May 10, 1927. 1,628,367

A. F. LAKE

BELL

Filed Jan. 2, 1926

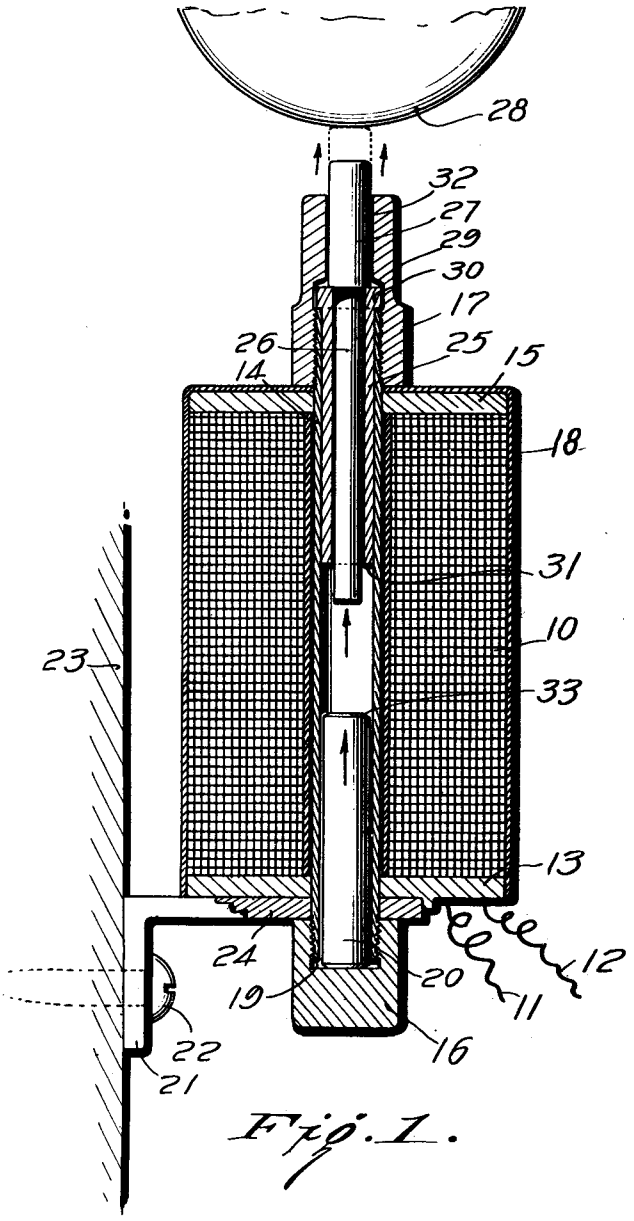


Fig. 1.

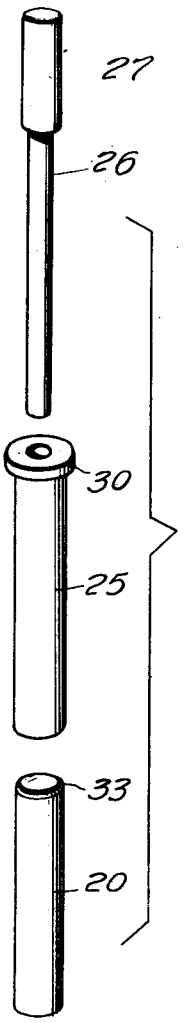


Fig. 2.

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UNITED STATES PATENT OFFICE.

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BELL.

Application filed January 2, 1926. Serial No. 78,900.

My invention relates to audible signaling apparatus and in particular to bell constructions.

The primary object of the invention is the provision of a novel construction of single stroke alternating current bell. Another object of the invention is the provision of an improved solenoid bell striker wherein simplicity of construction is combined with maximum efficiency of operation. A further object of the invention is the provision of a single stroke bell for use on an alternating current wherein the use of springs is eliminated, and chattering prevented.

With these and such other objects in view as will be apparent from the description, the invention resides in the novel combination, construction, and arrangement of parts hereinafter described and claimed and illustrated in the accompanying drawings wherein:

Figure 1 is a longitudinal vertical section through a bell assembly constructed in accordance with the principles of the invention, with the gong and parts of the striker mechanism being shown in elevation;

Figure 2 is a group elevation of the elements comprising the striker and striker mounting.

In detail the invention comprises a winding 10 comprising a solenoid spool, the leads 11 and 12 of which extend through one of the spool heads 13 and are adapted for connection in an alternating current circuit. The core of the solenoid is formed with a hollow brass tube, as a sleeve 14 which extends beyond the spool head 13 at one end of the solenoid and beyond the spool head 15 at the opposite end thereof, the extremities of the tube being externally threaded for receiving thereover cap nuts 16 and 17 respectively disposed upon opposite ends. Disposed over the solenoid spool is a cover or casing 18 which protects the solenoid winding.

The cap nut 16 is provided with a central cylindrical recess 19 adapted to receive the threaded extension of the brass tube 14 and also to form a seat for the lower end of a steel cylinder 20 loosely slidable longitudinally within the tube 14.

A bracket 21 is adapted to be secured by suitable fastening means such as the screw 22 to the face of a vertical wall or support 23, the bracket having a horizontally extending arm 24 apertured to engage over the lower end of the tube 14 and to be clamped between the lower spool head 13 and the cap nut 16 whereby the solenoid is rigidly supported on the horizontal arm of the bracket in a vertical position.

Seated within the upper end of the brass tube 14 is a hollow steel tube 25 in the form of a bushing through which is slidably received the stem 26 of a bronze striker provided at its upper end with an enlarged striker head 27 adapted for contact against a gong 28 disposed in any suitable manner adjacent the solenoid. The cap nut 17 is formed with an internally annular shoulder 29 between which, and the upper end of the tube 14, is retained an annular head 30 formed integral with the bushing 25 whereby upon screwing down the cap nut the bushing is anchored in position. The lower end 31 of the steel bushing 25 terminates short of the center of the solenoid while the stem 26 of the striker extends an appreciable distance below the end of the bushing. The head of the cap nut 17 is provided with a longitudinal bore 32 extending therethrough which receives the striker head 27 forming a guide therefor, the lower end of the striker head being seated on the top of the bushing 25 in the retracted position of the striker.

The steel cylinder 20 which is normally seated on the bottom of the recess 19 in the lower cap nut 16 is slightly tapered at its upper end 33, which terminates short of the center of the solenoid whereby the cylinder 20 and lower end of the striker stem 26 are normally disposed in spaced relation within the core of the solenoid.

In the operation of the bell when an alternating current is passed through the solenoid winding the stationary steel bushing 25 and steel cylinder 20 are magnetically energized for mutual attraction, causing the cylinder 20 to leap upwardly within the non-magnetic tube 14 for a forcible engagement against the lower end of the striker stem 26, impelling the striker head upwardly against the gong 28 to produce a single stroke upon the bell. The clearance between the tip of the striking head 27 and the gong 28 is such that after contact with the gong the striker head will fall back by gravity to clear the gong, the lower end of its stem 26 resting upon the top 33 of the

cylinder 20 which is retained in engagement with the bottom 31 of the steel bushing 25 as long as the solenoid is energized. This clearance of the non-magnetic striker from the gong eliminates any possibility of chattering which would occur otherwise. The tapered formation of the top 33 of the steel cylinder prevents sticking due to residual magnetism and immediately upon an interruption of the current circuit the solenoid will be deenergized permitting the cylinder 20 to drop back within the recess 19 of the lower cap nut whereupon the striker will be lowered to its original position as illustrated in Figure 1. It is apparent that no delicate adjustment of parts is necessary in the present construction as due to the striking impetus of the cylinder 20 the striker head will be projected upwardly to contact with the gong with considerable force.

While I have illustrated and described certain details entering into the construction and operation of the apparatus, I desire it to be understood that the invention is not to be limited thereby but that any desired changes and modifications may be made in the structural details as will fall within the scope of the invention as claimed.

I claim:

An audible signal apparatus comprising a solenoid coil adapted to be included in an alternating current circuit, means for mounting said coil in a vertical position upon a support, a sound producing element, disposed above said coil, a sleeve of non-magnetic material disposed through said coil and extending beyond the opposite ends thereof with its ends externally threaded, a magnetic bushing disposed in the upper end of said sleeve; a head on said bushing and extending laterally over the upper end of said sleeve for suspending said bushing within said sleeve; a member threaded over the externally threaded upper end of said sleeve for clamping the head of said bushing against the end of said sleeve, a striker slidably disposed through said bushing; a magnetically controlled member disposed in said sleeve for projecting said striker into forcible contact against said sound producing element; and a closure member internally threaded to engage over the lower end of said sleeve and secure said coil to a support.

In testimony whereof I have affixed my signature.

ALLAN F. LAKE.