

(No Model.)

2 Sheets—Sheet 2.

J. H. BUNNELL.
TELEGRAPHIC SOUNDER.

No. 538,816.

Patented May 7, 1895.

Fig. 3,

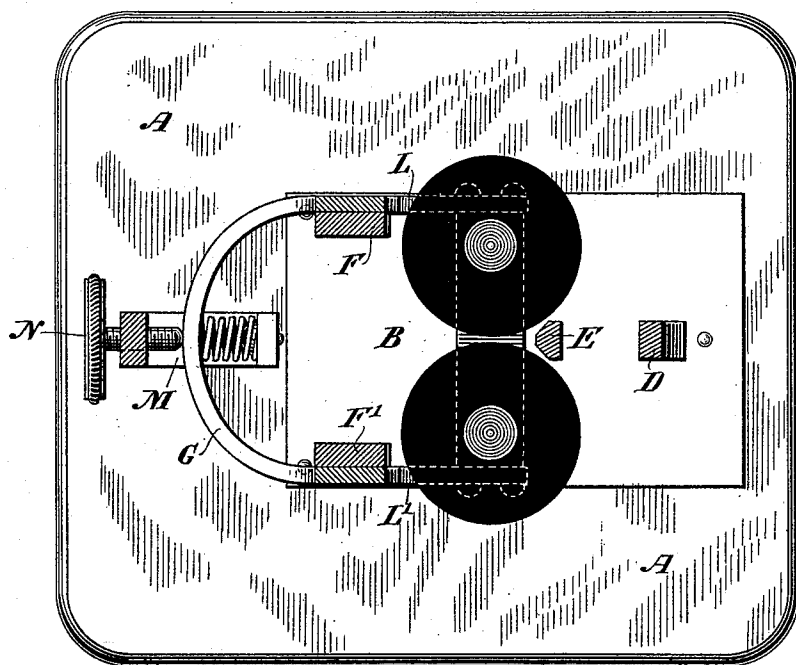
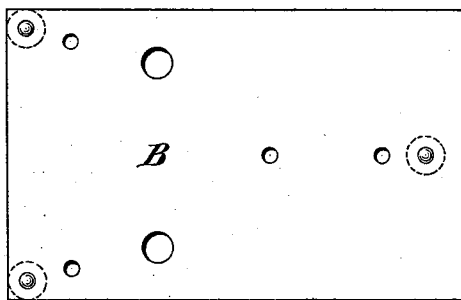


Fig. 4,



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TELEGRAPHIC SOUNDER.

SPECIFICATION forming part of Letters Patent No. 538,816, dated May 7, 1895.

Application filed April 19, 1893. Renewed June 21, 1894. Serial No. 515,317. (No model.)

To all whom it may concern:

Be it known that I, JESSE H. BUNNELL, a citizen of the United States, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Telegraphic Sounders, of which the following is a specification.

This invention relates to telegraphic sounders, the object being to increase the loudness and clearness of the sounds due to the blows of the armature, and thus to render the instrument more effective than those heretofore employed.

In carrying out my invention I mount the anvil upon which the armature strikes upon a sounding board or resonator, and so support the magnet co-operating with the armature, that the mass of metal of which it is composed cannot check or dampen the freedom of vibration of the anvil and its resonator. In addition to the main feature just referred to, of increasing the volume and clearness of sound emitted, there are certain other features of importance embodied in my instrument, more especially, the devices for securing convenience and delicacy of adjustment between the armature and its actuating magnet.

My invention consists in its broadest aspect of a telegraphic sounder whose operating electro-magnet is adjustably supported that neither its mass nor its connection with the base interferes with the freedom of vibration of the anvil or its attached resonator.

Other incidental features of novelty will be more particularly hereinafter described and will be definitely indicated in the claims appended to this specification.

In the accompanying drawings, which illustrate the invention, Figure 1 is a side elevation of a sounder embodying my improvements. Fig. 2 is a sectional view taken on the plane indicated by the line 2 2 of Fig. 1, part of the armature-bearing being also shown in section for the sake of clearness. Fig. 3 is a sectional view taken on the plane indicated by the line 3 3 of Fig. 1, and Fig. 4 is a plan view of the resonant base or sounding-board for the instrument.

Referring to the drawings, A indicates a bed or foundation plate preferably made of

hard wood or other light and cheap material, and provided with three or more supporting feet for holding it free from contact with the table or other supporting medium. Above this bed-plate is mounted a resonator B preferably of metal and supported at a plurality of points upon the bed-plate A by means of screws or other devices which serve to maintain it in a fixed relation thereto. Mounted upon the resonator between two of its points of support is the anvil C which co-operates with and receives the impact of the armature lever of the sounder. This anvil may be fixedly mounted upon one or more supporting feet preferably more than one, by which, as indicated at D, E, the vibrations due to the impact of the armature lever, are communicated to the resonator. At certain points of the resonator closely adjacent to its points of connection with the bed-plate, are fixed the two extremities F, F' of an arched standard or support hereinafter termed the trunnion-yoke, for the armature and electro-magnet. The electro-magnet is connected by its yoke with a movable cradle G herein shown as pivotally connected to the trunnion yoke at points H, H', through which extend adjustable set-screws I, I' which form the bearings for the axis of the lever K to which the armature is affixed. The cradle G is provided with extensions L, L' to which the yoke of the electro-magnet is rigidly affixed. Secured to the bed-plate A is an angular support M provided with two upward extensions, one of which serves as an abutment for a tension spring for the cradle as indicated, while the other serves as a support for an adjusting screw N for the cradle and a tension key O for the armature. The armature lever at the points where it makes contact with the anvil is provided with the usual upper and lower adjusting screws and jam nuts, as indicated. From this construction it will be seen that the vibrations communicated by the blow of the armature in the anvil are communicated to a resonator which has great freedom of vibration. The electro-magnet and the armature both being pivotally supported, and having their points of connection with the resonator at points very close to its points of attachment to the bed-plate, interfere to a minimum

degree with its vibrations, and hence a very loud and clear sound is emitted even by a comparatively weak stroke of the armature lever.

In the usual form of construction, in which the electro-magnet is rigidly fixed to the same plate which carries the anvil support, the vibrations of the anvil are dampened very considerably by the mass of metal forming the electro-magnet. In my construction the weight of the electro-magnet bears upon the resonator at nodal point, at which a minimum interference of vibration is created, and in addition to this the electro-magnet swings in a cradle independently mounted, which almost entirely eradicates any dampening influence upon the vibrations communicated to the resonator. Moreover the intensity of sound is materially augmented by the base A, the sides of which vibrate simultaneously with the resonator plate, thus making the resonant effect compound in action.

Another advantage resulting from the mode of supporting the electro-magnet herein described is that a great delicacy of adjustment is possible, because the adjusting screw N acts upon the end of a long lever, admitting of a very accurate and minute adjustment because a considerable number of turns of the screw will only shift the core of the magnet very slightly toward the armature. An approximate adjustment may be made by the screws mounted on the anvil and armature near the end of the latter, after which the more accurate adjustment may be accomplished by means of the screw N.

The features which have been described render the apparatus peculiarly well adapted for long lines having a comparatively feeble current, but it is to be understood that the invention is not restricted to such use.

I claim as my invention—

1. A telegraphic sounder comprising a resonator mounted upon a base at a plurality of points, an anvil rigidly connected to the resonator between said points, and an electro-magnet and armature mounted upon the resonator closely adjacent to its points of support, whereby said resonator is free to vibrate

independently of the inertia of the electro-magnet.

2. A telegraphic sounder comprising an anvil mounted upon a resonant base between its points of support, a support for the armature mounted closely adjacent to the points of support, an electro-magnet connected at or near its yoke, with a movable cradle similarly related to the points of support for the resonant plate, and a device for adjusting the electro-magnet and its cradle.

3. In a telegraphic sounder, the combination of its vibrating armature, a trunnion-yoke in which the armature is pivotally mounted, a cooperating electro-magnet also carried upon the trunnion yoke, and a resonator upon which the anvil of the armature is mounted.

4. A telegraphic instrument comprising a pivoted armature having suitable limiting stops, and a cradle to which the electro-magnet is rigidly secured at or near its yoke, said cradle being pivoted concentrically with the armature to admit of adjustment toward or from the armature, and an adjusting device for shifting the position of said cradle.

5. A telegraphic instrument comprising an armature provided with adjustable limiting stops, a cradle upon which the electro-magnet is mounted, said cradle being pivoted concentrically with the armature, and an adjusting screw near the free end of the cradle for the purpose described.

6. In a telegraphic sounder, a resonator plate supported at a plurality of points within its outer edges and not in contact with the main base at any point or points excepting those required for the supports, leaving said edges free to respond to vibrations communicated by an anvil seated within the area enclosed by said supporting points.

In testimony whereof I have hereunto subscribed my name this 18th day of April, A. D. 1893.

JESSE H. BUNNELL.

Witnesses:

CAROLINE E. DAVIDSON,
JESSIE B. KAY.