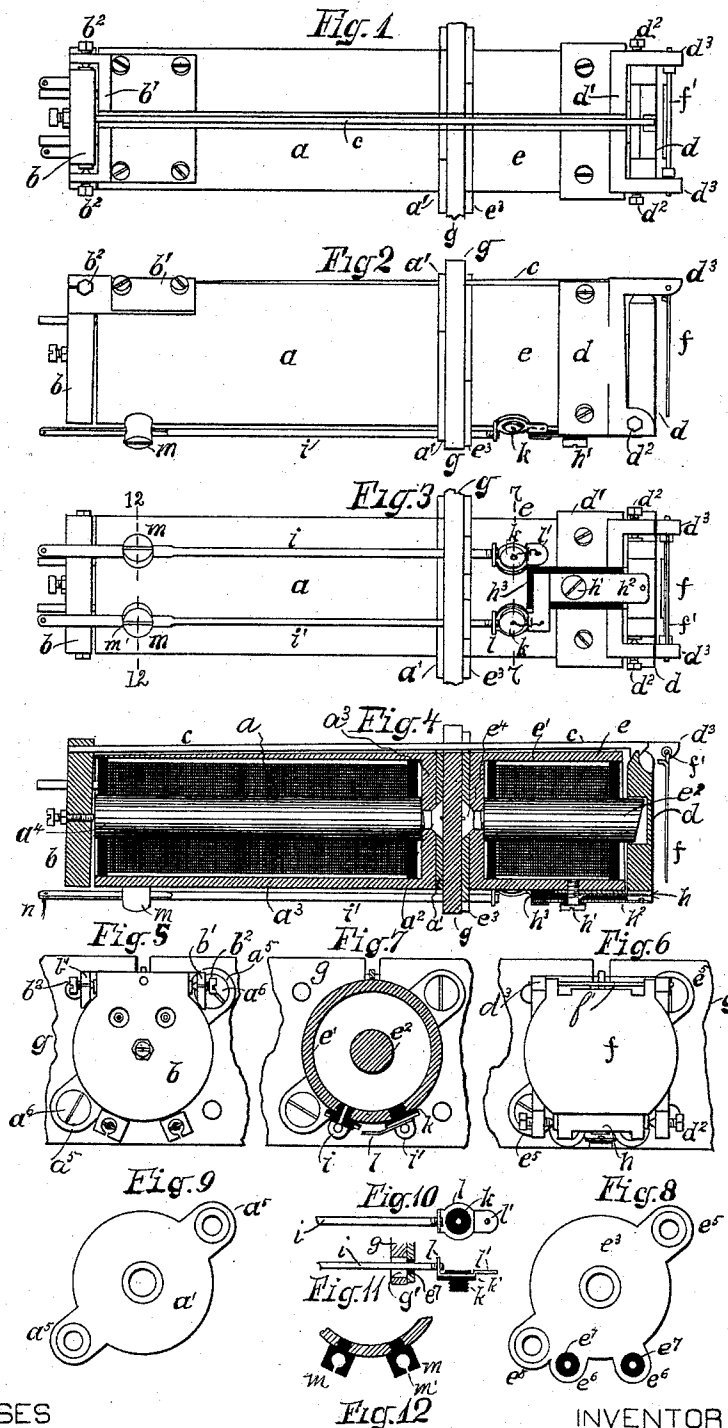


(No Model.)

F. R. McBERTY.
TELEPHONE SWITCHBOARD ANNUNCIATOR.

No. 498,808.

Patented June 6, 1893.



WITNESSES
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TELEPHONE-SWITCHBOARD ANNUNCIATOR.

SPECIFICATION forming part of Letters Patent No. 498,808, dated June 6, 1893.

Application filed October 29, 1892. Serial No. 450,374. (No model.)

To all whom it may concern:

Be it known that I, FRANK R. McBERTY, a citizen of the United States, residing at Downer's Grove, in the county of Du Page and State of Illinois, have invented a certain new and useful Improvement in Telephone-Switchboard Apparatus, (Case No. 3,) 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 for switchboards of telephone exchanges, more particularly to that class of annunciators which are arranged to be automatically restored by the operation of establishing connection with the line circuit.

The object of my invention is to provide an annunciator of the class mentioned so constructed as to be readily removable from its place in the switchboard for purposes of adjustment or repair.

In switchboards of telephone exchanges an individual annunciator is usually provided for each line of the exchange, the different annunciators being divided into groups of suitable number, one group being placed under the care of a single attending operator at a switchboard. Each group of annunciators is placed in a certain space provided for it in the face of the switchboard. The members of the group are mounted upon strips of metal of suitable length, each strip ordinarily carrying fifteen or more annunciators. These separate strips are arranged horizontally, one above another in a panel, and in order to economize the valuable space on the face of the switchboard the annunciators are made as small as practicable and are placed quite closely together. It will thus be seen that a panel of annunciators comprises a large number arranged very closely together, the front of the annunciators projecting outwardly toward the operator and the rear projecting toward the rear of the switchboard.

The self-restoring or automatically restoring annunciator ordinarily in use consists of two separate electro-magnets mounted upon opposite sides of a common supporting plate, whereby the front coil or restoring coil of the annunciator appears upon the front of the

switchboard and the rear coil is accessible only from the rear of the switchboard.

It not infrequently occurs that repairs or adjustments of a particular annunciator become necessary, in order to effect which it is desirable to remove the particular annunciator without disturbing the remainder of the strip or of the panel; or the front or rear portion of a single annunciator may become disarranged and may require removal independently of the remainder of the annunciator.

It is the object of my invention to so construct these self-restoring annunciators that the front or rear portion of any annunciator may be removed from the panel or strip from the front or rear of the switchboard, as the case may be, without disturbing the remainder of the drops in the panel or the remaining portions of the particular annunciator, the work at the same time being accomplished with rapidity and facility to avoid interruption of the service.

My invention consists in certain details of construction and arrangement which will be hereinafter described and will be indicated particularly in the claims.

My invention is illustrated in the accompanying drawings.

Figure 1 is a plan of my improved self-restoring annunciator. Fig. 2 is a side elevation thereof. Fig. 3 is a view of the same from below. Fig. 4 is a longitudinal central sectional view taken vertically. Fig. 5 is a rear elevation of the annunciator. Fig. 6 is a front elevation of the same. Fig. 7 is a transverse section on the line 7-7 of Fig. 3. Fig. 8 is a view of the supporting plate of the front or restoring electro-magnet of the annunciator. Fig. 9 is a view of the equivalent supporting plate of the rear electro-magnet. Fig. 10 shows a plan of one of the rheophores or circuit connections. Fig. 11 is a side elevation thereof. Fig. 12 is a sectional view of the portion of the shell of the rear electro-magnet on the line 12-12 of Fig. 3.

I will indicate parts of the various figures by letters of reference, like parts being designated by similar letters.

The annunciator comprises essentially a tubular electro-magnet *a* provided with a pivoted armature *b* carrying an arm *c* which nor-

mally engages with and retains a heavy pivoted shutter *d* of magnetic material adapted to fall outwardly to a slight distance when disengaged from the said arm, and an electro-magnet *e* adapted to act upon the shutter *d* and to bring it again into engagement with the arm *c* when energized. A light shield or apron *f* is pivoted at its upper edge and is suspended in front of the shutter *d* so that the latter will strike it and bring it into a horizontal position when released by the catch-arm.

The tubular magnet *a* is mounted upon a thin plate *a'*, shown in elevation in Fig. 9, being secured thereto by a screw *a²*, passing through the shell *a³* of the electro-magnet *a* and into the core *a⁴* thereof. The plate *a'* is provided with lugs *a⁵* by means of which it is secured by screws *a⁶* to the supporting plate or strip *g* which is common to a considerable number of annunciators. The shell *a³* carries at its rear portion a small bracket *b'* supporting trunnions *b²* upon which the armature *b* is journaled.

The restoring magnet *e* is another tubular magnet having a shell *e'* and a core *e²*, and is secured to a plate *e³*, shown in Fig. 8, by a screw *e⁴* passing through the shell and into the core *e²* of the magnet. The plate *e³* is provided with lugs *e⁵* whereby it also may be secured to the common supporting plate *g* of the strip. The plate carries also two small lugs *e⁶* having perforated bushings *e⁷* secured therein. The shell *e'* likewise carries a bracket *d'* upon the under side of which are provided trunnions *d²* upon which the heavy shutter *d* is journaled. At its upper portions it is furnished with projections *d³*; upon a wire *f'* through these projections the shield *f* is hung. A light spring *h* is secured by a screw *h'* upon the under side of the shell of the magnet *e*, said spring projecting forward beneath the shutter *d* in such relation thereto that when the shutter *d* falls outwardly it presses the free extremity of the spring *h* downward. A rigid plate *h²* is provided also secured by screw *h'*, parallel with the spring *h* and having a contact piece opposite the extremity thereof, so that when the spring *h* is depressed, as described, it is brought into contact with the contact anvil upon the spring *h²* thereby electrically connecting the two. Normally the springs are insulated from each other by a plate *h³* of insulating material and by suitable bushings around the screw *h'* at the point at which it passes through the rigid plate *h²*.

The rods *i i'* provide means for establishing connection with the coil of magnet *e* from the rear of the switchboard. The terminals of the coil of magnet *e* are led through perforations in the bushings *k* screwed into the shell *e'* of magnet *e*. The form of bushing *k* is best shown in Figs. 10 and 11. It is constructed with a threaded portion adapted to screw into the perforation of the shell *e'* of the magnet, above which is a flange *k'*, the bushing at the

other side of the flange being cylindrical and projecting to a slight distance beyond the face of the flange. A metal piece is formed as shown in Figs. 10 and 11. It is provided with a central perforation adapted to fit over the portion of the bushing in front of the flange and is furnished with two projecting lugs, to one of which, *l'*, the terminal of the coil is soldered, and to the other of which *l*, the extremity of the rod *i* is secured by soldering. The rods *i* extend rearward from the plates *l* through the perforated bushings *e⁷* in plate *e³*, openings *g'* being provided in the supporting plate *g* to admit of their free passage, as shown in partial section in Fig. 11. In assembling this portion of my invention, the bushings *k* are first screwed into the shell *e'* of the magnet *e*, the magnet *e* being already mounted upon the plate *e³*. The plates *l* are then placed in proper position over the bushings *k*, and finally the rods *i* are inserted through the perforations in the bushings *e⁷* in plate *e³* and are soldered to the plates at *l'*. It will be noticed that by this device the rods *i* are now prevented both from longitudinal and rotary movement, whereby the breaking of the connections therewith by twisting of the wires at the rear of the switchboard is avoided. The rods *i* then pass to the rear of the drop, being supported at their rear extremities by studs *m* of peculiar construction, best shown in Fig. 12. The stud *m* is of insulating material and is a cylinder having one extremity threaded to screw into the shell *a³* of magnet *a*. A transverse perforation is provided in the stud and a narrow slot *m'* is cut from the perforation to the outer extremity of the stud, as shown in Fig. 12. The rod *i* passes through this perforation in the stud *m* and is supported in position thereby. The rod is flattened for a portion of its length, or thickened to prevent its slipping out through the slot *m'* described. The object of this feature may be described as follows: The connecting wires to the magnet *e* are soldered to the rear extremities of the rods *i*. If now it is desired to remove the rear portion of the annunciator without disturbing the forward portion the wires leading to the rods *i* are bent down at right angles to the flat face of the rod, as shown at *n* of Fig. 4, when the magnet *a* may be released at its forward end and slipped off rearwardly, the wires *n* soldered on the rods *i* passing through the slots in the stud *m* as the magnet is withdrawn. Thus the rear portion of the annunciator may be removed without disturbing the connection with the front portions.

In practice, one of the connections to the coil *e* is made through a battery to earth and this same battery serves as a source of current in the night bell circuit which includes the normally open contact points *h* and *h²*. I therefore secure one of the plates *l* directly to the rigid contact *h²* of the night bell springs, as shown in Fig. 3.

It will thus be seen that when the annuncia-

tors are mounted as described upon a common plate *g* and are in position in the switchboard, the rear portion of any single annunciator may be removed by simply removing the two screws *a*⁶ in Fig. 5, and withdrawing the rear portion of the annunciator. Similarly, the front portion of the annunciator may be removed from the switchboard by withdrawing the two screws *e*⁸, seen in Fig. 7.

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

1. In an individual annunciator the combination of an operating coil, a supporting plate
15 secured thereto, a restoring coil and another supporting plate secured thereto, and a common supporting plate, the different annunciator magnets being supported on opposite sides thereof by means of their individual supporting
20 plates, whereby either magnet is removable independently of the other, substantially as described.

2. The combination with a common supporting plate, of electro-magnets removably
25 mounted upon opposite sides thereof, perforated insulating supporting studs having slots extending from the perforations to the outside of the stud, and rigid rods secured to one

of said electro-magnets and forming the terminal connection thereof, said rods projecting through the perforations in the studs in the other magnet, substantially as described. 30

3. The combination with the restoring magnet *e* of the night bell springs mounted thereon, adapted to be closed together by the armature thereof, metallic terminal pieces mounted
35 on said magnet *e*, one of said metallic terminal pieces being connected with one spring of said night bell springs, substantially as described.

4. The combination with a common supporting plate, of two individual supporting
40 plates mounted upon opposite sides thereof and each carrying an electro-magnet rigidly secured to it, each magnet being with an armature at its outward or free extremity, a
45 catch-arm carried by one of said armatures and normally engaging with the other to retain it in position, substantially as described.

In witness whereof I hereunto subscribe my
50 name this 28th day of July, A. D. 1892.

FRANK R. McBERTY.

Witnesses:

ELLA EDLER,
WALTER L. SMITH.