2 Sheets—Sheet 1.

M. J. MATTHEWS.

Mechanical Musical-Instrument.

No. 211,635. Patented Jan. 28, 1879.

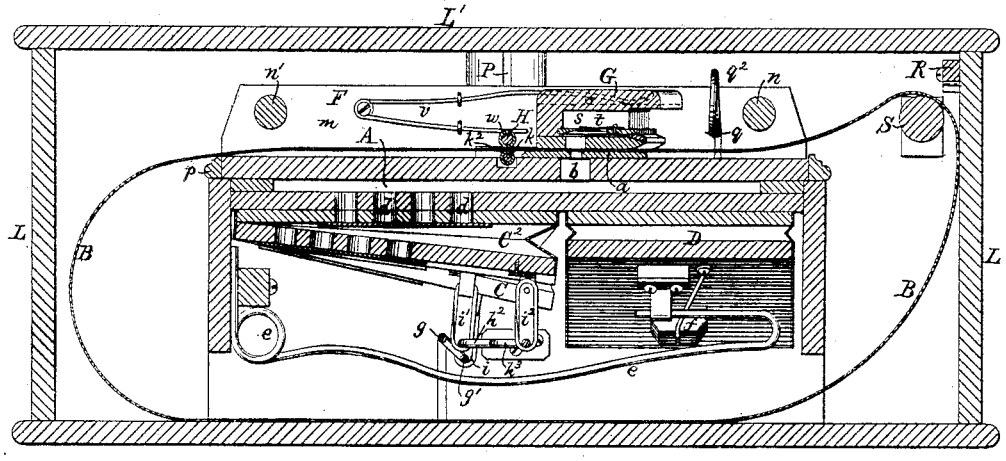

Fig. 2.

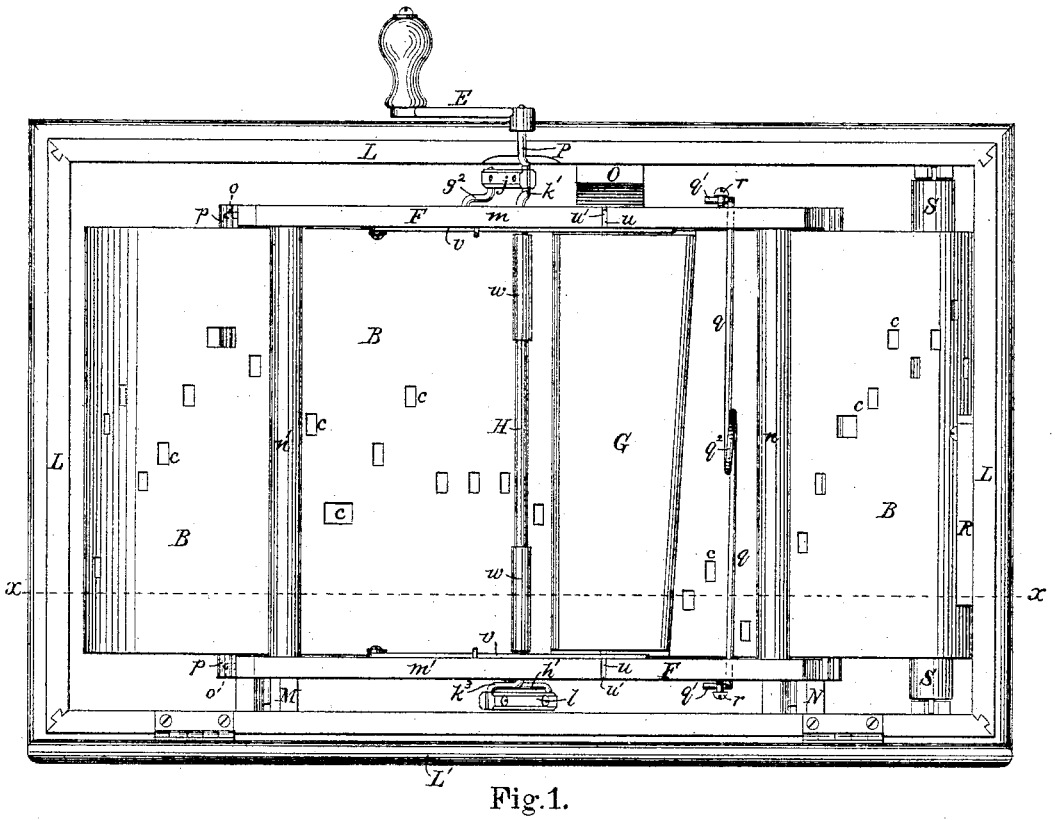

Fig. 1.

WITNESSES:

E. A. Hemmenway.

C. H. Dodd.

INVENTOR:

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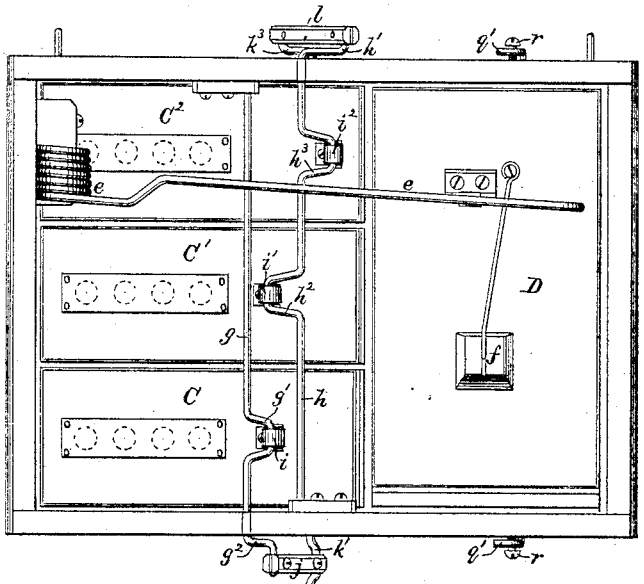

Fig. 4.

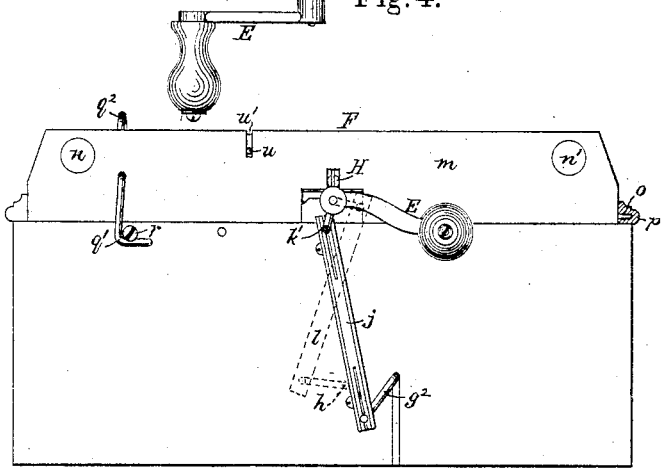

Fig. 3.

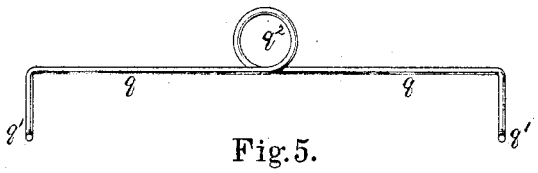

Fig. 5.

WITNESSES:

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UNITED STATES PATENT OFFICE.

MASON J. MATTHEWS, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN MECHANICAL MUSICAL INSTRUMENTS.

Specification forming part of Letters Patent No. **211,635**, dated January 28, 1879; application filed October 2, 1878.

To all whom it may concern:

Be it known that I, MASON J. MATTHEWS, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Mechanical Musical Instruments, of which the following, taken in connection with the accompanying drawings, is a specification:

My invention relates to that class of mechanical musical instruments in which a sheet or band of paper provided with perforations to represent the various notes of a tune is used as a valve to control the operation of the reeds; and it consists, first, in a special arrangement and combination of devices for moving the air through the reeds, whereby a greater volume of tone can be produced in instruments of small size than has heretofore been possible.

It further consists in the combination, with a wind-chest, provided upon its upper side with a series of wind-passages, a feed-roll, having its bearings upon the upper side thereof, suitable wind-moving bellows placed beneath said wind-chest, and an endless band of paper, provided with a series of perforations to represent the various notes of a tune, and adapted to rest upon the upper side of said wind-chest and to pass around said wind-chest and the wind-moving bellows, of a detachable frame, having mounted thereon a secondary feed-roll, and a reed-chamber provided with a series of wind-passages and reeds, and adapted to be pressed upon the perforated paper directly around the wind-passages in the wind-chest when the said frame is secured in position on the wind-chest.

It further consists in a peculiarly-constructed double fastening for securing said detachable frame in position, which will be further described.

It further consists in the combination, with a portable mechanical musical instrument that is mechanically and musically complete in and of itself, of an inclosing-casing, within which the instrument may be entirely hid from view, except the operating-crank, and from which it may be readily and easily removed when it is desired to change the tune, said casing being designed to hide the operating parts of the instrument and render it more ornamental, as it may be ornamented in a great variety of ways, according to the taste of the builder and the desired cost of the instrument.

Figure 1 of the drawings is a plan of an instrument embodying my invention, with the lid of the outer casing turned up edgewise. Fig. 2 is a vertical longitudinal section of the same on line *x x* on Fig. 1. Fig. 3 is a side elevation of the instrument removed from the outer casing. Fig. 4 is an inverted plan, with the outer casing removed; and Fig. 5 is a side elevation of the double fastening-hasp.

A is the wind-chest, provided upon its upper side with the raised platform-like surface *a*, through which is cut a series of wind-passages, *b*, and upon which the sheet or band of paper B rests, the suction of the bellows C, C^1, and C^2 causing said sheet or endless band of paper B to hug closely to said platform-surface, and prevent all passage of air to the bellows except through the perforations *c* in the paper and the wind-passages *b*.

C, C^1, and C^2 are three suction-bellows, arranged side by side immediately beneath the wind-chest A, and each communicating therewith through the passages *d*. D is a reservoir, also arranged directly beneath the wind-chest A, and communicating therewith by suitable passages, said reservoir being kept expanded by the tension of the spring *e*, all in a well-known manner. The reservoir D is also provided with a valve, *f*, having an inwardly-projecting stem, which, in case the reservoir should collapse too far, will strike the upper board of the reservoir and cause said valve to open and admit sufficient air to the interior of the reservoir or vacuum-chamber, and prevent it from becoming permanently collapsed.

The three bellows C, C^1, and C^2 are moved alternately or in succession, one after another, in the following manner: Two rocker-shafts, *g* and *h*, extend across the instrument from front to rear, some distance below the bellows, and each have bearings in the frame of the instrument, as shown in Fig. 4.

The rocker-shaft *g* has formed in it the crank g^1, to which is coupled one end of a connecting-rod, *i*, the other end of which is hinged or otherwise connected to the under side of the bellows C; and the front end of said rocker-shaft has formed thereon the crank g^2, con-

nected by the rod or link j to the crank k^1, formed in the shaft of the driving feed-roll k, mounted in suitable bearings in the upper side of the wind-chest A, and provided at its extreme front end with the operating-crank E, as shown.

The roll k has a portion of its length covered with a rubber tube or tubes, k^2, and has formed upon its rear end the crank k^3, from which the connecting rod or link l (shown in full in Figs. 1 and 4, and in dotted lines in Fig. 3) leads to and is coupled to the crank h^1, formed on the rear end of the rocker-shaft h, all so arranged that a revolution of the driving-shaft k will cause an oscillating or rocking motion to be imparted to the shafts g and h in an obvious manner. The shaft h also has formed therein two cranks, h^2 and h^3, projecting from opposite sides of said shaft, as shown in Fig. 4.

The crank h^2 is coupled to one end of the link i', the other end of which is hinged or otherwise connected to the under side of the bellows C^1. The crank h^3 is, in like manner, connected, by means of the link i^2, to the bellows C^2.

F is a detachable frame, made up of the side rails, m m', and the two tie-rods n and n', and secured in position upon the upper side of the wind-chest by means of the pins o o, set in one end of the side rails, m and m', and adapted to engage with sockets formed in the molding p for the purpose, and the rocker-shaft q, provided at each end with a hook or hasp, q^1, each adapted to engage with a pin, r, set in the side of the frame of the instrument, as shown in Fig. 3, said rocker-shaft q, the two hook-fasteners q^1 and a lever, q^2, for operating the fasteners, being made from a single piece of wire, as shown in Fig. 5.

G is the reed-board, having formed therein a series of chambers, s, in each of which is set a metallic reed, t, in any well-known manner.

The reed-board G is provided at each end with a trunnion-pin, u, which rests in a slot, w', formed in the upper edge of each of the rails m and m' of the frame F, the spring v resting upon said trunnion-pin u, and by its tension pressing the reed-box G hard upon the paper B, as shown.

H is a second feed-roll, having its bearings in the side rails, m m', of the frame F, in a position to engage with the driving-roll k when the frame F is placed in position, and be rotated by frictional contact therewith, and thus feed the sheet or endless band of paper B along, drawing it between the reed-box and the upper surface of the platform a, and bringing the different perforations formed therein successively into position to permit the passage of wind through the reeds to the bellows, and thus cause the various notes to be sounded. The roll H has a portion of its length covered with rubber tubes w w, as shown in Fig. 1.

The perforated paper B, I prefer to use in the form of an endless band, which passes around under the bellows, as shown in Fig. 2; but a sheet or strip of paper not connected together at its ends to form an endless band may be used, if desired.

The instrument, constructed as hereinbefore described, is complete in and of itself so far as the mechanical operation of the instrument is concerned, or the musical tones produced thereby, and I propose to manufacture a cheap instrument substantially as herein described; but in order to meet the requirements of those who wish for something more ornamental and are willing to pay a higher price, I provide an ornamental inclosing-casing, L, provided with a hinged lid, L', and suitable chocks M, N, and O, to hold the instrument in a fixed position in said casing, the front of said casing being also provided with a slot, P, to receive the driving-shaft k, all so arranged that when the instrument is placed in position in the casing the crank E is outside of said casing and the instrument may be operated therein, and need never be removed from said casing, except for repairs or when it may be desired to change the tune, when it may be readily lifted from the casing without removing screws or other fastenings.

R is a prop for holding up the lid L'; and S is a roll, over which the band of paper is carried when the tune is a long one, in order to take up some of the slack.

I have shown but three wind-moving bellows; but it is obvious that, if desired, a fourth bellows may be added and operated from the rocker-shaft g, by forming in said rocker-shaft another crank, projecting therefrom upon the side opposite to the crank g^1, so that the shaft g shall operate two bellows precisely in the same manner that the shaft h operates the two bellows C^1 and C^2, the cranks k^1 and k^3 on the driving-shaft k being placed at the proper angle to each other to open and close said bellows in succession, or so that no two of said bellows shall be fully closed or open at the same time.

I do not claim, broadly, in this application the removable frame F, as substantially the same device is shown, described, and claimed in a prior application filed by me August 19, 1878, and now pending before the Patent Office; but

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The combination of three or more wind-moving bellows, arranged side by side, two rocker-shafts, g and h, each provided with two or more cranks, as set forth, two connecting-rods, j l, driving-shaft k, provided with cranks E, k^1, and k^3, and a connecting rod or link, connecting the bottom board of each of said bellows with one of the cranks of said rocker-shafts, all arranged and adapted to operate substantially as and for the purposes described.

2. In combination with a wind-chest provided upon its upper side with a series of wind-passages, communicating therewith, a driving-shaft or feed-roll mounted upon the upper side

of said wind-chest, suitable wind-moving bellows placed beneath said wind-chest, and an endless band of perforated paper passing around said wind-chest and wind-moving bellows, as set forth, the detachable frame F, the secondary feed-roll H, having its bearings on said frame, the reed-board G, provided with trunnion-pins *u u*, fitted to and resting in the slots *w'* in the side rails of the frame F, and the springs *v v*, all arranged and adapted to operate substantially as and for the purposes described.

3. In a mechanical musical instrument, the rocker-shaft *q*, provided at each end with a hook-hasp, q^1, and at or near the middle of its length with the operating lever or handle q^2, all formed from a single piece of wire, substantially as described.

4. In combination with a portable mechanical musical instrument that is mechanically and musically complete in and of itself, an independent inclosing-casing provided with a hinged lid, a slot for the passage of the crank-shaft, and suitable chocks secured therein to hold the instrument in position, all arranged and adapted to operate as herein set forth, so that the instrument may be readily lifted from said casing without removing fastenings of any kind.

Executed at Boston this 25th day of September, 1878.

MASON J. MATTHEWS.

Witnesses:
JOSEPH D. MATTHEWS,
N. C. LOMBARD.