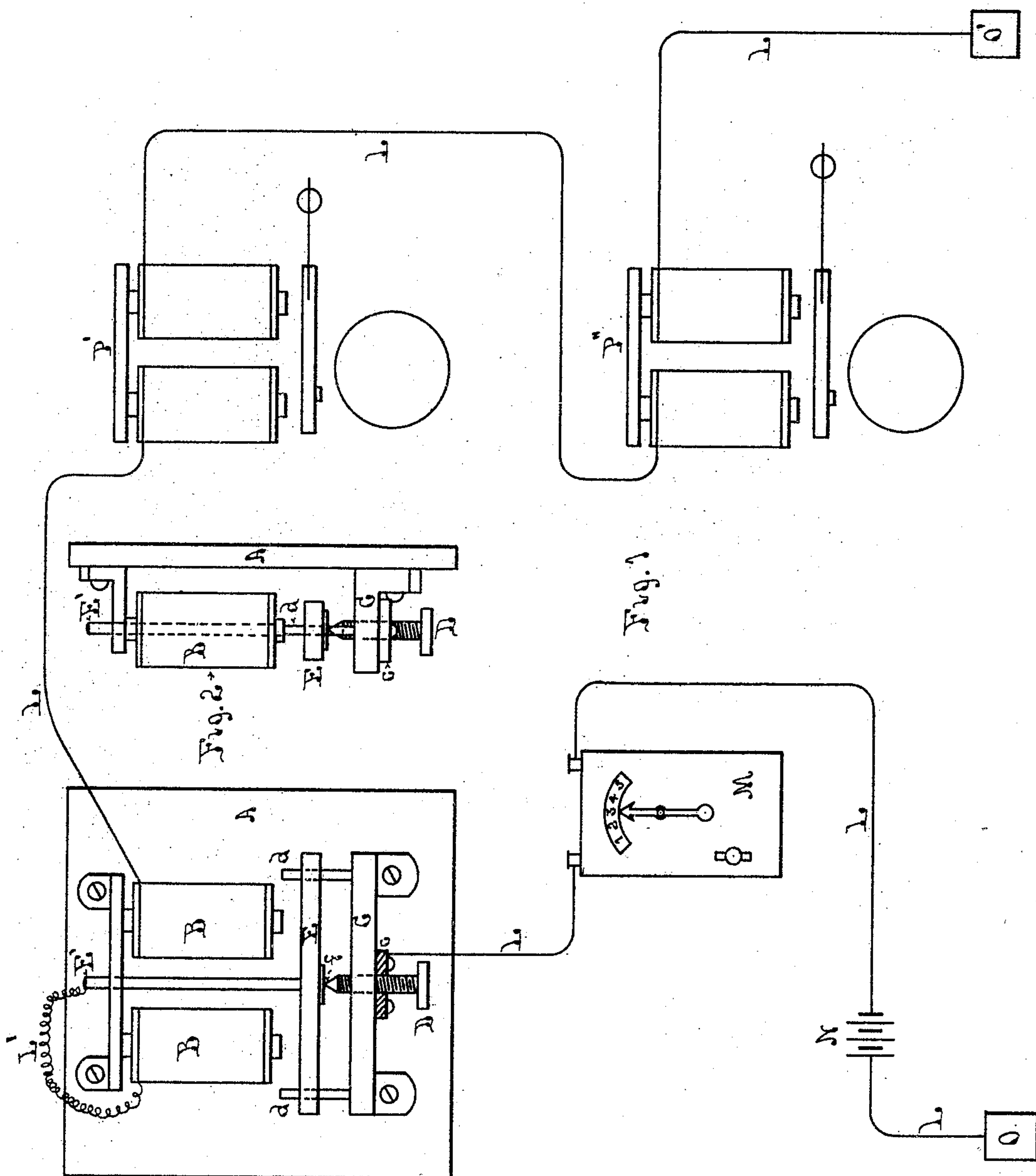


(Model.)

J. B. CURRIER.  
ELECTRICAL SIGNALING APPARATUS.

No. 491,531.

Patented Feb. 14, 1893.



Witnesses

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# UNITED STATES PATENT OFFICE.

JACOB B. CURRIER, OF LOWELL, MASSACHUSETTS, ASSIGNOR TO THE CURRIER TELEPHONE BELL COMPANY, OF MASSACHUSETTS.

## ELECTRICAL SIGNALING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 491,531, dated February 14, 1893.

Application filed December 15, 1881. Serial No. 47,978. (Model.)

*To all whom it may concern:*

Be it known that I, JACOB B. CURRIER, of Lowell, in the county of Middlesex and State of Massachusetts, have invented a certain new and useful Improvement in Electrical Machines, of which the following is a specification.

My invention relates to that description of electrical mechanisms commonly called regulators which are used for putting a certain amount of resistance into electrical circuits, and it consists in so constructing a regulator that it offers no resistance above that of its magnet to the passage of the electric current over the circuit until it has reached a certain definite degree of force or power, when the regulator automatically commences to operate, and prevents any greater force being exerted upon the magnets in the circuit, by the interposition of an air bridge no matter what battery power is applied thereon. The ordinary rheostat interposes a certain definite amount of resistance to the passage of the electric current over a circuit in which it is placed at all times and the surplus of electric force over its resisting power only is available acting through the magnets in circuit. Any increase of the battery power produces a corresponding increase of available magnetic power and vice versa. In many instances it is desirable to interpose comparatively no resistance to the electric current up to a certain point and effectually shut off the excess of electric force above that point. My invention accomplishes this result. In practice I apply it to a circuit of electric call bells such as are shown in my patent of August 30, 1881, No. 246,374, but it may be made available for other purposes.

In the drawings: Figure 1. is a front elevation of my automatic regulator applied to a circuit of electric bells. Fig. 2. is a side elevation of the automatic regulator.

A is a base of wood or other suitable non-conducting material.

B. is an electro magnet attached thereto.

C. is a bar of metal attached to the base A. To the bar C. is connected by insulating material in any well-known manner a metallic nut *c* fitted to the screw D. The bar C. may itself be of wood or ivory or other electric

non-conducting material. From the bar C. project upward two short rods *dd* upon which slides freely up and down the soft iron bar E. which carries the upright metal rod E' attached to it and sliding through the cross-bar of the magnet. The bar E. rests upon the point *f* of the screw D which works up and down in the nut *c* by which it is supported. It is found preferable to form the contact points of the screw D and bar E of platinum.

L. L. is the electric circuit. Starting from the ground O. it leads to the battery N and thence to the caller M, the latter being such as is described in my above mentioned patent and being shown cased, and which is so well known as not to require a description of its internal mechanism. From the caller M the circuit leads to the screw D. thence through bar E and rod E' and by the wire L' through the magnet B. out to the several stations P' P'' and to the ground O' beyond them. The circuit passes through the call bell magnet at each station as shown. These call bells are substantially such as are shown in my said patent, and applications for other patents filed by me and are too well known to require further description.

The operation of the invention is as follows: Let it be desired to supply the circuit with only a given amount of electric force, it being of course assumed that the battery is capable of affording an excess of power over that amount. It is first ascertained by experiment at what distance from the magnet B. the bar E must be set by means of the screw D to prevent its being lifted by the magnet, until the desired amount of electric current flows over the circuit, and the bar E is set at that distance from the magnet.

Various advantages result from the use of my automatic regulator in the circuit. For instance, it is found that when it is adjusted to allow a single bell magnet to receive the maximum amount of electric current desirable to operate the bell, any number of other similar bell magnets may be introduced into the circuit and each will receive a like amount of electric current, until the battery power is reduced by their combined resistance below the limit for which the automatic regulator is set, when the governor



ceases to operate, and allows the whole current to flow over the circuit. In like manner, this governor automatically adjusts itself so as to allow only a certain maximum amount of battery current to act upon each bell, magnet, whether the circuit from variations of weather, or other causes, presents more or less resistance to the passage of the current. The advantages of its automatic operation are so manifest as to need no further amplification. Instead of a battery circuit it may be used upon a circuit with any kind of well known magneto electric or dynamo machine to generate an electric current.

What I claim as new and of my invention is:

1. The combination of an electric circuit, and an automatically self adjusting governor placed therein, formed of an electro-magnet and its armature both located in the main circuit arranged to interpose an air bridge in it under the influence of the electric current and regulate the latter, substantially as described.

2. The combination of the electro magnet, B, the armature bar E, its electric contact point *f* sustaining the bar, and the electric circuit passing through said contact point, bar and magnet, substantially as described.

3. The combination of the electro magnet B, the armature E, its electric contact point *f* sustaining the same, and mounted on adjusting mechanism arranged to adjust the armature nearer to or farther away from the magnet, and the electric circuit passing through said contact point, bar and magnet, substantially as described.

4. In combination with an electric circuit provided with a series of individual call bells, the automatically self adjusting regulator, arranged to interpose an air bridge in the circuit to prevent an excess of current, substantially as described.

JACOB B. CURRIER.

Witnesses:

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BENJ. PATCH.