No. 854,780. PATENTED MAY 28, 1907.

H. TIDEMAN.

COMBINED ANNUNCIATOR AND RINGER FOR TELEPHONE LINES.

APPLICATION FILED JAN. 16, 1905.

Fig. 1.

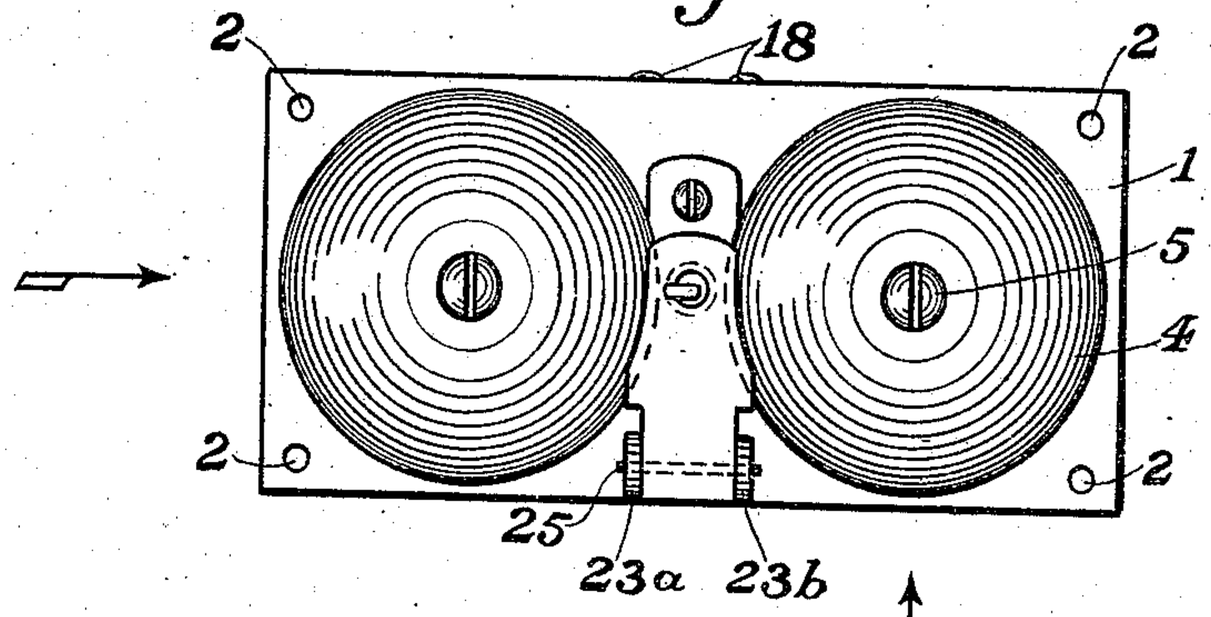


Fig. 2.

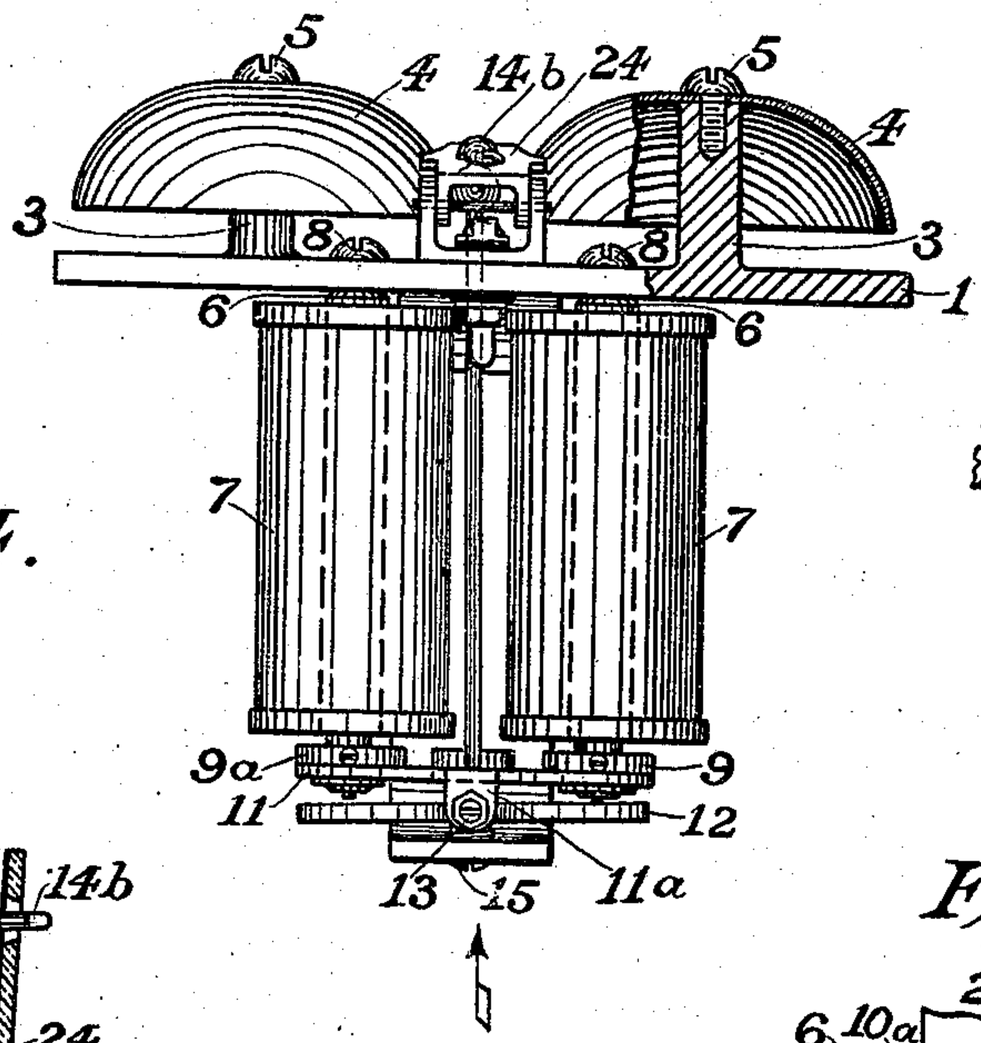


Fig. 3

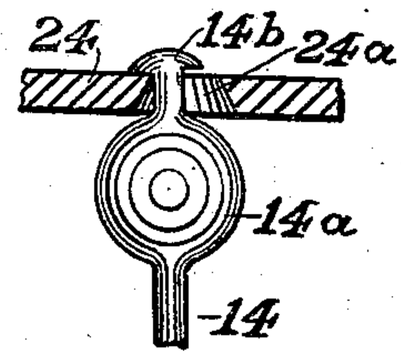


Fig. 4.

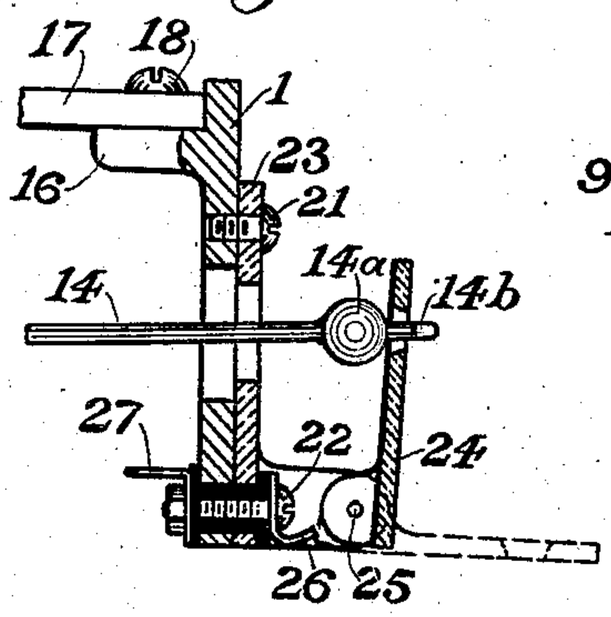


Fig. 5.

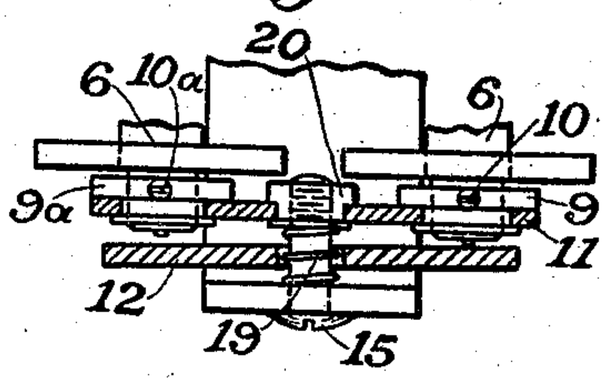
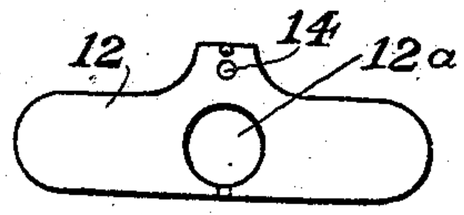


Fig. 6



Witnesses:
Hazael C. Prado.
David S. Hulfish.

Henry Tideman.
Inventor.
by Kempster B. Miller,
Attorney.

UNITED STATES PATENT OFFICE.

HENRY TIDEMAN, OF MENOMINEE, MICHIGAN.

COMBINED ANNUNCIATOR AND RINGER FOR TELEPHONE-LINES.

No. 854,780. Specification of Letters Patent. Patented May 28, 1907.

Application filed January 16, 1905. Serial No. 241,221.

To all whom it may concern:

Be it known that I, HENRY TIDEMAN, a citizen of the United States of America, and a resident of Menominee, county of Menominee, and State of Michigan, have invented a new and useful Improvement in a Combined Annunciator and Ringer for Telephone-Lines, of which the following is a specification.

My invention relates to an improvement in combined annunciators and ringers for telephone lines, whereby a construction that is at once simple, durable, reliable and cheap is secured.

In certain classes of telephone work it becomes desirable to provide signal-receiving mechanism which will not only give an audible but a visual signal as well. In some cases the audible signal may continue as long as the visual signal remains displayed, both continuing after the current in the line has ceased, and until the operator, manually or otherwise, restores the visual signal to its normal position. This class is represented by the ordinary switchboard drop, which in falling closes a local circuit containing the bell or buzzer and battery. In another class of combined visual and audible signals, it is desirable that the audible signal shall persist only as long as the actuating current in the line continues to flow, while the visual signal remains displayed until restored by some act of the operator. This latter condition is desirable in those cases where the presence of an operator is not required at the switchboard at all times. In such cases it is often necessary for the operator, who remains within reach of the sound of the audible signal, to distinguish between signals by sound, in order that she may determine whether or not her presence is needed at the switchboard without actually being in sight of it. This is true on certain toll lines where a call may be for the switchboard, or for some other station on the line, and the operator may thus distinguish by audible code whether or not her attention is required for any particular call. Where several lines are thus terminated, a visual signal associated with each line would tell the operator when she comes to the board in response to a call, over which of the lines the call came in. It is to this latter class of combined visual and audible signals that my invention particularly relates.

In the accompanying drawings which illustrate my invention, Figure 1 is a front elevation of the combined ringer and drop; Fig. 2 a bottom plan view thereof; Fig. 3 a detail view of the striker and latch; Fig. 4 a side elevation partly in section of the mounting plate, the striker and drop; Fig. 5 a detail partly in section showing the mounting of the armature with respect to the pole pieces, and the method of adjusting the same, and Fig. 6 is a view of the armature.

Like characters refer to like parts throughout the several views.

In the drawings, the numeral 1 refers to the mounting plate which carries the entire structure, by means of which and the holes 2 the structure as a whole may be secured in position on the face of the switchboard. This plate 1, preferably of cast iron, carries on its face as integral parts, the gong posts 3, upon which the gongs 4 are mounted, these latter being secured in place by screws 5 in the ordinary manner. Secured to the plate 1, and projecting from the rear thereof, are the cores 6 of the electromagnets 7, forming the actuating means for both the audible and visual signals. These cores 6 are preferably of very soft iron, and are secured in position with respect to the plate 1 by the screws 8 in a manner clearly understood. That part of the plate 1 which lies between the screws 8, and the adjacent portions thereto, thereby form a portion of the magnetic circuit of the ringer, this portion being commonly referred to in electromagnets of this type, as a yoke. A rearwardly projecting lug 16, cast integrally with the plate 1, also serves to carry the permanent magnet 17 used to polarize the armature and cores of the ringer, the magnetic circuit from the cores to this magnet being through the magnetic material of the plate 1. It is for these reasons, and also for considerations of cheapness of material and ease of working that the front plate 1 is made of magnetic material, such as cast iron, and it is seen that the plate 1 is thus made to serve the combined functions of a mounting plate for the entire structure, a support for the gongs, and a magnetic yoke and support for the magnets; a single integral piece serving in all these respects. Mounted on the rear of each of the cores is a ring 9 and 9^a, best shown in Fig. 5. These are secured to the core by set screws 10 and 10^a as clearly indicated. Each of these rings 9 and 9^a, has a projecting shank which extends through the plate 11 of brass or other suitable non-mag-

netic material, the portions of these shanks which extend through the plate 11 being spun out so as to bind the rings 9 and 9[a] to the plate 11, as clearly shown in Fig. 5. By means of the set screws 10 and 10[a], the position of the plate 11 with respect to the cores may be altered to some extent. The ends of the cores project through the plate 11, and the shanks of the ring 9 and 9[a] to a slight extent, and each core carries at its center a small copper or brass rivet, or is otherwise arranged to prevent the armature 12 from sticking to either one of the cores due to residual magnetism.

The armature 12 is pivoted between two screws, 13, of which only one is shown in the drawing. These screws are carried in ears 11[a], bent up from the plate 11, which in turn is carried upon the cores as already described. The armature 12 is shown in Fig. 6, and is of soft iron in order that it may be properly influenced by the magnetism developed in the cores. This armature carries a rod 14 which in turn carries a ball or striker 14[a], and a latch 14[b]. Through the center portion of this armature is bored a hole 12[a], through which an adjustment screw 15 is adapted to pass for the purpose to be described.

The plate 1 is provided with a lateral, projecting lug 16, to which the L-shaped permanent magnet 17 is secured by means of the screw or screws 18. The end of the magnet 17 is bent into proximity to the armature 12, and through a hole in this magnet the screw 15 already mentioned is adapted to pass freely. This screw, which also passes through the hole 12[a] in the armature 12, is surrounded by a spiral spring, 19. The end of the screw 15 engages a threaded nut 20 mounted firmly in the plate 11 about midway between its ends. By means of this screw 15, the adjustment of the armature 12 toward or from the poles of the magnet is effected. When the screw 15 is turned in a right-handed direction, the central portion of the plate 11, which carries the armature trunnions, is drawn downwardly as shown in the drawing, the plate 11 being moved in that direction against the strength of the spring, 19, which is held under compression. By this means the armature is given a coarser adjustment than before, its ends now being farther from the poles of the magnet. If the screw 15 is turned in the opposite direction, the plate 11 tends to assume its forward position, being assisted by the strength of the spring 19, and thus a closer adjustment of the armature is effected, securing a shorter stroke for the striker. The movements of the plate 11, brought about by the action of the screw 15 and the spring 19, are made possible by the loosening of the screws 10 and 10[a], the rings 9 and 9[a] then sliding in the cores. After adjustment, the set screws 10 and 10[a] are tightened up, thus binding the whole firmly together. If only a slight adjustment is necessary, then the screws 10 and 10[a] need not in some cases be loosened, as the same relative movement between the armature and the cores may be brought about, due to the elasticity of the plate 11, it being bent in either direction slightly, by the action of the screw 15, or of the spring 19.

Mounted on the front of the plate 1, by the screws 21 and 22, is the piece 23, preferably of metal having two forwardly projecting ears, 23[a] and 23[b], in which the shutter or drop 24 is pivoted by the pin 25. This drop is adapted to be held by the latch 14[b], on the armature rod, 14, in a nearly vertical position to fall outwardly when released by such latch to substantially a horizontal position, as indicated in dotted lines in Fig. 4. Through the upper portion of the shutter 24 is bored a conical hole, 24[a], this hole being smaller in front than in the rear. Through this hole projects the latch 14[b], carried on the front end of the striker rod 14, this latch having two projecting surfaces so formed as to engage the shutter and retain it regardless of which side the rod 14 is at the time being held by the magnetizing force exerted on the armature. When, however, the armature is set in vibration, the latch 14[b] disengages the shutter allowing it to fall outward when it assumes the position shown by dotted lines in Fig. 4. At the same time the ball 14[a], which is arranged to play between the gongs, strikes against the gongs, causing them to sound.

I have found that better results may be secured by making the inner surfaces of the latch 14[b] unsymmetrical, as is most clearly shown in Fig. 3. To be more specific, I so form the two opposite holding surfaces of this latch that when the rod 14 is in one position, say at the left, the shutter 24 is held in a position more nearly vertical than if the rod 14 is in its right-hand position. By thus making the two holding surfaces of the latch 14[b], occupy different planes, one of which is slightly farther from the pivot of the armature than the other, I find that the sensitiveness of the drop mechanism is greatly enhanced.

In Fig. 3, the engagement is shown between the shutter 24 and the holding surface of the latch 14[b] which is nearer the ball 14[a]; with the first movement of the arm 14, the shutter 24 will be permitted to move a small distance to permit engagement between the face of the shutter 24 and the more advanced holding surface of the latch 14[b], and then upon the return of the arm 14, the comparatively sharp edge of the latch 14[b] will engage the inner surface of the conical hole 24[a] and tend to displace the shutter 24 from its vertical position, thus assisting the positive action of the shutter 24 in response to the movement of the arm 14.

The screw 22 which secures the lower part of the trunnion pieces 23, against the mounting plate 1, is insulated from both the piece 23 and the plate 1 by means of rubber bushings and washers in a well understood manner. Under the head of the screw is carried a metal clip, 26, against which the heel of the shutter 24 is adapted to make contact when the shutter is down. By this means an electrical circuit between the plate 1 and the screw 22 is completed, one terminal of this circuit being the plate 1 itself, or the frame of the switchboard to which it is attached, and the other terminal being the clip 27 held under the nut of the screw 22. If, therefore, an alarm bell and a battery or other source of current be connected at a circuit between the clip 27 and the frame of the switchboard, an alarm will be sounded however the drop falls, as in the case of the night alarm of an ordinary switchboard. By this means it is possible to secure an additional audible signal which will be sounded as long as the drop remains in its fallen position.

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

1. In a combined magneto bell and drop, a mounting plate, a drop pivoted in front of said mounting plate, and having a conical hole near the edge farthest from its pivot, a pair of gongs mounted on the front of said plate, a striker adapted to play between said gongs, a catch carried on said striker adapted to engage said shutter and said conical hole, and a pair of electro magnets for moving said striker and catch, substantially as described.

2. In an electromagnetic signal, the combination of a drop shutter having a conical hole near the edge thereof, a latch adapted to hold said shutter by latch teeth passing through said conical hole and engaging the edges thereof, said latch teeth being located in different planes parallel to the face of said shutter, and means for vibrating said latch, substantially as described.

3. In a combined ringer and drop, a mounting plate, gong-supporting studs integral with said mounting plate, gongs supported upon said studs, a vibrating tapper arranged to vibrate between said gongs, a shutter having a conical hole and supported upon said mounting plate, and a latch integral with said tapper and projecting through the hole of said shutter and engaging the edges thereof, substantially as described.

Signed by me at Menominee, county of Menominee and State of Michigan, in the presence of two witnesses.

HENRY TIDEMAN.

Witnesses:
L. JACKMAN,
A. J. NAUGLE.