(Model.)

C. E. SCRIBNER.

POLARIZED BELL.

No. 264,109. Patented Sept. 12, 1882.

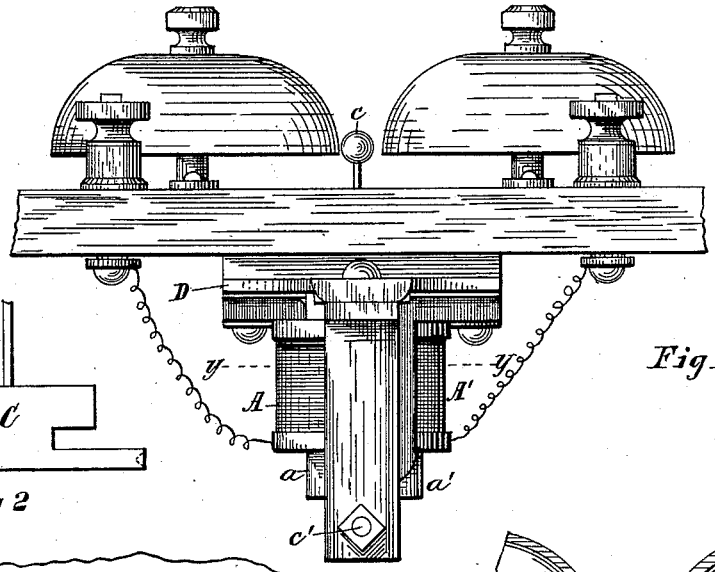
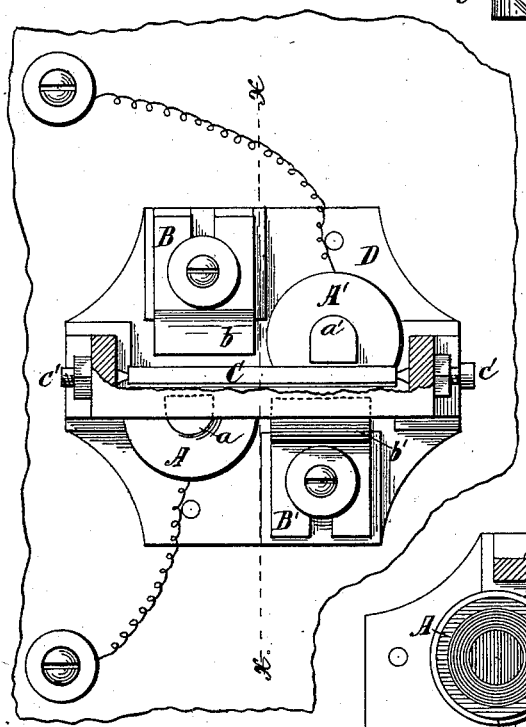


Fig 1

Fig 5

Fig 2



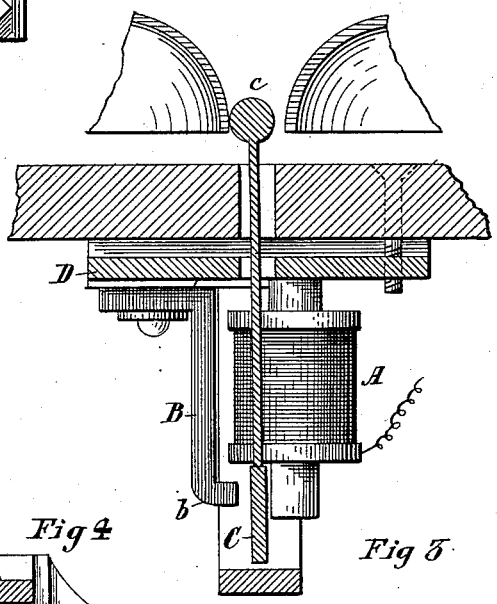
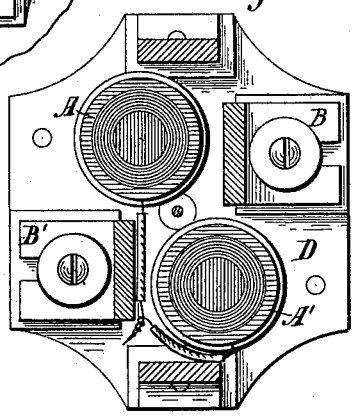


Fig 3

Fig 4



Witnesses

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UNITED STATES PATENT OFFICE.

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POLARIZED BELL.

SPECIFICATION forming part of Letters Patent No. 264,109, dated September 12, 1882.

Application filed October 18, 1880. (Model.)

To all whom it may concern:

Be it known that I, CHARLES E. SCRIBNER, of Chicago, county of Cook, Illinois, have discovered certain new and useful Improvements in Polarized Bells, 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 is an improvement upon that class of bells frequently spoken of as the "Siemens bell," in which a permanent magnet and armature carrying the bell-hammer are combined with an electro-magnet. The poles of the magnets, which are placed near the armature, are so arranged that a current passing in a given direction magnetizes one, N, and the other, S, and the contrary when the direction of the current is changed.

Heretofore the armature has been placed directly between the poles of the electro-magnets, which have sometimes been placed upright and sometimes end to end. When placed upright it has been usual to extend the poles at right angles to the cores and toward each other by soft-iron lugs. In either case the space between the two poles is only sufficient to admit the armature and allow it to vibrate. Either arrangement is objectionable, for in one case the extended poles and in the other the great length of the heel-iron connecting the extreme ends of the electro-magnets greatly diminish the magnetic force upon the armature. The most serious objection, however, is the loss of force upon the armature by reason of magnetic induction between the poles of the electro-magnets when thus placed in close proximity and only separated by the soft-iron armature. The armature has also been placed with its ends directly over the two poles of upright magnets and centrally pivoted between them. The permanent magnet is not adjustable when the armature and electro-magnets are combined, as described in either of the aforesaid arrangements.

By my improvement in the arrangement of parts a new mode of operation is effected and the aforesaid objectionable features removed.

In the drawings, Figure 1 is a front elevation of a polarized or magneto bell embodying my improvements. In Fig. 2 the same is seen from below, a portion of the cross-piece of the frame being broken away. Fig. 3 shows a section of the armature and bell-hammer upon line *x x*, Fig. 2. Fig. 4 shows a plan view from below upon section of line *y y*, Fig. 1.

Like letters of reference indicate similar parts in the different views.

The two electro-magnet spools A and A′ are placed diagonally instead of directly opposite each other. Instead of a single permanent magnet, I provide two, B and B′, placed diagonally, as shown. The armature C, to which is attached the bell-hammer *c*, is placed with its ends, respectively, between a pole of an electro and permanent magnet.

Instead of two permanent magnets, I may use a single horseshoe-magnet with the two ends polarized, N, and the bend or base polarized, S, or vice versa.

I will describe the operation of the bell on the supposition that the free ends *b b′* of the permanent magnets are polarized, N. On sending a current through the electro-magnet one pole—we will say pole *a*—becomes magnetized, S, and the other pole, *a′*, becomes magnetized, N. Pole *a′* and pole *b′* are now both magnetized, N, and when properly adjusted equally attract the armature C. Their attractive force upon the armature is thus neutralized, and were the armature influenced by these poles alone it would remain stationary. One end of the soft-iron armature is thus between two north poles, and its other end, by magnetic induction, will become magnetized, N. This end is between pole *a* and pole *b*, which, as above stated, are magnetized respectively S and N. Therefore the south pole, *a*, attracts while the north pole, *b*, repels this north end of armature C. Thus attraction and repulsion unite in moving the armature in one direction, in this case toward pole *a*. A reversal of the current changes the polarity of the electro-magnets, and pole *a* becomes magnetized, N, and pole *a′* becomes magnetized, S. Hence the armature by the same mode of operation is carried in the opposite direction. Thus rapid reversals of the current will cause the armature to vibrate with equal rapidity.

The cores or poles *a a'* of the electro-magnet may be round or of any suitable shape. I prefer, however, to flatten the side of the pole which is presented to the armature, as shown in the drawings, and prevent contact between them by means of a small brass piece attached to either the core or the armature. This small brass piece is not shown in the drawings.

The permanent magnets and electro-magnet are preferably attached to an iron plate, as shown. This iron plate forms a heel-iron for the magnets. I provide a slot in each of the permanent magnets for the screws which hold them to the iron plate, that any desired adjustment of the permanent magnets to the armature may be obtained before the screws are set. I provide a slot in the iron plate D for each of the screws which support the electro-magnets, and hence the electro-magnets may be moved to or from the armature. The armature is made preferably of the form shown in Fig. 5, and pivoted to the frame, as shown in Fig. 2, when my invention is applied to polarized bells, as above described. It is evident, however, that this arrangement of parts may be made effective in polarized relays, such as are used in quadruplex apparatus.

When I use a single permanent magnet in place of the two permanent magnets I fix it at the bend by a screw, which, when loosened, allows the magnet to turn upon the screw as a pivot. Thus when turned in one direction its two poles approach the ends of the armature and when turned in the opposite direction said poles recede from the armature, and thus the single permanent magnet is made adjustable.

I claim—

1. In a polarized bell or relay, an electro-magnet, in combination with a polarized armature placed between its poles, said poles being arranged diagonally and adapted to act alternately in different directions upon said armature.

2. The combination of the soft-iron armature with the poles of the electro-magnet and the poles of the permanent magnet, said poles being arranged diagonally to said armature, whereby the reversed currents tend to neutralize the magnetic force at one end of the armature, while attraction and repulsion unite at the other end of the armature to move the armature in the same direction.

3. In a polarized bell or relay, the combination of an electro-magnet with its poles placed diagonally at different ends of the armature, and permanent-magnet poles of the same magnetism placed diagonally at the different ends of the armature and opposite the poles, respectively, of the electro-magnet, whereby reversed currents sent through the coils of the electro-magnet neutralize the magnetic force at one end of the armature, while attraction and repulsion unite at the other end to move the armature.

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Witnesses:
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