

(No Model.)

J. D. BISHOP.  
ELECTRIC ANNUNCIATOR.

No. 429,599.

Patented June 10, 1890.

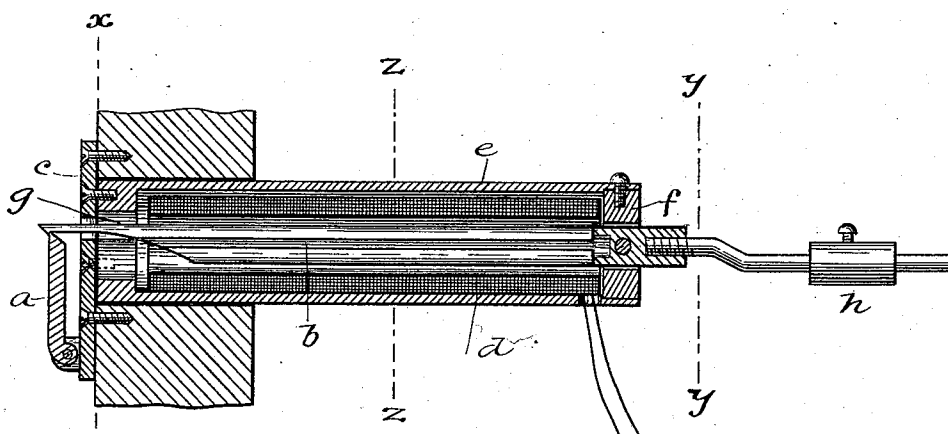


Fig. 1.

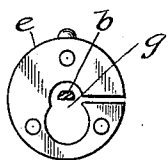


Fig. 2.

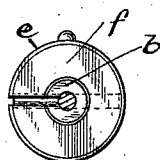


Fig. 3.

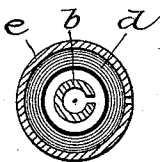


Fig. 4.

Witnesses:

Chas. E. Hawley.  
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By George P. Barton  
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# UNITED STATES PATENT OFFICE.

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## ELECTRIC ANNUNCIATOR.

SPECIFICATION forming part of Letters Patent No. 429,599, dated June 10, 1890.

Application filed February 3, 1890. Serial No. 339,047. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES D. BISHOP, a subject of the Queen of Great Britain, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Electric Annunciators, (Case I,) of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

In telephone exchanges where the annunciators of different telephone-lines are grouped in close proximity to one another it is found that currents like the undulatory voice currents sent through one annunciator will be, to a certain extent, reproduced in the circuits containing other annunciators. These induced currents I have satisfied myself result from the action of the original currents upon the soft-iron cores of the annunciators included in circuit. These cores being near one another will exert a magnetic influence upon one another, especially when the cores are fixed upon a common iron base or heel plate.

The object of my invention is to prevent such magnetic induction or other induction between the annunciators when placed near one another, so as to avoid cross-talk or, in short, any harmful induction between the adjacent circuits.

My invention consists in inclosing each coil in a soft-iron shell, with which shell is magnetically connected an armature which extends centrally through the coil and serves to operate the visual or other signal device. The central soft-iron piece forming the armature is pivoted at one end, the other end projecting through an opening in the front end of the shell, this opening being of such shape that the free end of the armature when at rest will be nearest to a particular side of the said opening—that is to say, nearest the side in the direction which it is desired to have the armature move when current is sent through the coil. The projecting end of the armature may be in the form of a hook arranged to release a shutter when the electromagnet is excited. I preferably provide an adjustable weight in the rear end of the armature so arranged that its action may be

made more or less sensitive, according to the conditions required. It is evident that a spring might be used in place of the weight with like results. This central armature I preferably make in the form of a tube, in order that it may be made as light as possible, while at the same time the magnetic lag is diminished.

The construction of my annunciator is such that the shell and the armature will be magnetized when current is passed through the coil. The front end of the shell and the end of the armature projecting through the opening in said end will therefore be of different polarities, after the manner of a horseshoe-magnet, and will exert a mutual attraction for one another.

My invention is illustrated in the accompanying drawings, in which—

Figure 1 is a vertical longitudinal central sectional view illustrative of an electric annunciator embodying my invention. Fig. 2 is a front view of the end of the shell and the armature upon line *xx* of Fig. 1. Fig. 3 is a view of the heel of the annunciator, as seen from section-line *yy* of Fig. 1. Fig. 4 is a transverse vertical section thereof upon line *zz*.

Like parts are indicated by similar letters of reference throughout the different figures.

The drop *a* or any other suitable indicating device adjusted in such manner as to be operated when the armature *b* is attracted may be used. This drop is shown pivoted to a lug provided upon the plate *c*. This plate heretofore has been usually of iron, the drop being of brass. I prefer, however, that the plate *c* should be non-magnetic, and therefore prefer brass, zinc, or like non-magnetic material. The coil *d* is wound in the usual manner on a tube of wood or paper. The shell *e* is of soft iron, and for convenience of manufacture in the assembling of the parts the end *f* is made removable and provided with a central opening. The armature *b* is pivoted, preferably, at this central opening, as shown.

Referring to Fig. 2, it will be seen that the armature *b* when in its normal quiescent condition is nearest the upper edge *g* of the opening. It is evident, therefore, that when the shell and armature become magnetized

the attraction upon the armature will be greatest in the direction *g*. Thus the direction of the movement of the armature may be controlled by the shape of the opening in the front end of the shell. The rear end of the armature may be extended and provided with an adjustable counterpoise *h*.

The operation of my annunciator will be readily understood from the foregoing description. Current sent through the coils magnetizes the shell and armature, and the armature being attracted in the direction *g* its hook is lifted and the shutter falls by gravity in a manner well understood.

My invention admits of various modifications which would readily suggest themselves to those having any familiarity with the science of electricity, and I therefore do not limit myself to the details of construction shown.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, with the shell of soft iron, of the coil placed therein, and a pivoted armature magnetically connected with the shell and extending through the coil, whereby on sending current through the coil the free end of the armature is moved to operate a signal device, substantially as and for the purpose specified.

2. The combination, with the shell, including the coil, of an armature inserted through said coil through an opening in the front por-

tion of the shell, said armature in its normal quiescent condition resting nearest one side of said opening, whereby the direction of the movement of said armature is controlled, substantially as and for the purpose specified.

3. The shell placed over the coil, the rear of said shell being removable and provided with a central opening, and a soft-iron armature inserted through said opening and pivoted therein, said armature extending through an opening in the front end of the shell, substantially as and for the purpose specified.

4. The adjustably-counterpoised armature extending through an opening in a soft-iron shell, said piece of soft iron being influenced by current sent through a coil in proximity thereto, whereby the armature is moved, substantially as and for the purpose specified.

5. The combination, with the shell of soft iron, of the coil placed therein and a pivoted tubular armature magnetically connected with the shell and extending through the coil, whereby on sending current through the coil the free end of the armature is moved to operate a signal device, substantially as and for the purpose specified.

In witness whereof I hereunto subscribe my name this 11th day of January, A. D. 1889.

JAMES D. BISHOP.

Witnesses:

GEORGE P. BARTON,  
ELLA EDLER.