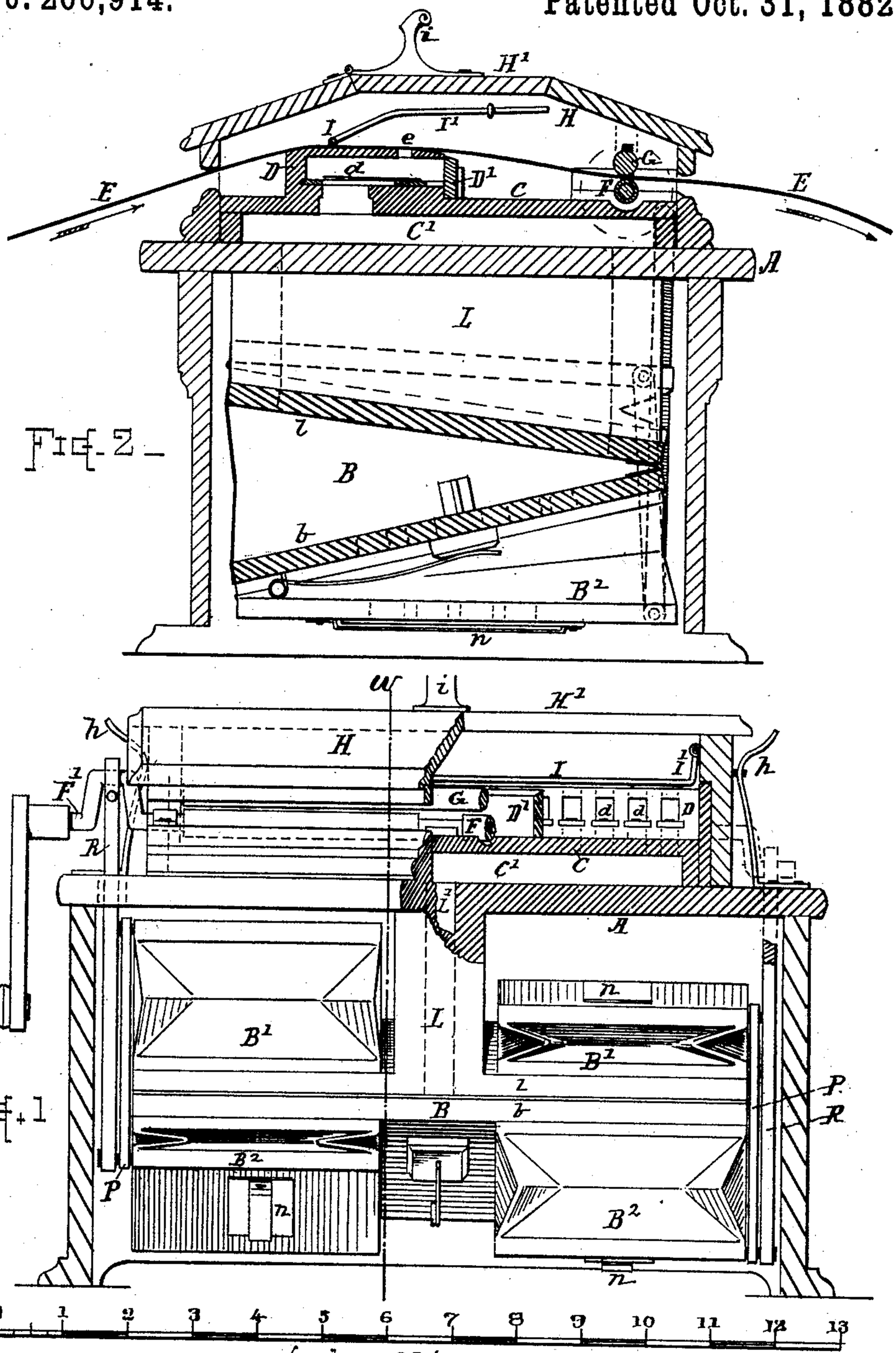
(No Model.) 3 Sheets—Sheet 1.

F. STONE.

MECHANICAL MUSICAL INSTRUMENT.

No. 266,914. Patented Oct. 31, 1882.



Witnesses—
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Inventor—
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(No Model.) 3 Sheets—Sheet 2.

F. STONE.

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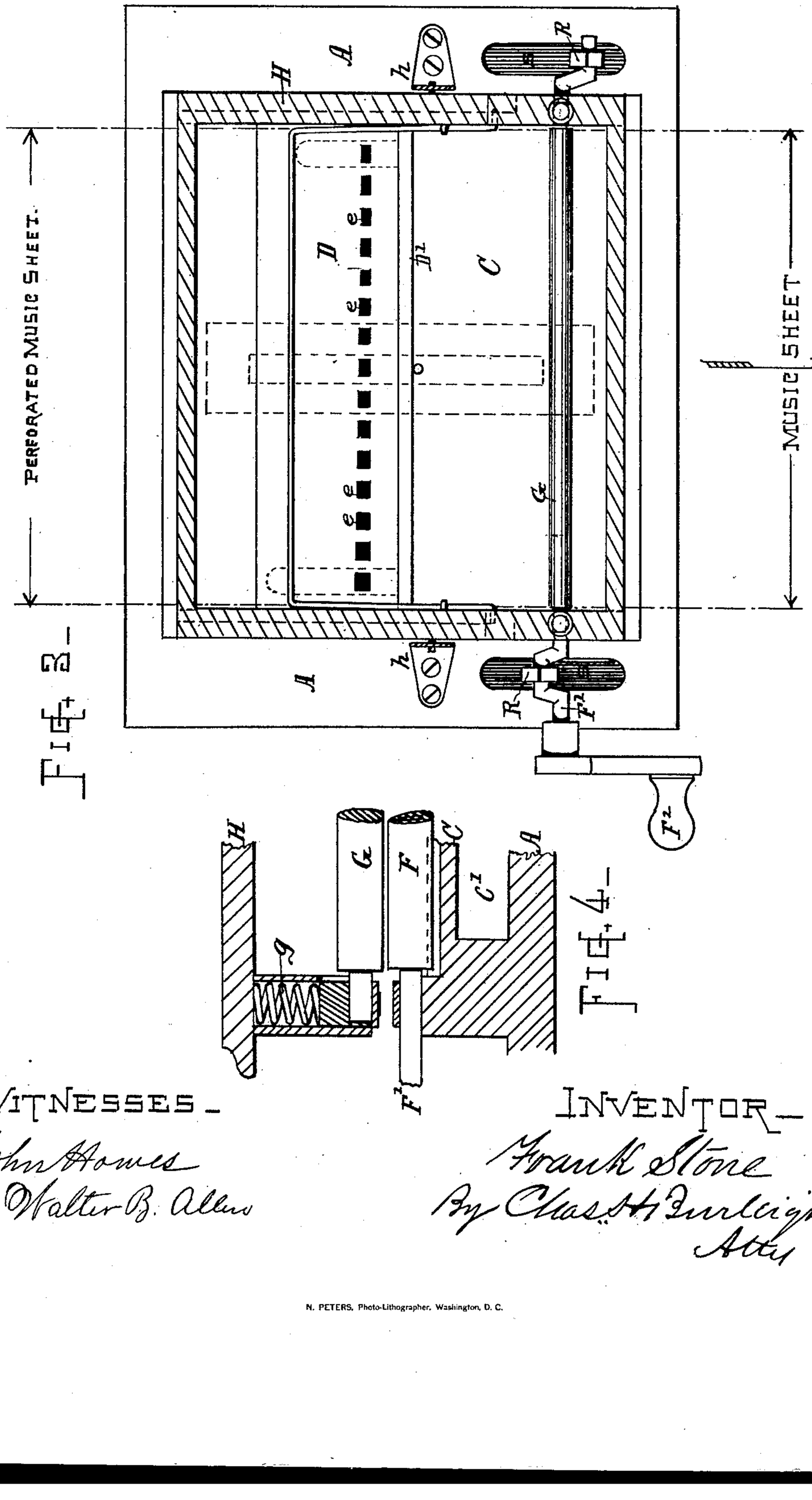

FIG. 3.

FIG. 4.

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(No Model.) 3 Sheets—Sheet 3.

F. STONE.

MECHANICAL MUSICAL INSTRUMENT.

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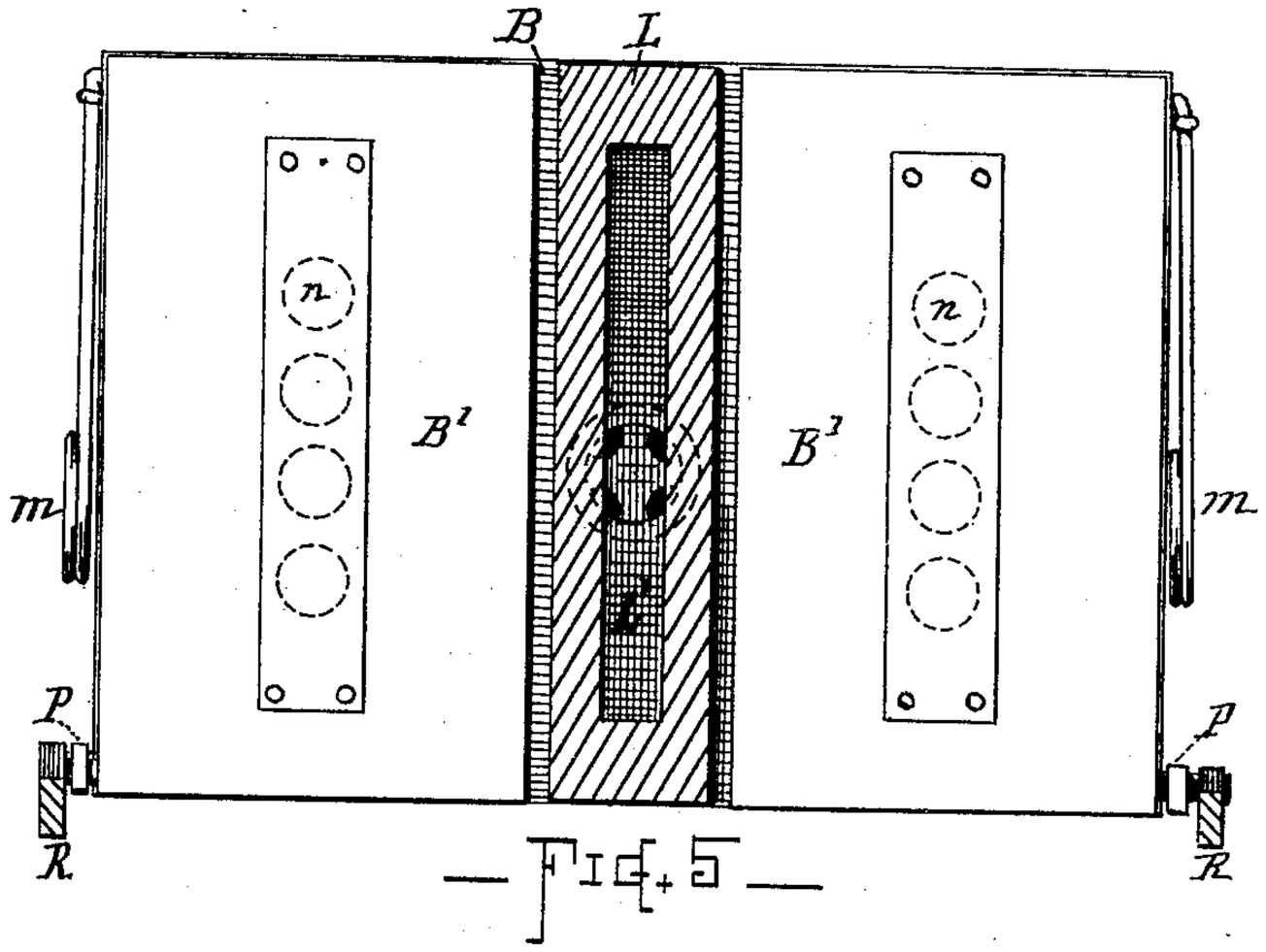

FIG. 5.

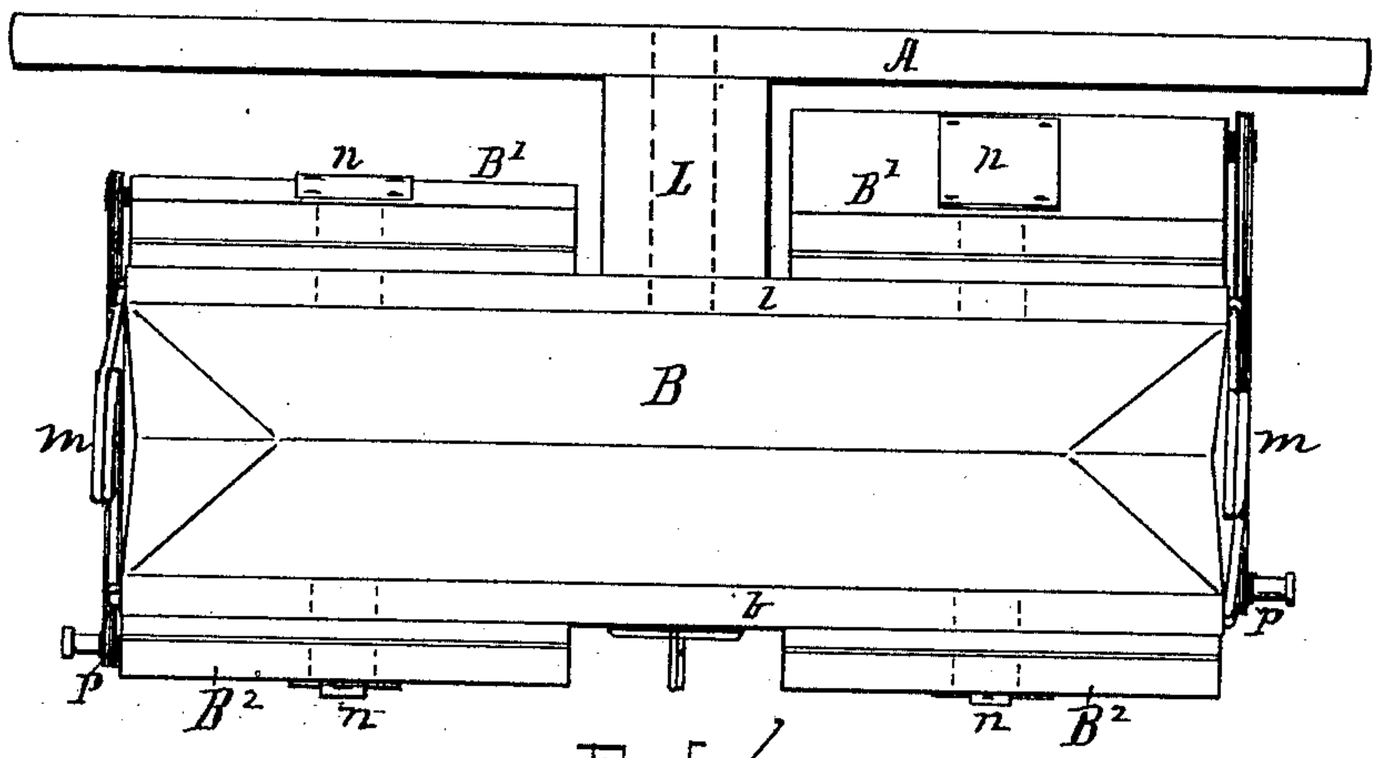

FIG. 6.

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UNITED STATES PATENT OFFICE.

FRANK STONE, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO THE MUNROE ORGAN REED COMPANY, OF SAME PLACE.

MECHANICAL MUSICAL INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 266,914, dated October 31, 1882.

Application filed January 16, 1882. (No model.)

To all whom it may concern:

Be it known that I, FRANK STONE, of Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Mechanical Musical Instruments; and I declare the following to be a description of my said invention sufficiently full, clear, and exact to enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

The objects of my present invention are, first, the adaptation and arrangement of the reed-board and sounding devices in their relation to the wind-chamber and perforated valve-sheet or traveling music-sheet in such manner as will give fullness and strength of tone, quickness of action to the several notes, and so as to permit ready access to the reeds when required; also, to facilitate economy in manufacture, and to afford a compact and convenient arrangement of the several parts, whereby a neat, desirable, and efficient instrument can be afforded at comparatively slight cost. These objects I attain by mechanism the parts of which are constructed and combined in the peculiar manner shown in the drawings and hereinafter described.

Figure 1 is a view of a mechanical musical instrument constructed in accordance with my invention, the view being shown with the front of the case removed and the upper right-hand corner in section to reveal the various parts of internal construction. Fig. 2 is a vertical section at the position of line *w w*, Fig. 1. Fig. 3 is a plan view of the instrument with the top covering removed to reveal parts beneath. Fig. 4 is a vertical sectional view, showing the journal-bearing of the feed-rolls. Fig. 5 is a plan view of the blowing apparatus, and Fig. 6 is a rear view of the same.

In reference to the drawings, A denotes the bed-piece or table to which the action is attached. It is made to rest upon the upright sides A′, which together form the rectangular case within which the bellows B is located, the case being only of such size as will conveniently contain the bellows mechanism.

C denotes the sound-board, arranged above the bed-piece A, parallel therewith, and at such distance therefrom as will give the proper wind-chamber C′, the two parts being secured together by suitable bars or flanges, which tightly close the sides of the chamber C′, as illustrated.

D denotes the tube-board, which I arrange in relation to the air-exhausting devices and traveling perforated music-sheet E in the peculiar manner shown—that is, with its reed-cells and reeds *d* in horizontal position, parallel with the top of the instrument, the under side of said tube-board resting flat down upon the top of the sounding-board, to which it is solidly secured, occupying a position between the exhaust-air chamber C′ and the music-sheet E, which travels across the top surface of the tube-board in contact therewith, and acts directly as a valve for the air-ducts or inlet-openings *e*, which are formed through the roof of the cells in the manner indicated, the series extending in a straight line from end to end of the set, and the size of the openings being graduated as required to admit proper quantity of air. The mouths of the cells at which the reeds *d* are inserted are arranged toward the front, and are closed by a removable bar or gate-piece, D′, so that convenient access to the reeds is attained without interfering with the air-openings *e*.

The arrangement of the parts in relation to the music-sheet and blowing devices makes a compact sounding action, gives superior speaking-power to the reeds, permits gradation of the openings *e* to proportion the air-currents to the requirements of the respective reeds, and allows of the reeds being conveniently taken out or adjusted by simply raising the bar D′ and using the reed-hook in the usual manner.

The construction of the tube-board and air-inlets *e* in the roof of the cells, and their location between the valve-sheet and exhausting apparatus, as shown, are features of my invention.

F indicates the feed-roll, and G the presser-roll, by which the perforated music-sheet E is drawn forward through the instrument. The shaft F′ of said feed-roll is provided with a hand-crank, F^2, and also with suitable cranks for operating the blowing devices.

H indicates a removable top piece or cover,

arranged over the action mechanism, and retained upon the bed-piece A by spring-catches *h*, located at the sides. Suitable spaces are left between the cap H and lower portions of the case at front and rear for the free passage of the music-sheet.

The journal-bearings of the presser-roll G are supported in the cap-piece H, said bearings being arranged to give a yielding pressure by the action of springs *g*, located in recesses above the bearings, as illustrated in Fig. 4.

I indicates a wire rod or bar provided with spring portions I′ at its ends, which are fixed to the sides of the casing or cap-piece H. Said bar I is arranged across the top of the tube-board or music-race, where it presses upon the top of the perforated sheet E and serves as a frictional brake for keeping it drawn taut, and also for holding it closely down upon the air-inlet openings *e*.

The entire cap-piece H, with the presser-roll G and bar I, can be removed, when desired, by releasing the catches *h*, and when thus removed the full top of the action is exposed, so that the music-sheet can be laid over the tube-board and feed-roll F. The cap H then being replaced, the instrument is ready for operation. At the central part of the cap is a hinged lid or movable section, H′, provided with a suitable thumb-piece, *i*, by which it can be conveniently raised and depressed to serve as a swell or expression valve when playing the instrument.

The pressure-bar I, formed as shown, and the arrangement thereof in relation to the tube-board and case, are features of my invention.

The blowing or wind apparatus I arrange in the peculiar form and manner illustrated in Figs. 1, 2, 5, and 6. The main reservoir B is attached to the under side of the bed or table A by a hollow hanger or standard, L, which serves both as a support for the bellows and as an air-conductor, a passage, L′, being carried through it from the wind-chest C′ to the interior of the bellows-reservoir B. The top board, *l*, of the reservoir is rigidly fixed to the support L, while the bottom board is hinged to the former along its front edge, so as to permit downward expansion of the reservoir by the action of the springs *m*. Exhausters B′ B′ are arranged upon the top of the reservoir B at the right and left of the standard of conductor L, said exhausters B′ occupying the whole space, or nearly so, on the top board, *l*, while corresponding exhausters, B^2 B^2, are arranged on the under side of the reservoir B in the manner illustrated. The hinging of the exhausters B′ and B^2 is located at the opposite side from the hinging of reservoir B, so that the bellows, when expanded, are of a comparatively square form and utilize the entire space within the case A′, as shown. The exhausters B′ and B^2 are fitted with the usual air-valves, *n*, and the upper and lower exhausters are coupled together for uniform action by pitman-bars P, pivoted to their outer corners, while other pitman-bars, R, connect said exhausters with the cranks of the operating-shaft F′, by means of which the bellows mechanism is actuated. Said rods R pass up through suitable slots, *s*, in the bed-piece A, as illustrated. The form and arrangement of the bellows are features of my invention.

It will be observed that the construction herein illustrated is very simple, convenient, and compact, while an instrument is produced having great strength and power of tone, and which can be furnished at a comparatively small price.

I am aware that tube-boards having horizontally-arranged reeds have heretofore been employed; but so far as I am aware such tube-boards have been differently constructed from that herein described, and have been arranged above the paper or music sheet, or else have been operated by intermediately-arranged valves, or have been elevated from the sounding-board and operated by force-bellows—circumstances which require different conditions to promote satisfactory results, and requiring greater complication of mechanism than does my present arrangement—and I do not herein make claim to such constructions; neither do I desire to herein claim broadly a bellows apparatus having double sets of exhausters, except in the construction and arrangement shown and described.

What I claim as of my invention, and desire to secure by Letters Patent, is—

1. In a mechanical musical instrument, the combination, as shown and described, of the sounding-board C, having chamber C′ beneath it, the tube-board D, permanently fixed upon the top of said sound-board and provided with the horizontally-arranged reeds *d*, and air-passages *e*, formed through the roof of the reed-cells, with the gate-piece D′, closing the mouths of said cells, the music-sheet E, working across and in contact with the top of said tube-board and acting directly as a valve to the passages *e*, and the bellows apparatus consisting of the horizontal reservoir B, with exhausters B B and B′ B′, located, as shown, with the hollow vertical standard L, connecting the central part of said reservoir with the wind-chamber C′ for exhausting air therefrom, said parts being located, constructed, and operated as hereinbefore set forth.

2. The combination, with the tube-board D and removable cap-piece H, of the presser I, consisting of a wire having its ends bent to form spring portions I′, which are secured to said cap-piece, and with its central portion extending transversely across the top surface of the tube-board for pressing upon the music-sheet at the position and in the manner as shown and described.

3. In combination, as shown and described, the action bed or table A, with the sounding-

board C, tube-board D, bellows apparatus, and feed devices, all constructed and arranged in the manner illustrated, and adapted to fit the case A′, as described, and the cap-piece H, having the inclined top with central hinged portion, H′, provided with thumb-piece *i*, fitted to cover the sounding devices, and removably connected to said table by the side catches, *h*, said parts being formed and arranged as herein set forth.

Witness my hand this 3d day of January, A. D. 1882.

FRANK STONE.

Witnesses:

CHAS. H. BURLEIGH,

JOHN HOWES.