(No Model.)

E. P. WARNER.

Electrical Annunciator.

No. 232,093. **Patented Sept. 7, 1880.**

Fig. 1.

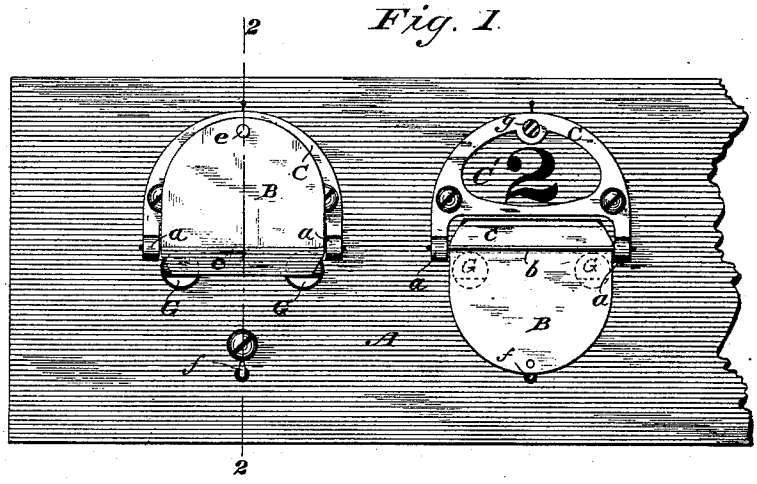


Fig 2.

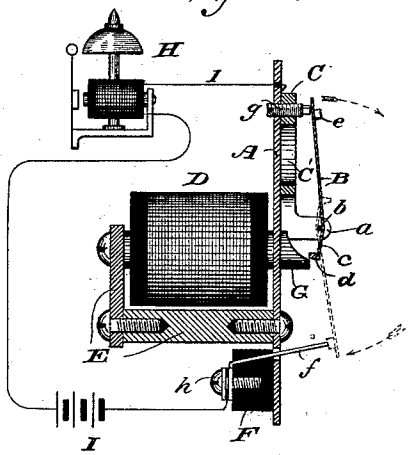
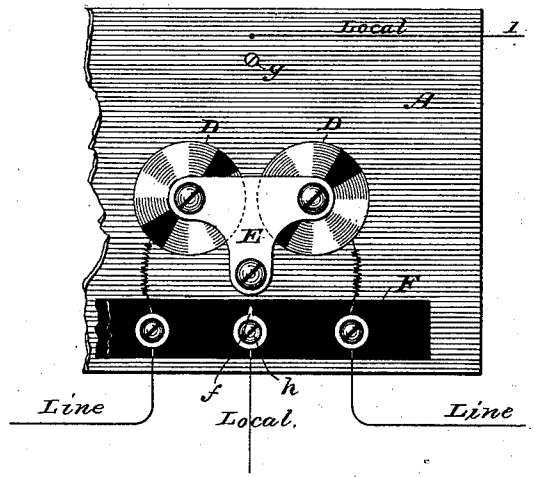


Fig. 3.



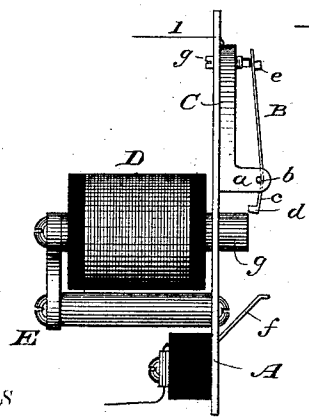


Fig. 4.

WITNESSES

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ERNEST P. WARNER, OF CHICAGO, ILLINOIS.

ELECTRICAL ANNUNCIATOR.

SPECIFICATION forming part of Letters Patent No. 232,093, dated September 7, 1880.

Application filed April 14, 1880. (No model.)

To all whom it may concern:

Be it known that I, ERNEST P. WARNER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Electrical Annunciators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

This invention relates to that class of electrical annunciators in which an electro-magnet is used to remove an obscuring shield or shutter from in front of a numeral or other device, and especially adapted for use in the central office of a telephone-exchange. Its object is to simplify the construction of this class of apparatus by dispensing with the usual springs and catches, and to provide an electrical annunciator which can be operated by weak currents of electricity.

I accomplish these results by constructing my apparatus of an electro-magnet having poles projecting somewhat farther than is customary, the upper faces of which are each cut away to form a curved recess or rabbet, and these poles project through a supporting-base, and have pivoted in front of them a shutter, to one end of which is fixed an armature extending transversely across the inner face of the said shutter, and so arranged that in its normal position it will rest opposite to the outer edge of the curved rabbet of the poles of the electro-magnet. The shutter is pivoted to a metallic frame, which is provided with a suitable aperture for holding the appropriate numeral. In its normal position the shutter covers the numeral; but when a current of electricity passes over the coils of the electro-magnet the armature fixed to the shutter is attracted, and the shutter is tilted and falls forward, thereby exposing the numeral.

In the drawings accompanying this specification, Figure 1 is a front view of the apparatus embracing my invention. Fig. 2 is a vertical section of the same on the line 2 2. Fig. 3 is a rear view. Fig. 4 is a modification.

The letter A designates a supporting-base, of any suitable metal, although wood can be used, if desired. Fastened to said base is a metallic frame, C, provided with the aperture C′, arranged to contain the indicating numeral or other device. The frame C has two extensions, *a*, projecting therefrom, which are provided with suitable apertures for receiving the ends of pivot *b*, fixed to the shutter B. Below the pivot-bar the shutter is bent inwardly, as shown at *c*, Fig. 2, the lower edge of the shutter having fixed to it a bar of soft iron, *d*. Near the top and on the face of the shutter B, and in metallic contact therewith, is a contact-point, *e*. Fixed to a suitable support, E, is an electro-magnet, D, having poles G G projecting through suitable apertures in the base A. The upper part of the face of each of said poles is cut away to form a curved rabbet or recess.

The terminals of the electro-magnet D are connected to main-line battery-posts attached to an insulating-block, F. One terminal of the electro-magnet of a suitably-supported call-bell, H, is in metallic connection with the shutter B by means of metal frame C, base A, and wire 1. The other terminal, 3, includes in its circuit a local battery, I, and is connected to a binding-screw, *h*, fastened to the insulating-block F. Connected to the binding-post *h* is a wire, *f*, which projects some distance through a suitable aperture in the base A, and insulated therefrom and forming a contact-stop to the shutter B. In the upper part of the frame C is a screw-stop, *g*, which limits the backward motion of the shutter B.

The operation of this apparatus is as follows: The terminals of the electro-magnet having been properly connected to a circuit-wire—say of a telephone-exchange, operated by what is known as the "open circuit" system—the shutter B is thrown up by hand and brought to rest against the stop *g*, thus covering the indicating numeral. A person at a station on the circuit by depressing the calling-key will send into the line a current of electricity from the station-battery, which, traversing the coils of the electro-magnet, causes the poles thereof to attract the armature attached to the shutter, which is drawn inwardly until the shutter has swung outwardly beyond its center of gravity, when the upper and heavier portion

of the shutter falls forward and downward in the direction of the arrow until the stop *e* rests against the end of wire *f*, as shown in Fig 2, thereby closing the local circuit through the call-bell, and causing it to ring an alarm. The falling of the shutter uncovers the numeral, and when the call has been answered the operator lifts the shutter into its normal position.

The shutter may be made of various materials—as, for instance, it may be formed entirely of thin sheet iron or steel, and have its lower edge folded or bent into tubular shape to form an armature; or it may be made of wood or hard rubber, and have the armature and suitable plates for completing the bell-circuit attached.

While I prefer to use in the construction of my apparatus electro-magnets having their poles recessed, I may obtain satisfactory results by using electro-magnets with plain poles, as illustrated by Fig. 4.

What I claim is—

The combination, with the pivoted shutter B, provided at its edge with the armature *d*, of the electro-magnet D, having its poles recessed and arranged to attract the said armature into the recesses thereof, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

ERNEST P. WARNER.

Witnesses:

CHARLES SILET,

CHESTER D. CRANDALL.