No. 655,763. Patented Aug. 14, 1900.

W. M. DAVIS.

ANNUNCIATOR.

(Application filed Dec. 15, 1899.)

(No Model.)

Fig. 1.

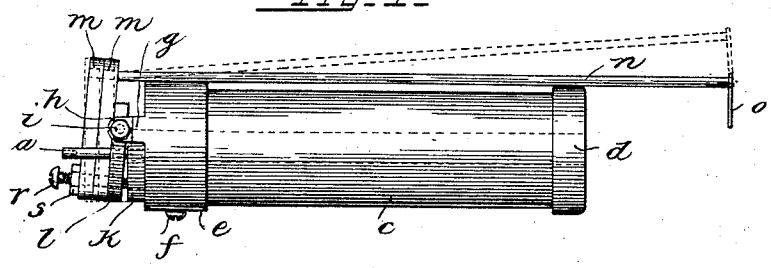


Fig. 2.

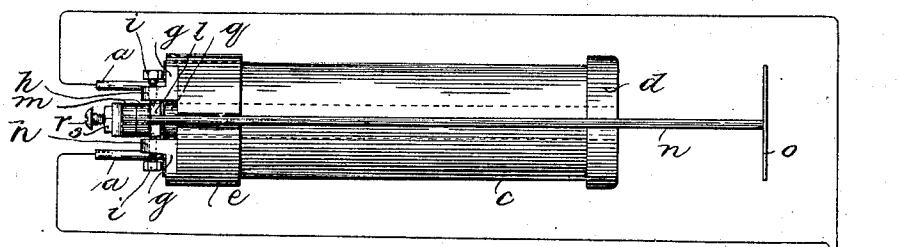


Fig. 3.

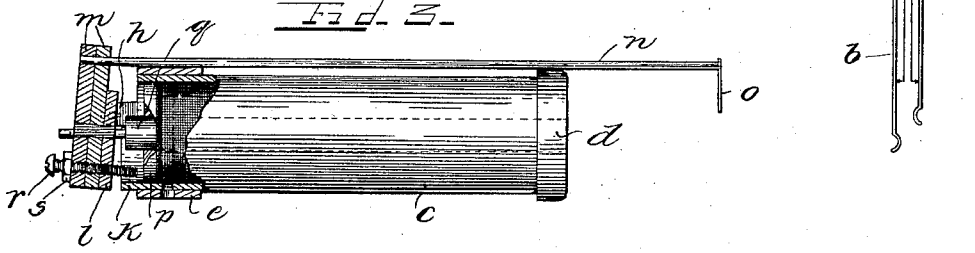


Fig. 4.

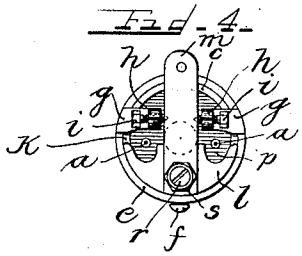
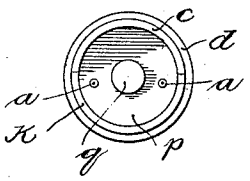


Fig. 5.



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UNITED STATES PATENT OFFICE.

WILLIAM M. DAVIS, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE STROMBERG CARLSON TELEPHONE MANUFACTURING COMPANY.

ANNUNCIATOR.

SPECIFICATION forming part of Letters Patent No. 655,763, dated August 14, 1900.

Application filed December 15, 1899. Serial No. 740,414. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM M. DAVIS, 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 Annunciators, (Case No. 2,) 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.

My invention relates to annunciators, and has for one object the provision of an improved form of annunciator employing an armature and a target-lever wherein the armature is confined to a very small range of movement, so that the annunciator may be operated with small current, the lines of force essential for effecting the attraction of the armature having to bridge a very small air-gap between the armature and the poles of the electromagnet.

My invention has for a further object the provision of an improved mounting for the pivots of the armature, so that the said pivots may be readily secured in position without having to be separately fastened in place.

Generally speaking, my invention comprises an annunciator provided with an armature pivoted at one end of the electromagnet, comprising a part of the annunciator, the pivotal support for the armature being preferably located slightly above the center or axis of the coil of said electromagnet, so as to enable the armature to actuate the target-lever through a shorter range of motion than was heretofore accomplished. The target-lever preferably carries a target which is bodily movable therewith and upon which an indicating-number may be placed as is desired, as is well known to those skilled in the art.

When the annunciator of my invention is to be employed in connection with telephone-exchange systems, I preferably surround the same by a magnetic sheath of iron to prevent induction of voice-currents from one coil to another. In order that the pivotal supports for the armature may be readily assembled in place, I mount the same upon a collar and slip the collar over the end of the magnetic sheath, a single screw or other fastening means serving to secure the collar in place. It is obvious, however, that this same supporting-collar could be slipped directly over the magnet-coil if the coil should be unprovided with a sheath. By these means each pivotal support does not require a separate fastening. The collar supporting the same also serves to maintain the said pivots in their proper relative positions.

I will explain my invention more fully by reference to the accompanying drawings, in which—

Figure 1 is a side elevation of my improved annunciator, an alternative position of the target-lever being indicated by dotted lines. Fig. 2 is a plan view of the annunciator illustrated in Fig. 1, circuit connections of the annunciator with a telephone-line being illustrated. Fig. 3 is a side elevation, partially in section, of the annunciator. Fig. 4 is an end view of the annunciator, showing my improved armature-mounting. Fig. 5 is an end view with the armature and its pivots removed.

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

The annunciator shown is provided in this instance with a single electromagnet whose terminals are led through tubes *a a* to permit the annunciator to be connected with a suitable circuit—such as is illustrated, for example, in Fig. 2, where the terminals of the annunciator-coil are connected with the back contacts of a spring-jack switch *b*, connected with the telephone-line to enable a subscriber to include the annunciator in circuit with a suitable source of current.

The annunciator-coil is provided with a magnetic sheath *c*, having a cap *d* at one end. A collar *e* incloses the sheath at the other end, being secured thereto preferably by a screw *f*. (Removed for the sake of clearness from Fig. 3.) I use the term "inclosing" in the claims in the sense of a collar that either completely or partially surrounds the armature-coil, as it is obvious that the same result can be secured by either construction. This collar is provided with two rearwardly and inwardly extending ears *g g*, which are located slightly above the diameter of the coil. Each ear is provided with an inner rearward extension *h*, as shown most clearly in Figs. 1, 2

and 4. The extensions *h* are provided with threaded holes extending transversely of the annunciator for receiving the pivot-screws *i*, the pivot-screws being opposed and located slightly above the diameter of the sleeve *e*. The extensions *h* are preferably slotted, as indicated. The lower half portion of the sheath or sleeve *c* projects slightly to the rear and forms a segmental pole-piece *k*. The armature *l* is similar in outer contour to the pole-piece *k* and is provided with curved recesses for accommodating the tubes *a a*. The armature proper is preferably pivoted directly upon the screws *i i*, as shown most clearly in Figs. 2 and 4, this portion of the armature being reduced in width, the portion of the armature below the diameter of the coil being practically semicircular.

I believe it is new with me to make a pole of the electromagnet in the form of a segmental sleeve-section.

Strips of metal *m*, preferably iron, are secured to the armature to act as a counterbalance and to serve as a means of securing one end of the target-lever *n* to the armature, the other end of the target-lever carrying a target *o*. A collar *p* of insulating material surrounds the core *q* of the electromagnet, the core projecting beyond the collar and forming a second pole-piece. An adjusting-screw *r* passes through the armature and the counterbalancing-plate secured thereto and is adapted for direct engagement with the insulating-collar *p*. A set-nut *s* is employed to secure the screw in any position to which it may be adjusted. When circuit is closed through the annunciator, the magnetic circuit is completed by way of the core *q*, the armature, and the projecting portion *k* of the sleeve.

By the construction shown it is obvious that the lines of force threading the air-gap between the armature and the opposed magnetic portions do not have to be greatly shortened to effect the desired movement of the armature and target-lever.

I have herein shown and particularly described one embodiment of my invention; but it is obvious that other features of construction could be devised without departing from the spirit of the invention, and I do not therefore wish to be limited to the precise construction shown; but,

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

1. In an annunciator, the combination with an electromagnet, of a segmental pole-piece *k* in the form of a sleeve-section, a core *q* for the electromagnet projecting beyond the same and partially surrounded by the sleeve-section *k*, a pivoted armature arranged in juxtaposition with the said core and portion *k*, and a target-lever secured to the armature, substantially as described.

2. In an electromagnet, the combination with a coil, of a segmental sleeve-section *k* for conveying lines of force set up by the said coil, inwardly-projecting pivot-bearings located above said sleeve-section, and located between the periphery and axis of the annunciator, and an armature opposed to the said sleeve-section, substantially as described.

3. In an annunciator, the combination with an electromagnet, of a sleeve *e* inclosing the same provided with pivot-supporting extensions *h*, screws *i*, *i*, carried by the said extensions, an armature supported by the pivots, and a target-lever secured to the armature, substantially as described.

4. In an annunciator, the combination with an electromagnet, of a sleeve *e* inclosing the same, the said sleeve being provided with inwardly-projecting ears *g*, *g*, the said ears being provided with rearwardly-projecting extensions *h*, *h*, pivots *i*, *i* carried by the projections *h*, *h*, an armature held between the said pivots, and a target-lever secured to the armature, substantially as described.

5. In an annunciator, the combination with an electromagnet, of a sleeve *e* inclosing the same, the said sleeve being provided with inwardly-projecting ears *g*, *g*, the said ears being provided with rearwardly-projecting extensions *h*, *h*, pivots *i*, *i* carried by the projections *h*, *h*, an armature held between the said pivots, a target-lever secured to the said armature, and a segmental sleeve-section *k* of magnetic material for receiving lines of force set up by the electromagnet opposed to the lower end of the armature, the said lower end of the armature being shaped substantially to conform in contour to the said sleeve-section, substantially as described.

In witness whereof I hereunto subscribe my name this 11th day of December, A. D. 1899.

WILLIAM M. DAVIS.

Witnesses:
GEORGE L. CRAGG,
CHARLES E. HUBERT.