(No Model.)

W. H. ORPEN, Jr.

ELECTRIC BELL ALARM.

No. 514,960. Patented Feb. 20, 1894.

Fig. 1.

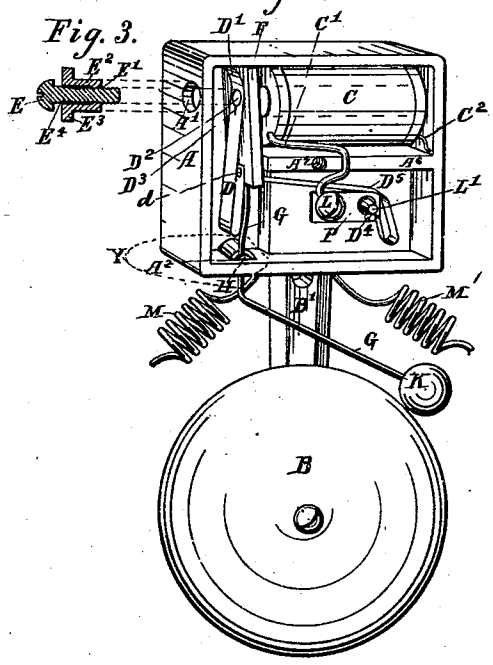


Fig. 3.

Fig. 2.

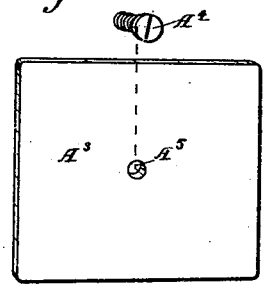


Fig. 4.

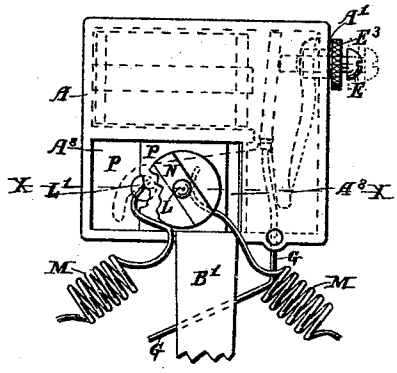


Fig. 6.

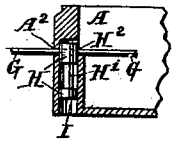


Fig. 7.

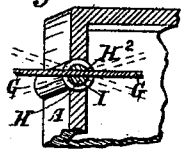
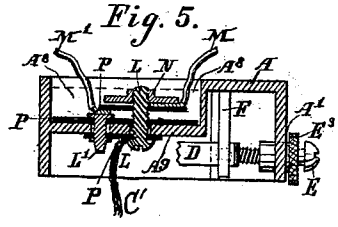


Fig. 5.



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ELECTRIC BELL-ALARM.

SPECIFICATION forming part of Letters Patent No. 514,960, dated February 20, 1894.

Application filed April 29, 1891. Serial No. 390,982. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. ORPEN, Jr., a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Electric Bell-Alarms, of which the following is a full and true description, enabling others skilled in the art to which it pertains to make the same.

My invention relates to the mechanism for ringing bells by electric vibration.

Its object is to afford complete protection to the mechanism, the utilization of the necessary construction screws for binding posts, and general simplification of parts—more specifically described and illustrated in the accompanying drawings, in which like letters refer to like parts in each.

Figure 1 is a perspective of the device with cover removed. Fig. 2 is the cover plate and screw. Fig. 3 is a section of the armature stroke regulating screw, and tension spring thimble. Fig. 4 is a plan view of back of device, with dotted lines showing position of mechanism in front compartments. Fig. 5 is a section through lines X. X. of Fig. 4. Fig. 6 is a corner section enlarged, of that portion of the device embraced within the dotted lines Y Fig. 1. Fig. 7 is an enlarged section of case, hammer rod journal and journal box, within the dotted lines Y, of Fig. 1.

A. is a metallic case, with perforations A′, and A^2, removable front plate A^3, screw A^4, and screw hole A^5, partition A^6, screw hole A^7, and recess in the back A^8, with dividing wall A^9.

B. is a bell.

B′ is a bell-post.

C is a magnet.

C′ is one pole of magnet coil in contact with binding screw L.

C^2 is a pole of magnet coil in contact with case A.

D is a tension spring.

D′ is a curved end of tension spring.

D^2 is a hole in, and D^3 is a slot in spring.

D^4 is the contact point of spring contact D^5.

d, is a pin passing through armature to hold D, and D^5 in position.

E. is a screw regulating the stroke of the armature, threaded at E′ to the thimble E^2, which has a flange E^3, and an annular chamber E^4.

F is the armature.

G is the hammer rod of the bell.

H is the journal.

H′ is the groove on the journal.

H^2 is a hole through the journal through which the hammer rod passes and in which it is held.

I is the journal box, in which the journal forming the axis of the hammer rod G operates.

K is the bell hammer.

L, and L′, are screws passing through the wall A^9, and acting as clamp screws, conductors, and contact points, for the connection wires.

N. is a disk which has a threaded hole in its center through which screw L passes.

M. M′, are circuit wires.

P. P. are insulators.

The box A, is provided with a removable cover plate A^3, which is adjusted on the box by means of the screw A^4 passing through the screw hole A^5 and into a threaded hole in the partition within the box A^6, by the arrangement of this partition, a separate compartment is provided for the magnet C, and it is completely incased in iron, forming a perfect magnetic circuit—another chamber is occupied by the tension spring D, armature F, and armature and tension regulators E, and E^2, a third chamber is for the clamp screws L forming the contact point of the magnet wire C′, and L′, the contact point for the spring attached to the armature.

The tension spring D, Fig. 1, is bent somewhat in the shape of the letter **S**, at one end it is attached to the armature F, and at the other end it forms when working a resilient terminal in contact with the inner wall of the case A, there is a circular hole D^2, at this, or near this end, with a slit running from it D^3, the hole D^2 is for the purpose of engaging the screw E, and as the tension spring is thin, the slit is made and the edge turned up, this gives the thread on the end of the screw E a chance to engage the thin metal of the tension spring, the turned end of the tension spring D′, when the screw E is in position, abuts against the inner side of the case A,

and prevents the thimble shaped screw case E^2 from leaving the hole A', in the case A; the screw E is threaded, and is placed inside the thimble E^2, which is only threaded on its inner end E', the rest of the interior of the screw case is an annular space E^4. The object of having only a few threads on the screw case is to reduce the amount of the friction of the screw, as it performs a function entirely distinct from the screw case. This screw case is in the form of a hollow truncated cone, the outside of which is smooth and slightly conical in shape, in order to make as tight and dust proof a connection as possible, when in position in orifice A'; the armature F, is attached to the end of the bell hammer rod by means of which it is suspended as explained farther on. The connection between the magnet and the battery poles is through the screw L, which clamps the end of one pole, and the flexible flat spring D^5, which may be a continuation of the tension spring, or a separate spring attached to the armature at the same point as the tension spring, this spring has a flat and curved end D^4, which makes a sliding contact with the contact point L', the clamp screws L and L', are simply reversed screws; that is to say, the head of L appears in Fig. 1 on the front, the head of L' on the back of device. This is best shown in Fig. 5—in that figure, it will be seen that the two screws mentioned L, and L', perform the office of binding posts. These screws are properly insulated by rubber plates P, and the connecting wires M M' are clamped to, and in contact with, the screws L and L'. Upon the back of the case a recess A^8 is formed, which has two insulated holes to admit the clamp screws L, and L', passing through, (Fig. 5,) the insulating plates P, and screws L and L' are held firmly as are also the ends of the wires M M' and C' by a disk N, which engages the thread of the screw L'. The hammer rod G, is journaled at its axis in a box I, formed in and an integral part of the case A, upon one end of the same, Figs. 6 and 7. It will be seen by referring to these figures, that the journal box does not extend through the width of the case A, and that the journal H is grooved out in the center at H', so as to form two heads H, H, connected in the center H', somewhat in the form of a spool—the object in this is to obtain a steady movement to the bell rod, with as little friction as possible. The rod G passes through and is attached to one of the heads of this journal Fig. 7, and through a passage A^2, in the case A, as the hole A^2, is completely closed by the journal H the possibility of insects or dust entering the case is removed.

The operation of the mechanism does not essentially differ from others of a like character, the battery current passes in through the connection Fig. 1, M, and through the clamp screw L, from thence it passes through the magnet wire C', through the magnet C, whose opposite pole C^2 is in contact with the case A, thence through the armature which is in contact with the case A, through the contact spring D^5, and through the contact point D^4, and screw point L', Fig. 5, which forms the binding screw for M', the circuit is now complete. The screw E, Fig. 1, passes through the thimble E^2 and through the hole D^2 in the tension spring, which it engages and draws closely to the end of screw case at E', the resilient terminal D', of the spring D, impinges against the inner wall of the case A, it will thus be seen that the screw case E is held in position by frictional contact with the walls of the orifice A' and prevented from leaving its position by the spring terminal D' and the flange on the outer end as the armature of the magnet vibrates and causes the bell to ring. When a change is desired in the tension of the spring D, the thimble E^2 is turned, carrying the screw E with it, and the spring D advances, or recedes, along the thread of the screw E; when a change in the stroke of the armature F is desired, the screw E only, is turned, and as it passes through the thread in the thimble E', it lengthens or shortens the stroke by impinging its end against the armature. The screw E, when moved alone does not alter the tension of the spring D.

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

1. A receptacle for the mechanism of an electric alarm, consisting of a case with a removable front a journal box integral with the case, a recess in the back divided from the ringing mechanism by a wall, and a partition separating the mechanism, as herein described and set forth.

2. In a case containing an electric alarm, the combination of a vibrating armature suspended by the hammer rod, and a tension spring having resilient terminals, attached at one end to the armature, the other end completing the circuit by abutting against the inner walls of the case, as herein described and set forth.

3. The combination in an electric bell alarm, of a tension spring with resilient terminals, one end of which is fixed to the armature of the magnet, the other end abuts against the inner walls of the case and thereby completing the circuit, and a flanged thimble regulator for the spring, as herein described and set forth.

4. In an electric bell alarm the armature stroke regulating screw herein described, adapted to control the excursion of the armature F between the point of the said screw and the magnet C, in combination with the case A, thimble E^2, tension spring D, with perforation D^2 and slot D^3, spring D^5 and contact point D^4, as and for the purpose herein described and set forth.

5. In an electric bell alarm the journaled bell rod herein described, consisting of a bell

rod passing through and connected to a journal located in a closed journal box constituting an integral portion of the perimeter of a case containing the ringing mechanism of an electric bell, and having the armature of the magnet suspended on its end, as herein described and set forth.

6. The combination in an electric bell alarm of a hammer rod passing through a journal and through a hole in a case containing the electric mechanism and a spool shaped journal, operating in a journal box constituting an integral part of the case, as herein described and set forth.

7. The combination in an electrical alarm bell of a hammer rod passing through a journal operating in a journal box constituting an integral part of a case containing the ringing mechanism of an electric alarm, with the armature of the magnet suspended on its end, and a curved spring attached to the armature, having resilient terminals, one terminal abutting against the inner walls of the case and the other completing the electric circuit by a sliding and spring contact with a fixed contact point when the armature vibrates.

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Witnesses:
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