers *c* and *d* were removed, the circuit could be broken at four points upon bringing the vibrating head *e* in contact with the arms *a* and *b*. By employing the two arms *a* and *b*, as has just been seen, the circuit would be broken at four points. If the lever *b* were dispensed with, the circuit would be broken at two points—that is to say, at points 10 and at the anvil *n*.

Instead of employing two levers on each side of the vibrating head *e*, three or more levers might be used and the circuit broken at twice as many points as there are levers employed; also, as shown in Fig. 5, the anvils *n o p q* and springs *j m k l* may be dispensed with, and the circuit so modified as to cause each contact-lever to open and close the line at one point only, instead of at two points.

What I claim, and desire to secure by Letters Patent, is—

1. In a printing-telegraph transmitter, the combination of the vibrating arm *e*, contact-levers *a b*, anvils *r s*, contact springs *j m*, anvils *n q*, retracting-springs *s'*, battery M B, ground-wire 1, and main line L.

2. In a printing-telegraph transmitter, the combination of the vibrating arm *e*, contact-levers *a b c d*, anvils *r s n o p q*, retracting-springs *s'*, main battery M B, ground-wire 1, wires 2 and 5, and main line L, as and for the purpose described.

3. In a printing-telegraph transmitter, the combination of a main-line battery, M B, contact-levers *a b c d*, contacts *n o p q*, anvils *r s*, and vibrating arm *c*.

4. A safety-plug for completing an electrical circuit, consisting of metallic pieces *z z'*, forming the shank of the plug, a hollowed-out head, *y*, to which the shank-pieces are attached, conductors *v x*, extending into said hollowed-out space, and a strip, *w*, of tin-foil or other equivalent material arranged within said hollowed-out space in the head *y* and joining conductors *v x*, substantially as described.

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Witnesses:
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