J. H. BUNNELL & M. W. GOODYEAR.

TELEGRAPH SOUNDERS.

No. 190,191. Patented May 1, 1877.

Fig. 2.

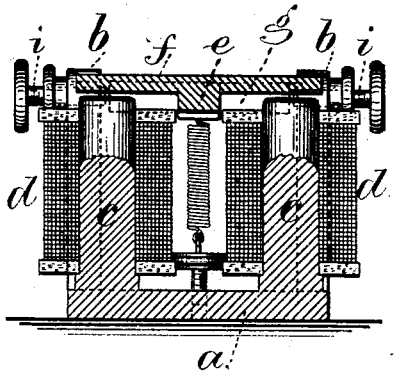


Fig. 3.

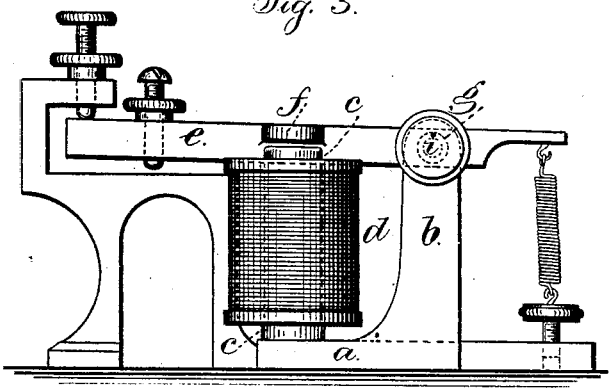
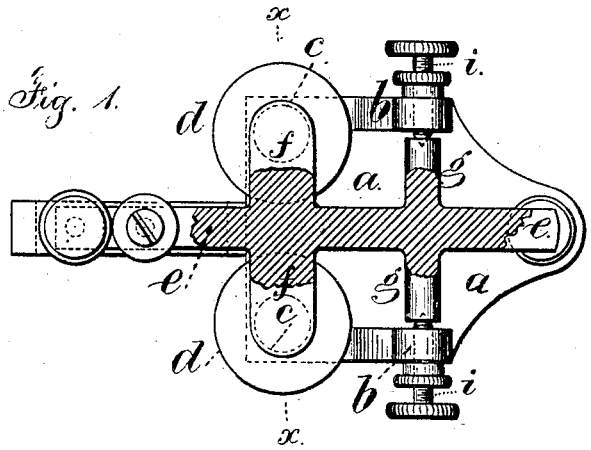


Fig. 1.



Witnesses,

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Atty.

UNITED STATES PATENT OFFICE.

JESSE H. BUNNELL AND MILES W. GOODYEAR, OF NEW YORK, N. Y.

IMPROVEMENT IN TELEGRAPH-SOUNDERS.

Specification forming part of Letters Patent No. **190,191**, dated May 1, 1877; application filed March 6, 1877.

To all whom it may concern:

Be it known that we, JESSE H. BUNNELL and MILES W. GOODYEAR, of the city and State of New York, have invented an Improvement in Telegraph-Sounders, of which the following is a specification:

Our improvement is made for lessening the expense in the construction of the sounder, and for preventing any of the parts becoming loose and misplaced, especially in the hands of inexperienced operators and learners.

Heretofore it has been usual to make the magnet-cores separate from the frame containing the armature-pivots. In these instruments the expense is enhanced in constructing the parts separately, and in uniting the cores to the frame, and the parts are liable to become misplaced, and the magnetic action lessened by looseness. The armature, lever, and axis have been made in three separate pieces united by screws; these are expensive, and liable to become loose and inoperative.

In the drawing, Figure 1 is a plan of the instrument. Fig. 2 is a cross-section at the line *x x*, and Fig. 3 is a side view of the same.

The frame *a*, with the pivot-standards *b*, and the magnet-cores *c*, are all cast in one piece of iron, and rendered malleable in the usual manner, in order that the cores may become magnetized by the action of the current in the helix *d*, that surrounds the cores.

The armature-lever *e*, armature *f*, and axis *g* are all cast in one piece of malleable iron, and the ends of the axis are countersunk to receive the ends of the pivot-screws *i*, that pass through the standards *b*. This construction insures great strength and accuracy, and the sound produced by the vibration of the same is much louder and clearer than those armature-levers made of separate pieces.

The cores and frame, being of malleable iron, become easily magnetized, and there is no necessity for adjusting the parts when once properly constructed.

We claim as our invention—

1. In the telegraph-sounder, the cores *c* of the electro-magnet, and the frame *a* and standards *b*, made in one piece of malleable cast-iron, substantially as set forth.

2. The armature-lever, armature, and axis of the telegraph-sounder, made in one piece of malleable cast-iron, substantially as set forth.

Signed by us this 24th day of February, A. D. 1877.

JESSE H. BUNNELL.
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Witnesses:
GEO. T. PINCKNEY,
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