C. E. DAVIES.

ELECTRICAL CIRCUIT BREAKING AND MAKING DEVICE FOR TELEGRAPHIC PURPOSES.

APPLICATION FILED NOV. 27, 1907.

916,918. Patented Mar. 30, 1909.

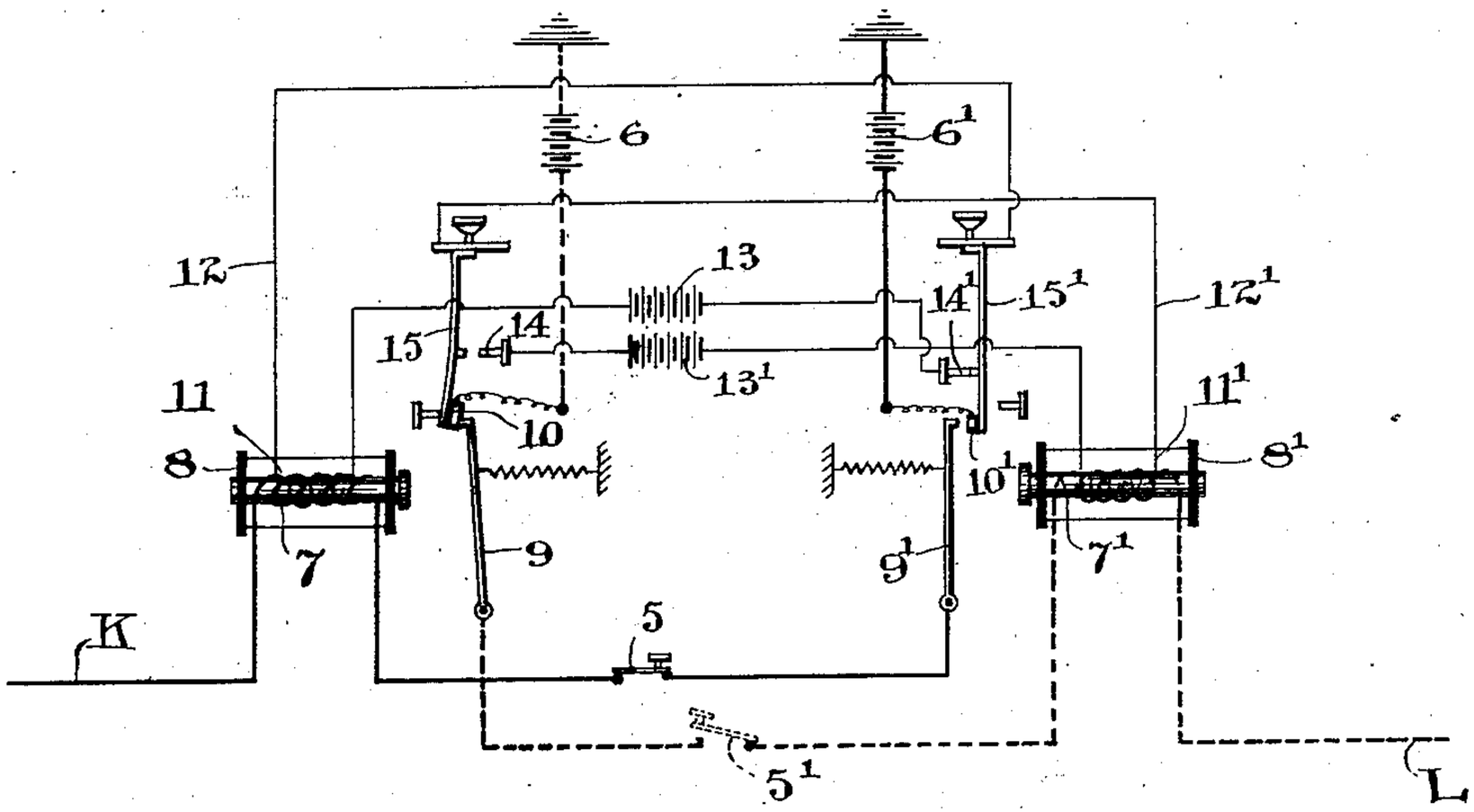

FIG. I.

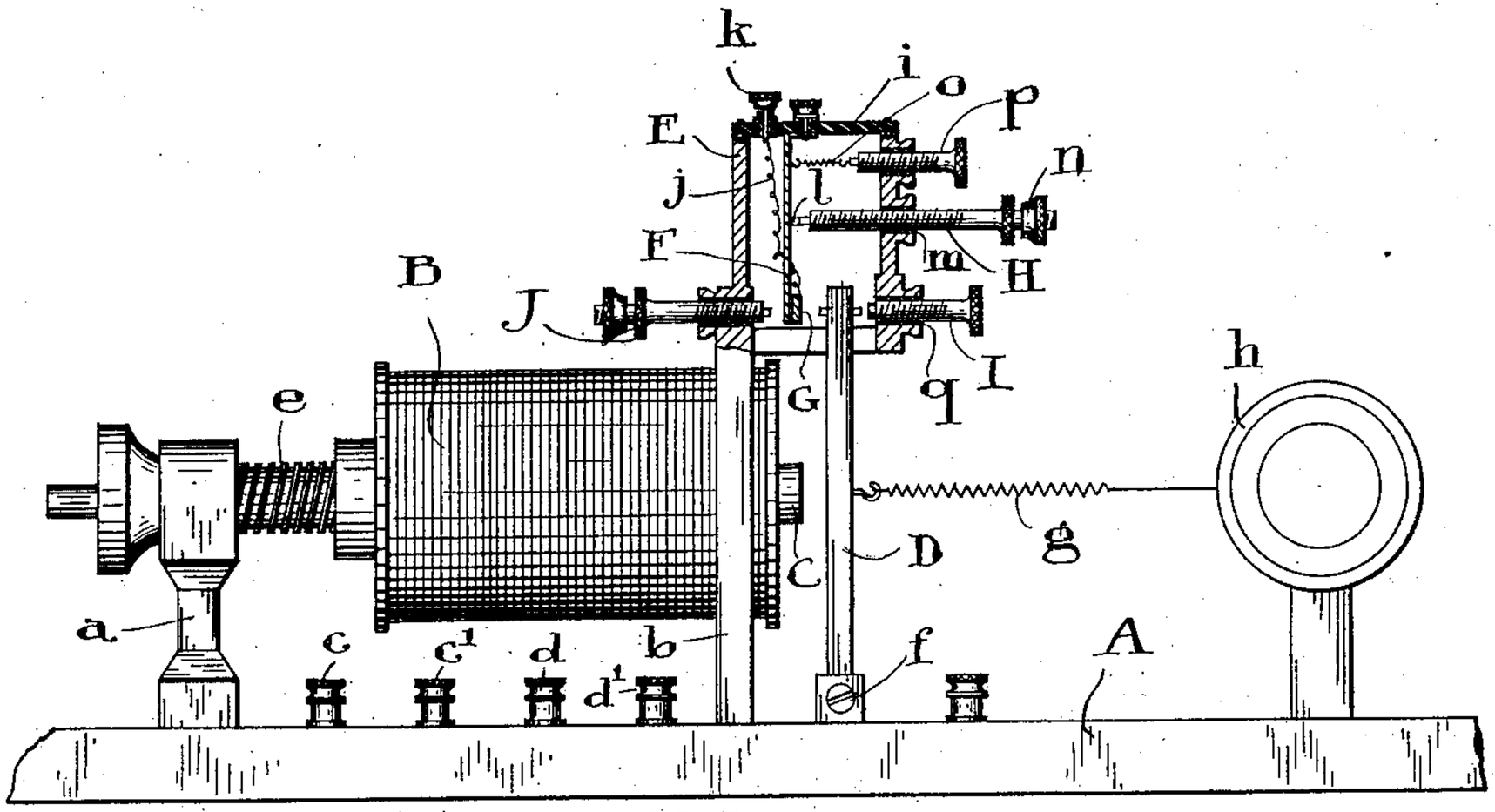

FIG. 2.

WITNESSES

Wm. G. Wyman

J. H. Glenn

INVENTOR

C. E. DAVIES

BY Fred'k P. Fish & Co.

ATT'Y.

UNITED STATES PATENT OFFICE.

CHARLES EDWARD DAVIES, OF OTTAWA, ONTARIO, CANADA.

ELECTRICAL CIRCUIT BREAKING AND MAKING DEVICE FOR TELEGRAPHIC PURPOSES.

No. 916,918. Specification of Letters Patent. Patented March 30, 1909.

Application filed November 27, 1907. Serial No. 404,146.

To all whom it may concern:

Be it known that I, CHARLES EDWARD DAVIES, of Ottawa, in the county of Carleton, Province of Ontario, Canada, have invented certain new and useful Improvements in Electrical Circuit Breaking and Making Devices for Telegraphic Purposes, of which the following is a specification.

My invention relates to improvements in electrical circuit breaking and making devices for telegraphic purposes, and the general object of the invention is to provide a device of this class having exceedingly simple and efficient means for simultaneously breaking one circuit and making another circuit.

In particular, the objects are to combine a pair of the devices with an arrangement of circuits to form a repeater, in which the number of instruments employed may be reduced and which will operate effectually under all conditions.

The details of the invention are described more fully in the following specifications and accompanying drawings, and specifically set forth in the claims.

In the drawings, Figure 1 is a diagrammatic view illustrating the connection of two of the instruments as a repeater. Fig. 2 is a side view of the actual construction of the instrument itself.

Referring, first to Fig. 2 A represents a suitable base having a magnet B supported thereon by brackets *a* and *b*, and provided with two sets of windings connected respectively to the pairs of binding posts *c*, *c'*, *d*, and *d'*, and through the center of the magnet a core C extends adjustable by means of a screw *e*. In front of the magnet an armature D of suitable magnetic material is provided, and pivoted at *f* adjacent to the base. This magnet is normally retained in its position farthest removed from the magnet by means of a tension spring *g* connected to a suitable bracket *h* on the base. Above, and slightly in front of the magnet, a bracket E is provided having a top member *i* of insulating material, which supports a flexible spring lever F which carries at its extremity a contact point G which is suitably insulated from the remainder of the lever and has connected thereto a fine wire *j* which leads to a binding post *k*. The contact point G is adapted to be engaged by the end of the armature D when drawn toward the magnet. The upper part of the lever F carries a second contact point *l* which is adapted to coact with a similar point carried on the end of a screw H supported by an insulating bushing *m* in the bracket E and having a binding set-screw *n* at the extremity thereof. In addition to the tension of the spring metal in the lever F a small spring *o* is connected to the upper part thereof, and to a screw *p* extending through an insulating bushing in the frame, whereby the tension may be accurately adjusted.

In the bottom of the frame E a screw I may be supported in an insulated bushing *q*, the end of which is adapted to form a back stop for the armature D and on the opposite side a screw J may be provided, adapted to contact with the reverse side of the spring lever F at once affording a front stop for the same and means for making and breaking an auxiliary circuit should it be so desired.

It will be observed in connection with the mechanical structure of the instrument itself that the combination of the spring operating the armature D, the spring lever F, and tension spring *o* connected to the same, afford together an exceedingly accurate means of adjusting and regulating the movements of the lever and armature.

Referring now to Fig. 1, which diagrammatically shows the connection of two of the instruments to form a repeater, K and L represent the east and west main lines respectively having keys 5, 5' and batteries 6, 6' therein. Each of these lines are connected to the windings 7, 7' on the electro-magnets 8, 8' forming part of the two instruments. Each main line circuit after passing through one winding of the magnet of one instrument is then led to the opposite instrument and connected to the armature 9 or 9', thereof, and from thence through the contact point 10 or 10' to the battery 6 or 6' to the ground. The second windings 11', 11 on the magnets 8, 8' are connected to local circuits 12, 12' which include the batteries 13, 13' and are completed through contact points 14, 14' and the spring levers 15, 15', the electromagnet 11 or 11' and the lever 15 or 15' in each local circuit, being thus on opposite instruments; that is to say, tracing out the local circuit, it will first pass through the magnet of one instrument, then pass to the spring armature of the other instrument, back through the contact point coöperating therewith, through its own battery and from thence to the electromagnet again.

In operation, when the line is at rest both

the armatures 9, 9′ will be kept closed by the current in the main lines operating through the windings 7, 7′ of the electro-magnets. When however, one line is open to give a signal, which is the condition illustrated in Fig. 1, where the west line is open, the armature 9′ will be released breaking the east line, but, at the same time as this is done, the local circuit 12 is completed, preventing the magnet from becoming demagnetized and continuing to hold the armature 9 in position, thus maintaining the continuity of the main line L through the armature 9 and contact point 10. From this it will be seen that whenever one of the main lines are broken to give a signal the corresponding local circuit is automatically completed and operates to prevent the breaking of the main line giving the signal through the deënergizing of the magnet, which would otherwise result from the breaking of the opposing main line.

The manner of transmitting the signal from one line to the opposing line is particularly to be noted. It will be observed that whenever a break is made in one line, for instance L, the deënergizing of the magnet 8′ will result in a break between the armature 9′ and contact point 10′, which will break the main line K. When the line L is again completed, the magnet 8′ will be energized again completing the circuit L, the make and break in the opposing line being at all times effected by an armature operated directly by the current in the line transmitting the signal.

It will be observed that the number of instruments in the repeater has been very much reduced, the one set of levers serving for both the main and the local circuits owing to the fact that the magnets 8 and 8′ carry two windings. As explained hereinbefore, the adjustment of the instrument can be made very fine.

While the invention has been described herein with great particularity of detail, yet it will be readily understood that in carrying out the construction of the same, changes may be made, within the scope of the appended claims without departing from the spirit of the invention.

What I claim as my invention is:—

1. In a telegraph instrument, and in combination, an electro-magnet, a pivoted armature disposed in front of the same, spring means for retaining the armature in retracted position, a separately movable circuit controlling member adapted to be engaged by the armature during movement and to be moved thereby, and means coöperative with the circuit closing member for completing a circuit through the armature, during energization of the magnet, and breaking another circuit when moved by the armature, the normal position of the said armature being disengaged from the armature.

2. In a telegraph instrument, and in combination, an electro-magnet, a pivoted armature disposed in front of the same, spring means for retaining the armature in retracted position, a separately movable, circuit controlling member formed of spring metal, adapted to be engaged by the armature during movement and to be moved thereby, and means coöperative with the circuit closing member for completing a circuit through the armature, during energization of the magnet, and breaking another circuit when moved by the armature, the normal position of the said armature being disengaged from the armature.

3. In a telegraph instrument, the combination with the tiltable armature, a magnet operating the same, of a spring lever having the end thereof adapted to be engaged by the armature in its movement toward the magnet, a frame supporting the spring lever, a screw carried thereby, and insulated therefrom and adapted to normally engage the upper part of the lever, which lever is adapted to be moved out of contact with the screw by the operation of the armature, and an adjustable back stop for the armature.

4. In a telegraph instrument, the combination with the tiltable armature, a magnet operating the same, of a spring lever having an insulated contact point at the end thereof, adapted to be engaged by the armature in its movement toward the magnet, supporting means for the spring lever, an insulated screw normally engaging the upper part of the spring lever, which lever is adapted to be moved out of engagement therewith by the movement of the armature, and an adjustable screw having the end thereof adjacent to the back of the spring lever and adapted to contact with the same when the lever is moved by the armature.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

CHARLES EDWARD DAVIES.

Witnesses:

R. S. SMART,

J. H. GLEN.