

(No Model.)

W. J. NEWMAN.
ELECTRIC BELL.

2 Sheets—Sheet 1.

No. 501,292.

Patented July 11, 1893.

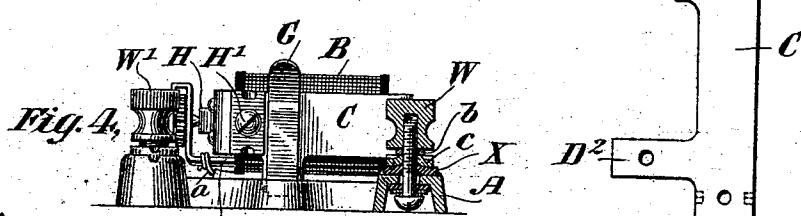
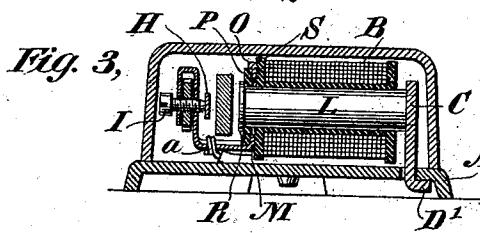
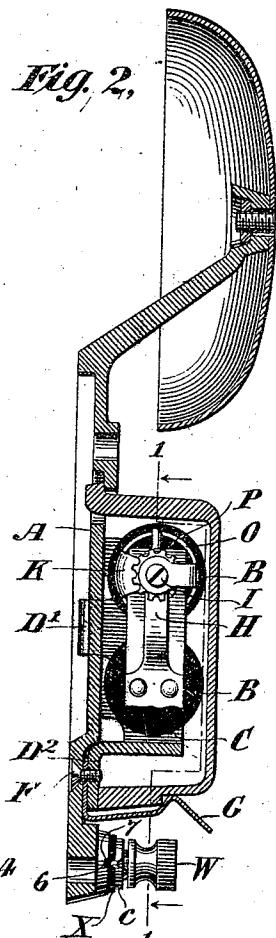
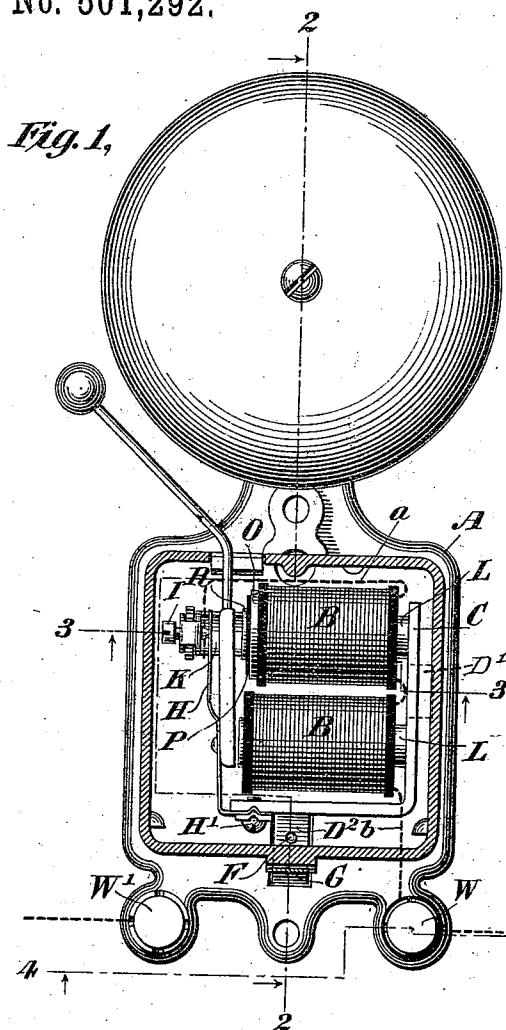
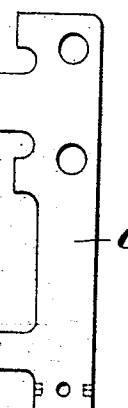


Fig. 5.



Witnesses

C. E. Ashley
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By his Attorney

Inventor
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H. L. Townsend

(No Model.)

2 Sheets—Sheet 2.

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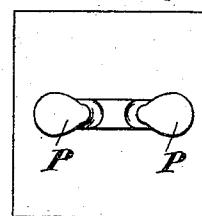


Fig. 15.

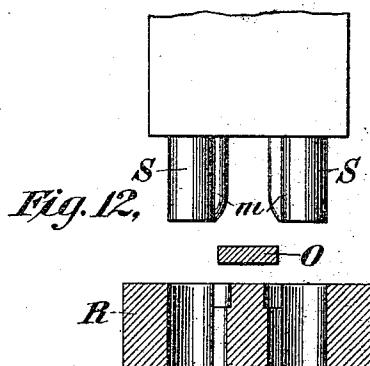


Fig. 12.

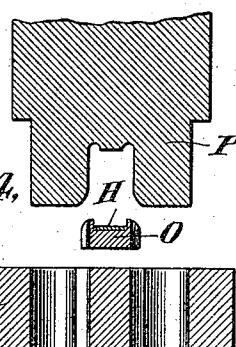


Fig. 14.



Fig. 13.

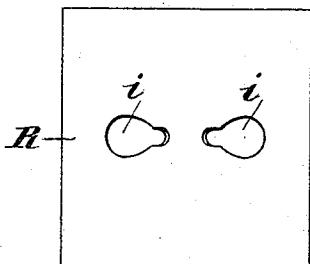


Fig. 9, Fig. 10, Fig. 11, Fig. 6, Fig. 7,

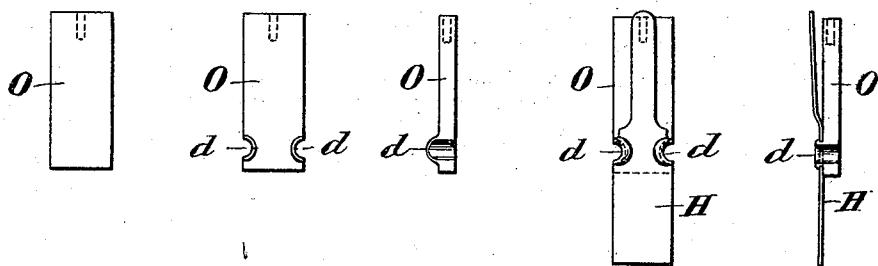


Fig. 8, Inventor

Witnesses

C. E. Ashley
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UNITED STATES PATENT OFFICE.

WILSON J. NEWMAN, OF BROOKLYN, NEW YORK, ASSIGNOR TO HENRY E. BAXTER AND CHANNING BAXTER, OF SAME PLACE.

ELECTRIC BELL.

SPECIFICATION forming part of Letters Patent No. 501,292, dated July 11, 1893.

Application filed October 28, 1892. Serial No. 450,243. (No model.)

To all whom it may concern:

Be it known that I, WILSON J. NEWMAN, a citizen of the United States, and a resident of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Electric Bells, of which the following is a specification.

My invention relates to improvements in the manufacture and in the details of construction of electric bells, and consists in the details of construction and combinations of devices hereinafter described and specified in the claims.

The invention relates more particularly to the manner of combining the magnet with its cast iron base, the mounting of the armature stop so that they cannot become displaced in position with relation to one another, the manner of mounting the conducting post in the conducting base so that it shall be kept insulated from said base and other features more particularly hereinafter described.

In the accompanying drawings:—Figure 1, is a plan of a bell embodying the invention the case being taken on the section line 1, 1, of Fig. 2. Fig. 2, is a vertical cross section through the bell on the line 2, 2, of Fig. 1. Fig. 3, is a cross section through the bell on the line 3, 3, of Fig. 1. Fig. 4, is an end elevation and cross section on the line 4, 4, of Fig. 1. Fig. 5, illustrates the blank used for forming the yoke piece and support of the armature. Fig. 6, shows the armature and supporting spring secured together in the preferred manner. Fig. 7, is an edge view of the same. Fig. 8, is a cross section through the spring and armature at the point of attachment. Fig. 9, illustrates the armature blank. Fig. 10, shows the same as formed preparatory to the attachment of the armature-supporting spring. Fig. 11, is an edge view of the armature shown in Fig. 10. Fig. 12, illustrates the device employed in forming or shaping up a burr or ridge at one side of the armature. Fig. 13, shows in plan the shape of the support for the armature in the forming or shaping operations. Fig. 14, illustrates the apparatus used in upsetting the burr or ridge to fasten the armature to the spring. Fig. 15, shows in end elevation the

form of the tool used in the upsetting operation.

A, indicates the cast iron base of the bell and B, B, the spools of the electro-magnet. Heretofore it has been the common practice to cast the base to an upright projection which forms a yoke piece for the cores of said magnet and to which they are directly riveted or secured. When the bell is so constructed it is necessary to drill holes in said projection since owing to the brittle nature of the material the holes cannot be punched; even when the holes are drilled there is considerable waste from accidental breakage. One of the aims of my invention is to overcome this difficulty and to cheapen and facilitate the rapidity with which the apparatus may be constructed. To this end I form the yoke piece separately from the base, by means of a suitable punch which gives it proper shape and in the same or another operation punch the hole in the hole for the reception of the magnet cores. As material different from that forming the cast metal base plate may be employed for the yoke piece under these conditions, the holes may be punched and the necessity for drilling is avoided.

C, is the yoke piece for the magnet cores which is formed of a piece of metal separate from the base A, and as shown has an extension at right angles to the yoke piece proper, said extension running parallel to the magnet cores and forming, as will be presently described, a support for the armature at the opposite end of said core. The yoke piece is also provided with two arms or projections D', D², the former of which constitutes a hook adapted to engage with the base plate by a slot E, in the latter while the other projection or arm D², has a perforation stamped in it and tapped for the reception of a fastening screw or bolt F, which passes through the base A. The blank from which the yoke piece formed with these projections or extensions may be made is shown in Fig. 5. It may be stamped from a single piece of metal and afterward bent to form the longitudinal extension and the projections D², D', adapted for use as just described. The screw F, serves also as a means for holding a catch G, which

is a spring catch, for the cover of the magnet, and has its foot engaged beneath the projection D^2 , so that it will be held firmly down upon the base. In this construction but one 5 bolt or screw is required for holding the magnet firmly upon the base and practically all the work may be done by a stamping and pressing operation while drilling is entirely avoided.

10 H , is the support for the armature of the electro-magnet. It consists of a spring having a rectangular extension at its lower end as shown where it is fastened against the longitudinal extension of the yoke piece by 15 means of a screw H' . The preferred way of securing the armature of the electro-magnet to this spring H , is shown in other figures of the drawings and will be presently described.

When, as in the present case, the armature 20 carries an electric contact designed to work in conjunction with an electric contact stop, it is very necessary that it should not be allowed to turn or move out of proper relation to said stop. To secure this result while at 25 the same time fastening it firmly in position by a simple and effective device, the foot of the spring where it rests against the yoke piece is provided with a nick or indentation which may be made by the stamping operation, and the yoke piece is correspondingly nicked or indented so that when the two are placed in connection and fastened by a screw and nicked or indented washer there is no opportunity for one to turn upon the other.

30 I , is the back stop-screw for the armature. This stop is fastened on an arm K , which is secured to one of the cores of the electro-magnet.

35 L , indicates the core and M , a metal ring or 40 plate provided with an upturned rim or flange O . The ring or plate M , has a perforation at its center somewhat larger than the diameter of the core L , so that it shall not make contact with said core, and is kept out of connection with the core by a washer P , of insulating material which lies upon the face of the ring M , and within its rim O . The ring or plate M , is secured between the end of the coil B , and the head R , of the core. This 45 head R , is preferably made by upsetting the end of the core in a press or by any suitable means which may be readily done inasmuch as the core is of soft iron.

50 S , is the usual flange or insulating head for 55 the coils of the magnet. The ring M , from which the arm K , extends is a piece integral with M , and is firmly held in position in obvious manner by being clamped between the head R , and the end of the coils B , when the 60 core is fastened to the yoke piece, and the arm will thereby be prevented from turning in a manner to displace the contact stop I . One terminal of the coils B , is connected directly to the arm K , and the stop I , by the soldering of the free terminals a , to said arm K , or by making connection in any other suit-

able manner. This connection can be made at the same time that the magnet is secured to its yoke piece and before the electro-magnet with the parts mounted thereon and the 70 base piece to which it is to be fastened are assembled and secured together. The other terminal b , of the coils is joined in the usual manner to a proper binding post W , which is insulated from the base A . The opposite 75 binding post W' , is in direct connection with the base and hence in connection with the armature of the electro-magnet and the contact carried thereby. The post with which the terminal b , is connected is kept out of 80 contact with the base A , by means of a washer X , of insulating material upon which base c , of the post rests, as shown in the cross sectional view. The lower extension of the post, or the screw which fastens the post in position on the base passes through an enlarged opening in the base in obvious manner and must be kept from lateral movement in order to preserve the insulation. To prevent this lateral movement I provide the insulating 90 disk X , with two or more nicks or indentations 6 , as shown, which are on radial lines making an angle with one another so that when said nicks or indentations engage with nicks or indentations 7 , of the base, the insulation will be prevented from moving in any direction and the post being, by means of its base c , engaged with the insulation through similar nicks or indentations, movement of the latter will be effectually prevented. 100

I will now proceed to describe the preferred manner of attaching the armature O , to the supporting spring H .

Fig. 9, shows the armature blank as consisting of a rectangular piece of iron of the usual shape. At the points d , on the edge of the said armature blank I form in a suitable press two burrs or ridges made by pressing or swaging the metal at the edge of the armature by means of an instrument such as 105 indicated in Fig. 12. This instrument operates somewhat after the manner of a punch which leaves the indentations or semi-circular recesses in the edge of the armature as shown in Fig. 10, but the metal removed so 110 as to form said indentations appears in the ridge or burr d .

115 R , is the bed or plate upon which the armature O , is supported in the operation and S , is the tool that forms said ridges or burrs. 120 The bed R , is provided as usual with the openings at i , Fig. 13, which correspond in shape to the tool faces—and receive the same when the latter is brought down with suitable pressure upon the edges of the armature, 125 said tool being in end elevation substantially of the form indicated by the openings i . The swaging or forming surfaces which take hold of the edge of the armature and press the material out into the ridge or burr are indicated 130 at m . The armature supporting spring H , is provided with semi-circular grooves or re-

cesses at its edge adapted to conform to the burrs *d*, and is fastened down upon the armature by upsetting the burrs or ridges *d*, down upon the spring *H*, as indicated in Figs. 6, 5 7 and 8. The upsetting apparatus is indicated in Fig. 14.

T, is the supporting plate for the armature in the upsetting operation and *P*, is the press which is forced down upon the armature and 10 engages the burrs *d*. The face of the tool *P*, where it engages the burr is formed as shown, so as to confine the burrs as they are upset and prevent them from spreading out unduly over the surface of the spring. This 15 manner of securing the spring and the armature together is effective and is cheap in manufacture.

What I claim as my invention is—

1. The combination, substantially as described, of the base plate having a slot, the electro-magnet, and a yoke piece for said magnet provided with two projections as described, one constituting a hook that engages with the slot in the base plate and the other serving 25 for engagement of a fastening screw or bolt.

2. The combination with the base plate, of the electro-magnet, a yoke piece having an arm or projection by which it is fastened to the base plate, and a catch for the cover fastened beneath said projection.

3. In an electric bell, the combination with a base plate, of an electro-magnet having its armature mounted on an extension of a yoke 35 piece formed independently of the base plate, the contact fastened to the magnet core, and means for fastening the yoke piece to the base plate, as and for the purpose described.

4. The combination with an electro-magnet, 40 of an arm fastened between the end of the magnet coil and a head of the magnet core consisting of the upset metal of the end of said core, and an armature stop mounted on said arm.

45 5. The combination with an electro-magnet, of an arm fastened between the end of the magnet coil and a head of the core consisting of the upset metal of the end thereof, an insulating washer between the upset iron head

of the core and said arm, and an armature 50 stop mounted on said arm.

6. The combination with the electro-magnet, of the metal ring flanged at its rim and having a supporting arm, the insulating washer within the rim, and the headed core, 55 as and for the purpose described.

7. The combination with the magnet core, 60 of the metal ring encircling the end of the core and held in place on said core against the head of the coil by the upset metal of the core, a bent arm extending from said ring integral therewith and returning upon itself opposite the pole, an armature between the arm and pole, and a back stop mounted on the arm.

65 8. The combination with the electro-magnet, of the metal arm encircling the end of the magnet core but insulated therefrom and held against slipping from the core by the upset metal of the end of the core, a coil terminal 70 connected with said arm, a contact stop mounted on said arm, a yoke piece for the magnet having an extension carrying the armature, means for fastening the yoke piece to the metal base, and an insulating post 75 mounted on the base and connected to the opposite terminal of the magnet coil.

9. The combination with the post and the base, of the insulating washer nicked or indented at two or more points on radial lines 80 forming an angle with one another and engaging with corresponding indentations or projections on the base, as and for the purpose described.

10. The combination of an armature and a 85 supporting spring therefor secured to the armature by a burr or ridge formed of material punched or pressed out of a notch or recess in the edge of said armature and upset upon the supporting spring, as and for the purpose 90 described.

Signed at New York, in the county of New York and State of New York, this 26th day of October, A. D. 1892.

WILSON J. NEWMAN.

Witnesses:

W.M. H. CAPEL,
THOS. F. CONREY.