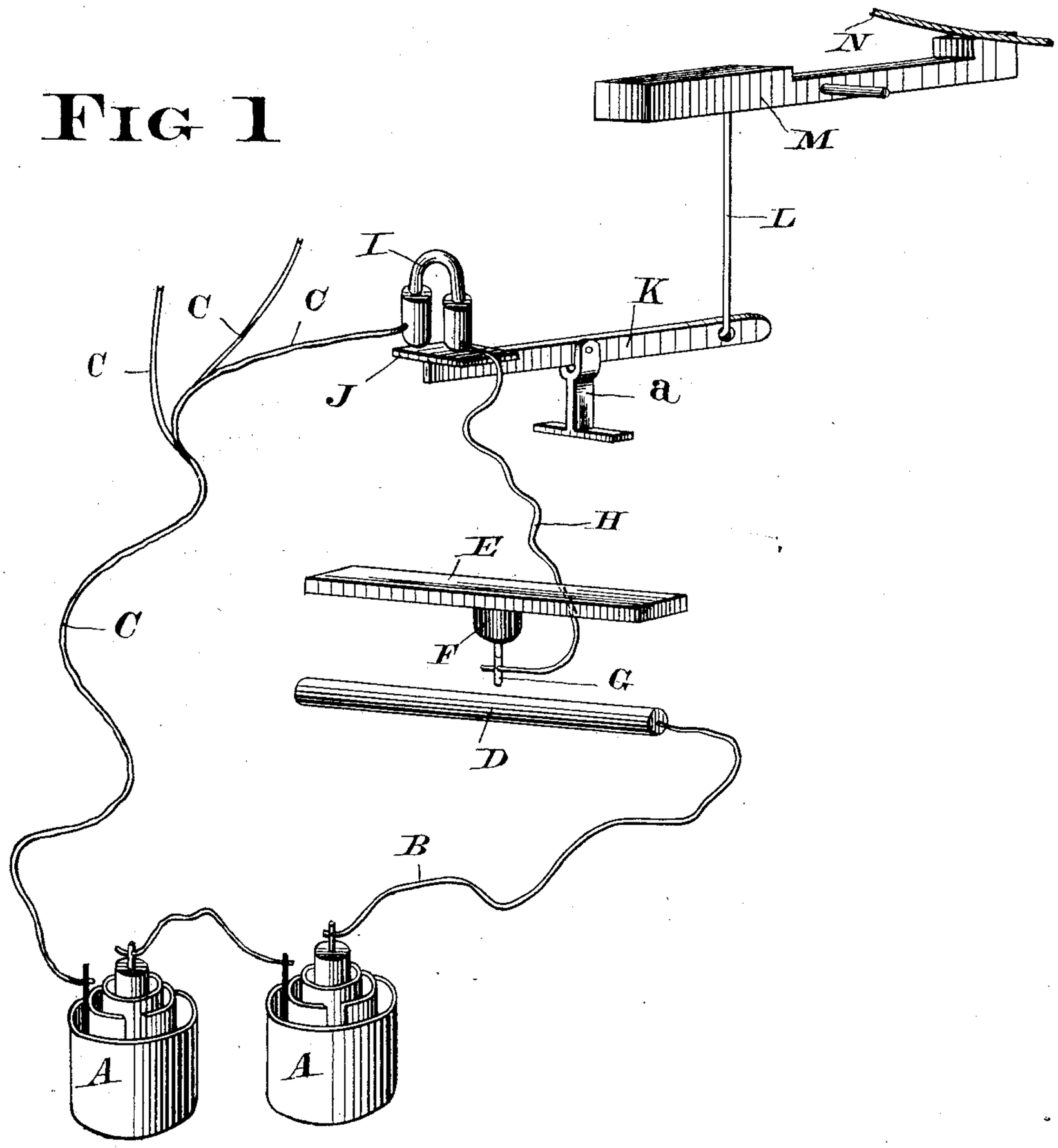
(No Model.) 2 Sheets—Sheet 1.

C. N. ANDREWS.

ELECTRO MAGNETIC ACTION FOR MUSICAL INSTRUMENTS.

No. 258,871. Patented June 6, 1882.

FIG 1



Witnesses

Wilmer Bradford

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Inventor

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Attorney

(No Model.) 2 Sheets—Sheet 2.

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No. 258,871. Patented June 6, 1882.

FIG 2

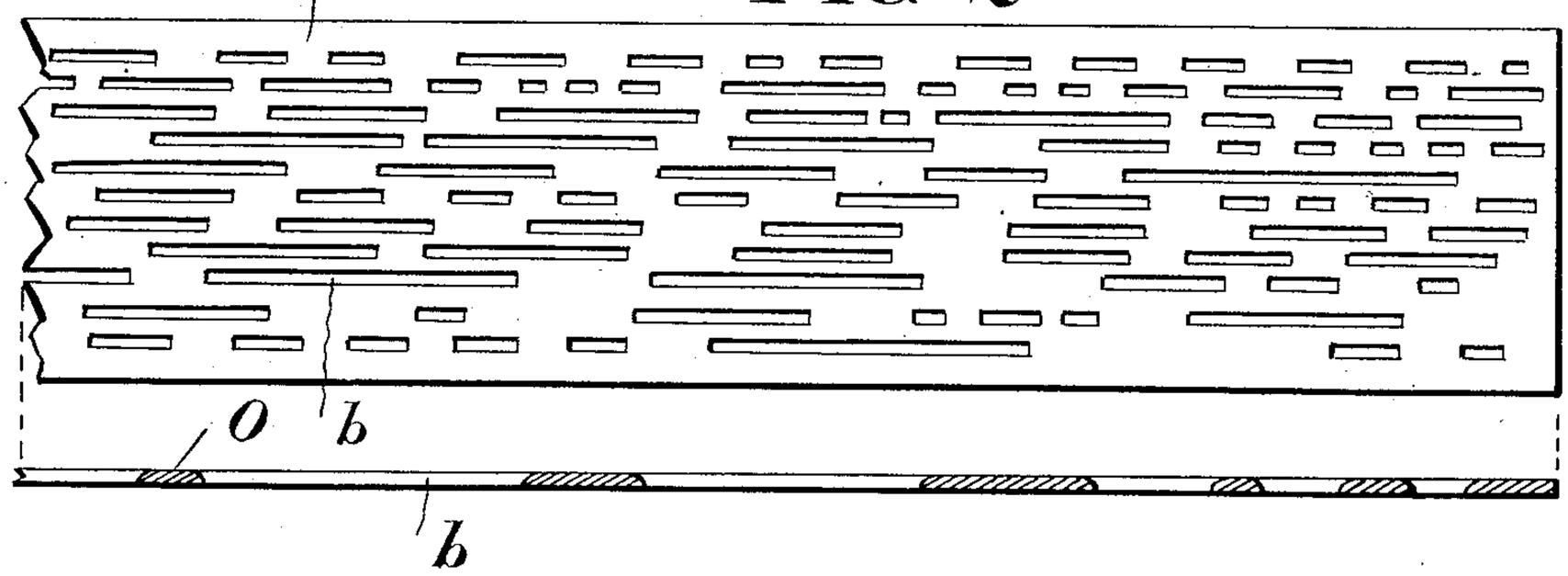


FIG 3

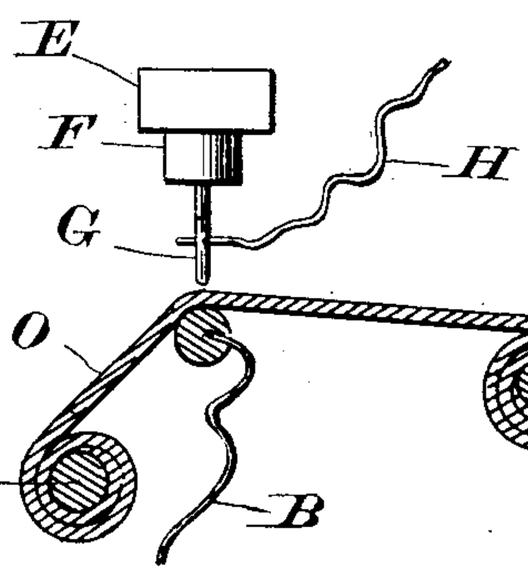
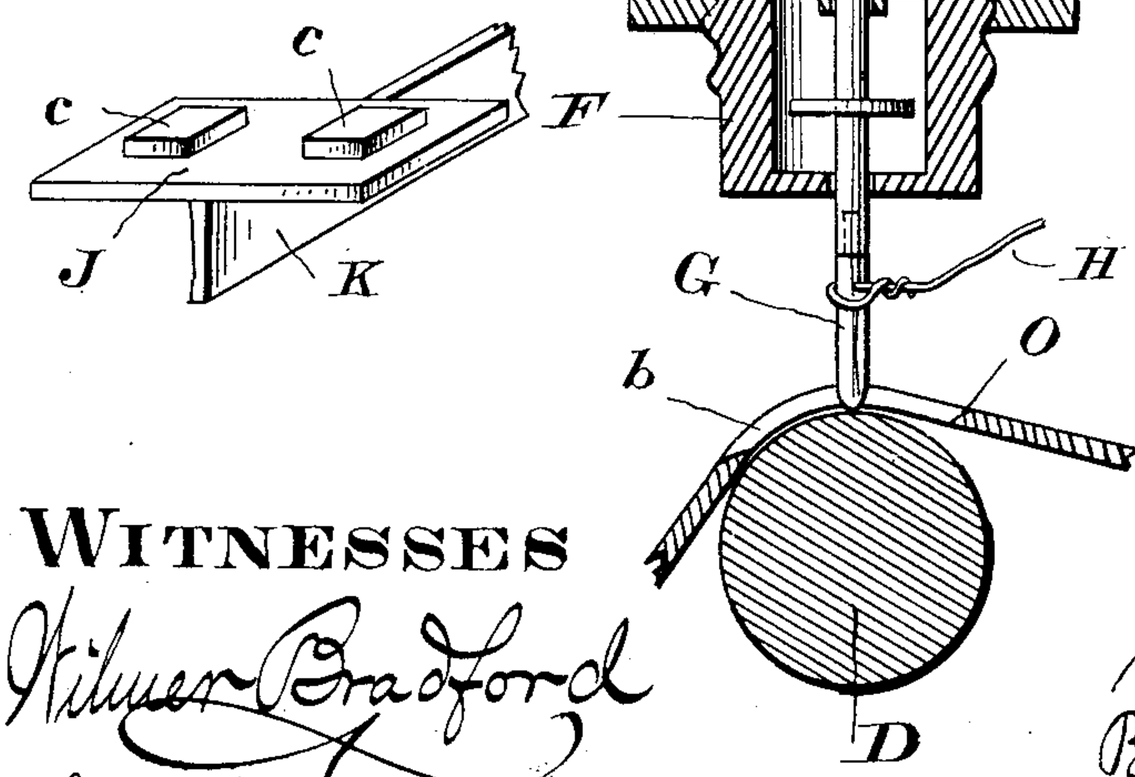


FIG 4

FIG 5



WITNESSES

Wilmer Bradford

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UNITED STATES PATENT OFFICE.

CYRUS N. ANDREWS, OF SAN FRANCISCO, CALIFORNIA.

ELECTRO-MAGNETIC ACTION FOR MUSICAL INSTRUMENTS.

SPECIFICATION forming part of Letters Patent No. 258,871, dated June 6, 1882.

Application filed November 19, 1881. (No model.)

To all whom it may concern:

Be it known that I, CYRUS N. ANDREWS, a citizen of the United States, and residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Automatic Electro-Magnetic Piano and Organ Players, of which the following is a specification.

My invention relates to certain new and useful improvements in automatic piano and organ players, in which the key of a piano-forte or the reed-valve of an organ is operated by the opening and closing of an electro-magnetic current; and the invention consists in the construction and arrangement of devices, as hereinafter more fully set forth.

Figure 1 represents in perspective the general arrangement of the operating mechanism. Fig. 2 shows in plan and also in longitudinal section the slotted music strip or sheet of non-conducting material. Figs. 3, 4, and 5 are detail views.

Similar letters of reference are used to designate like parts throughout the several views.

The battery should be composed of such a number of cells A A as may be found necessary to furnish a galvanic current of the required strength and steadiness, and the various cells should be connected together in the usual manner.

To the positive pole of the battery is attached the conducting-wire B, which is connected to the insulated cylinder D.

To the negative pole of the battery is attached the conducting-wire C, which is connected to one end of the helix I. This helix should be thoroughly insulated and firmly attached to any suitable portion of the instrument to be played or acted upon. Beneath the helix is placed the armature J upon one end of a non-conducting lever arm or beam, K, which lever-arm is pivoted to the standard *a*, which is attached to the instrument at any suitable point beneath the keys or valves. To the opposite end of this lever-arm I attach a cord or rod, L, which is connected to the key or valve of the instrument.

Immediately over the cylinder D is placed the bar E, which may be provided with a means for vertical adjustment. To this bar is attached the downwardly-projecting insulator F, (shown in section in Fig. 4,) which serves as a support and bearing for the platinum rod G, to which is attached the conducting wire H, leading from the helix I.

Slots corresponding in size and position to the notes of the music to be played are cut or punched from a slip of paper or other non-conducting material, as is shown in Fig. 2. The notes for the several keys are arranged in parallel lines, and the length of the slot determines the comparative length or value of the note.

Each and every key or valve of the instrument to be played or acted upon should be connected to a separate platinum rod in the manner hereinbefore described.

Each helix is to be permanently connected to the battery by means of the conducting-wire C, which has as many branches as there are helices.

The operation of my improved automatic electrical piano and organ player will be as follows, to wit: The perforated or slotted sheet O is placed upon a roller, P, and as it is reeled off in an automatic manner upon the roller Q it passes over the cylinder D, which is charged with positive electricity from the battery, and the platinum rods G, which are charged with negative electricity, have free play in a vertical direction within their supporting-insulators F. These rods and insulators are placed at regular distances apart, corresponding with the slots in the sheet O, and when a slot is brought under a platinum point or rod it will by its gravity fall down upon and remain in contact with the cylinder D, thereby closing the circuit, which has the effect of drawing the armature J toward the helix I, and, through the intermediate connecting levers and cords, strike a blow upon the sounding-wire N. The length of the notes will be regulated by the length of the slots *b b* in the strip O, and as it is drawn forward and the end of a slot is reached the platinum rod G will be forced upward, and the non-conducting material of the strip O will be interposed between the lower end of said platinum rod and the cylinder D, the circuit will be broken, and the striking mechanism will resume its original position and be ready to sound another note, when the circuit is again closed by the negatively-

charged pole G falling into a succeeding slot and in contact with the positive pole D.

In order to prevent the clicking sound which would naturally result from the sudden contact of the armature J with the helix I, it will be found necessary to place a couple of small thin pads, *c c*, Fig. 5, of cork or rubber, upon the upper face of the armature, which will serve to deaden the sound without materially affecting the operation of the device.

The battery may be placed in the lower part of the instrument, and the carrying rollers or reels for the slotted music-sheet operated in any well-known manner that will give a regular and even movement to the said sheet or strip.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

The combination, with a key or a valve of an automatic musical instrument, of the battery A A, conducting-wires B C, insulated cylinder D, connected with the positive pole of said battery, helix I, connected with the negative pole of the battery, an armature, J, mounted upon a pivotal support connected with the key or valve to be acted upon, a platinum rod, G, adapted to have a vertical play in its insulator F, a conducting-wire, H, connecting said platinum rod with the helix, and a strip of slotted or perforated non-conducting material, O, adapted to pass between the cylinder D and point or rod G, whereby the circuit is alternately opened and closed, substantially as and for the purpose shown and described.

In testimony that I claim the foregoing I have hereunto set my hand and seal this 7th day of November, 1881.

CYRUS N. ANDREWS. [L. S.]

Witnesses:
C. W. M. SMITH,
CHAS. E. KELLY.