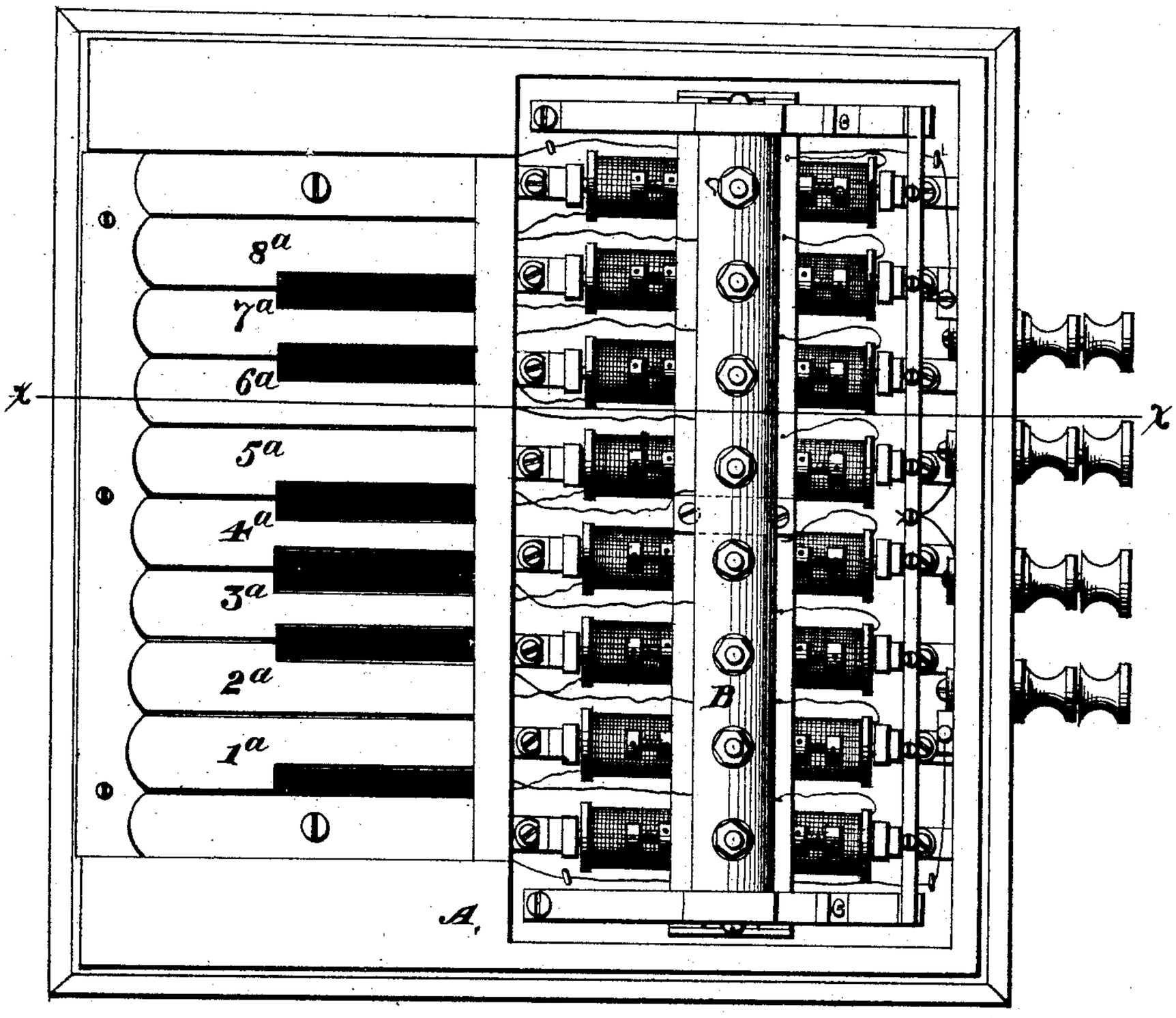
3 Sheets—Sheet 1

E. GRAY.

ELECTRO-HARMONIC TELEGRAPH.

No. 173,618. Patented Feb. 15, 1876.

Fig. 1.



WITNESSES

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3 Sheets—Sheet 2.

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Fig. 2

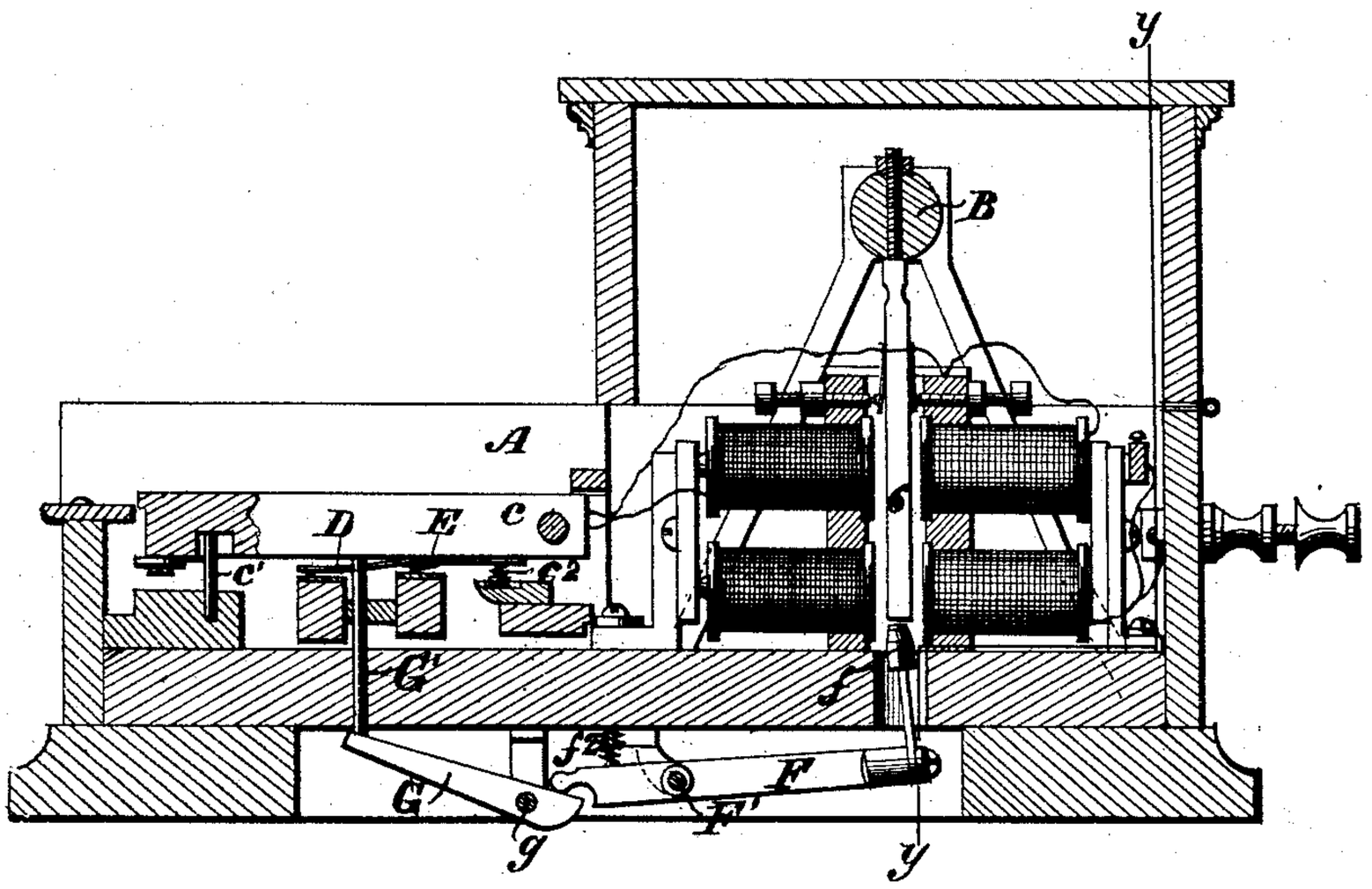
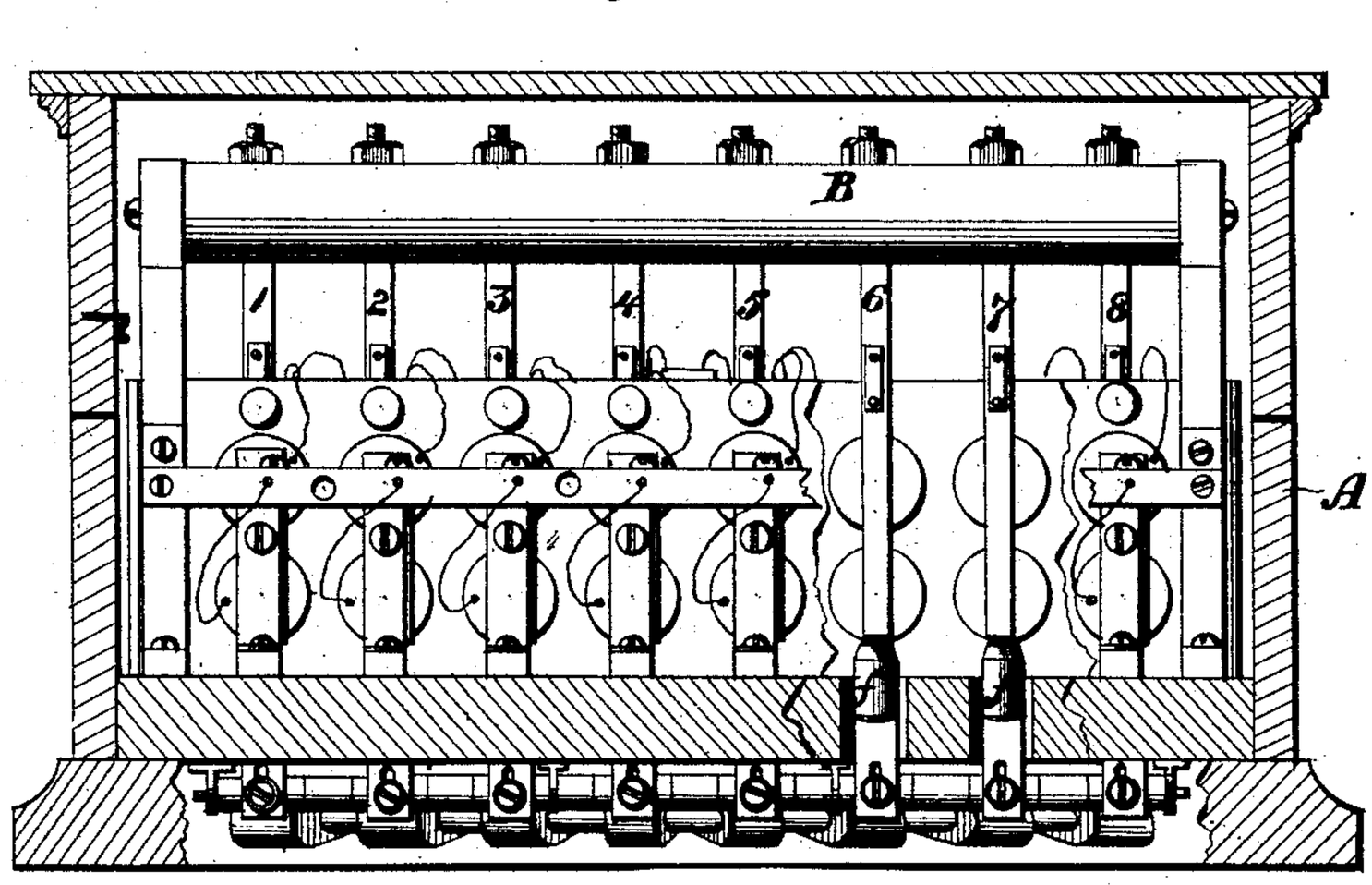


Fig. 3.



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3 Sheets—Sheet 3.

E. GRAY.

ELECTRO-HARMONIC TELEGRAPH.

No. 173,618. Patented Feb. 15, 1876.

Fig. 4.

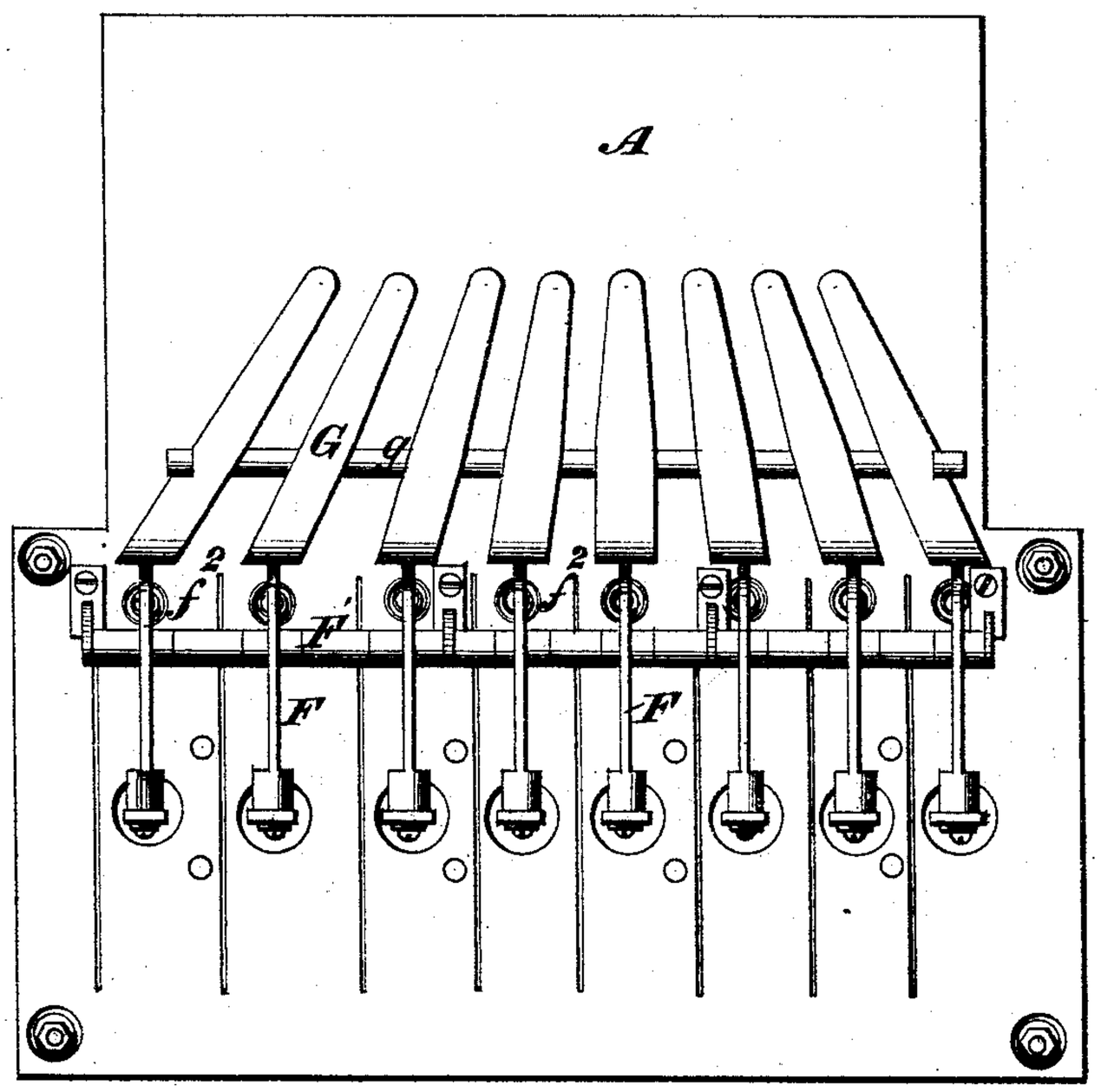


Fig. 5.

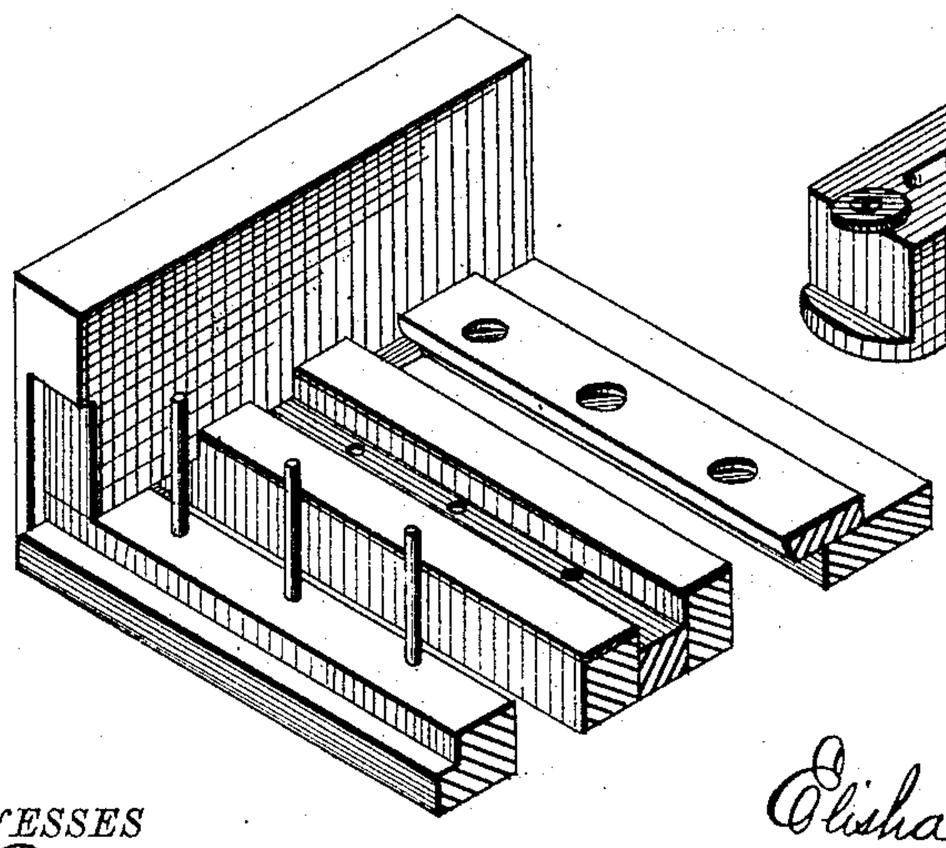
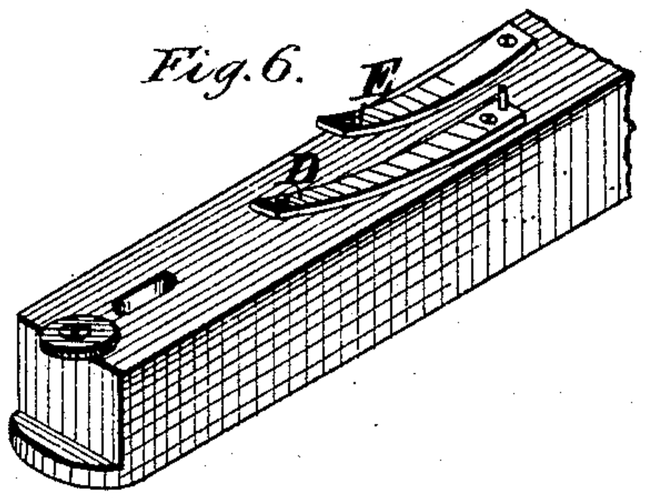


Fig. 6.



WITNESSES

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UNITED STATES PATENT OFFICE.

ELISHA GRAY, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN ELECTRO-HARMONIC TELEGRAPHS.

Specification forming part of Letters Patent No. **173,618**, dated February 15, 1876; application filed January 27, 1876.

To all whom it may concern:

Be it known that I, ELISHA GRAY, of Chicago, in the county of Cook, and State of Illinois, have invented a new and useful Art of Producing Musical Impressions or Sounds and Transmitting said Sounds Telegraphically, as well as improved apparatus for so transmitting said sounds, of which the following is a specification:

In Letters Patent of the United States granted me July 27, 1875, and numbered, respectively, 166,095 and 166,096, I have shown and described methods of transmitting musical impressions or sounds telegraphically.

My present invention relates to means whereby tunes may be played by a single operator, and reproduced, if desired, at a distant station by apparatus described in the patents above mentioned, or in other ways, for which applications for Letters Patent filed by me and now pending.

My invention primarily consists in a novel art of producing musical impressions or sounds by means of a series of properly-tuned vibrating reeds or bars thrown into action by means of a series of keys opening or closing electric circuits. It also consists in a novel art of transmitting tunes so produced through an electric circuit and reproducing them at the receiving end of the line. My improvements further consist in novel apparatus for the production and transmission of such tunes. The subject-matter claimed will hereinafter specifically be designated.

In the accompanying drawings Figure 1 shows a plan or top view of so much only of my improved apparatus as is necessary to illustrate the subject matter herein claimed; Fig. 2, a vertical transverse section therethrough on the line *x x* of Fig. 1; Fig. 3, a vertical transverse section therethrough on the line *y y* of Fig. 2; Fig. 4, a bottom-plan view of the instrument; and, Figs. 5 and 6 represent views in perspective of certain details of the mechanism.

The drawings show an electrical organ of a single octave embodying my improvements in the best way now known to me; obviously, however, the number of the keys may be increased, and the details of construction of the instrument may be varied in many well-known ways without departing from the principle of my invention.

The mechanism is shown as inclosed in a box or frame A. A series of vibrating reeds or electrotomes, 1, 2, 3, 4, 5, 6, 7, 8, each tuned to produce a note of different pitch, is shown as mounted in a bar, B, secured upon a stout frame.

The method of constructing and operating these reeds is fully shown and described in Letters Patent No. 165,728, granted to me July 20, 1875, and need not, therefore, be recapitulated here. Each vibrating reed forms part of an electric circuit which is opened and closed by its respective key 1^a, 2^a, 3^a, 4^a, 5^a, 6^a, 7^a, 8^a, which takes the place of an ordinary Morse key. Each key works on a pivot *c*, (see Fig. 2,) and has a guide-pin, c^1, to keep it steady. A spiral spring, c^2, holds the key up and keeps the circuits normally open. When a key is depressed, both the main and local circuits are closed by springs, D E, on the under side of the key, which form part of the circuit. The keys are in other respects like those of an ordinary melodeon.

To counteract the tendency of one reed to be thrown into sympathetic vibration by another when sounded, I mount a series of stops, *f*, each on its respective lever F, rocking on a pivot F′, and provided with a spring, f^2, by which each stop is normally pressed against the end of its vibrating reed after the manner of the dampers of a piano. The stop is withdrawn from the reed whenever its key is depressed, by means of a lever, G, rocking on a fulcrum, *g*, and actuated by a pin, G′, on the key. The vibration of the reed is thus instantly stopped as its circuit opens, and is promptly released the moment before the circuit closes to throw it into action again. The method of running the main and local circuits in this instance is similar to that shown in my patent No. 165,728, above mentioned.

By the mechanism above described, the operator is enabled to play any desired tune, which will be audible at the spot where played and which may be reproduced audibly at a distant station by means of the mechanism described in the Letters Patent of July 27, 1875, hereinbefore mentioned, as well as by other mechanism which forms the subject-

matter of applications for Letters Patent filed by me February 23, 1875, and January 8, 1876.

I claim as my invention—

1. The improvement in the art of producing musical impressions or sounds telegraphically, hereinbefore set forth, which consists in controlling a series of automatically and electrically vibrated reeds, producing tones of different pitch, by a series of keys arranged organ-fashion and adapted for manipulation by a single operator.

2. The improvement in the art of producing and transmitting tunes telegraphically, which consists in controlling a series of automatically and electrically vibrated reeds, producing tones of different pitch, by a series of keys arranged organ-fashion and adapted for manipulation by a single operator, transmitting the tune thus produced through an electric circuit and reproducing it at the receiving end of the line, substantially in the manner described.

3. The combination, substantially as hereinbefore set forth, of a series of electrically-vibrated reeds and a corresponding series of keys for controlling them, arranged organ-fashion and adapted for manipulation by a single operator.

4. The combination, substantially as hereinbefore set forth, of the vibrating reeds, the keys, and the stops actuated by the keys to control the reeds.

5. The combination, substantially as hereinbefore set forth, of an electrical organ, an electric circuit, and a receiver in said circuit which reproduces the tune played by the organ.

In testimony whereof I have hereunto subscribed my name.

ELISHA GRAY.

Witnesses:
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H. T. EARNEST.

1.250