

M. J. MATTHEWS.

Reed-Organs.

No. 148,482.

Patented March 10, 1874.

Fig: 1.

Fig: 3.

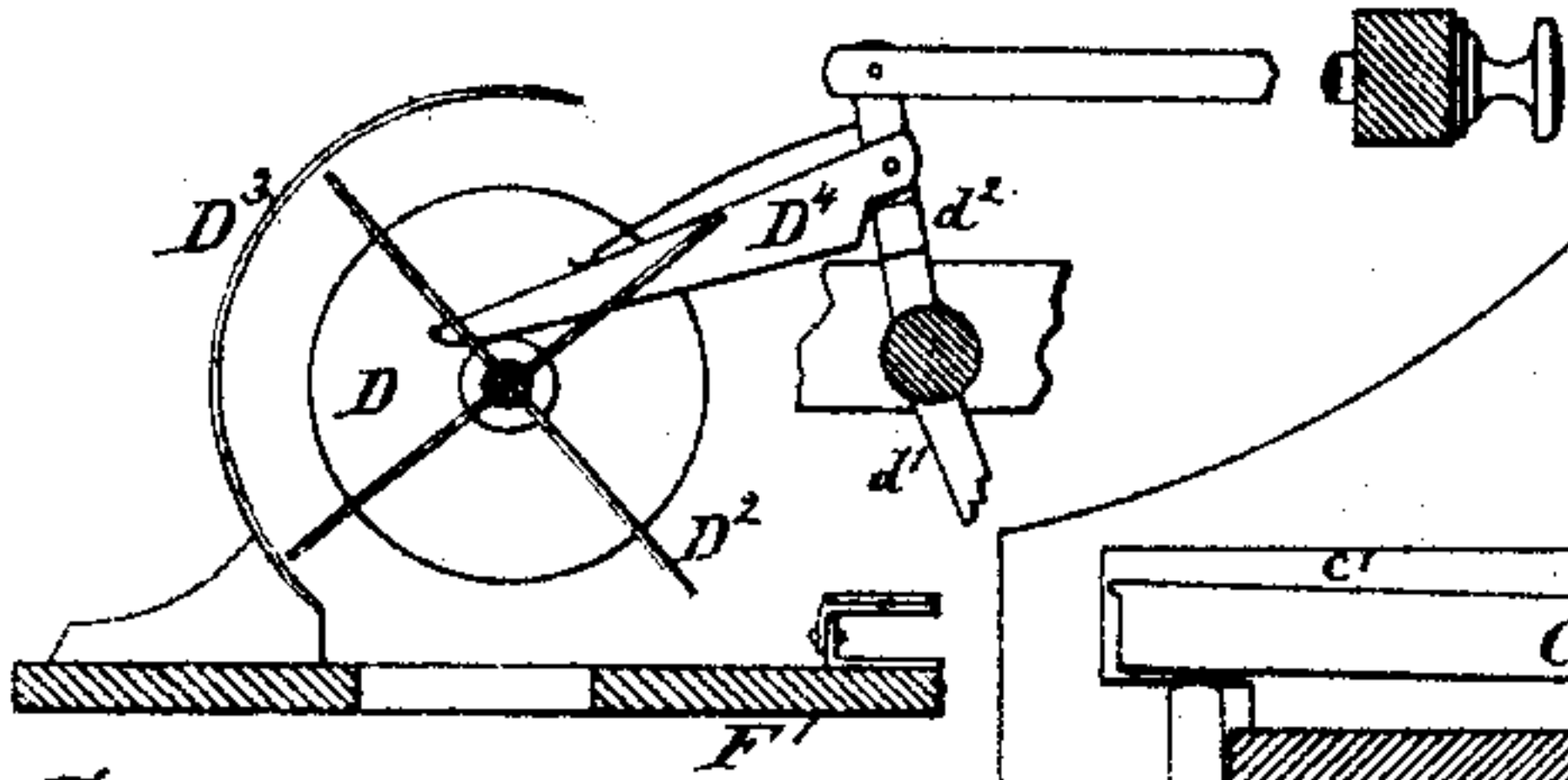


Fig: 4.

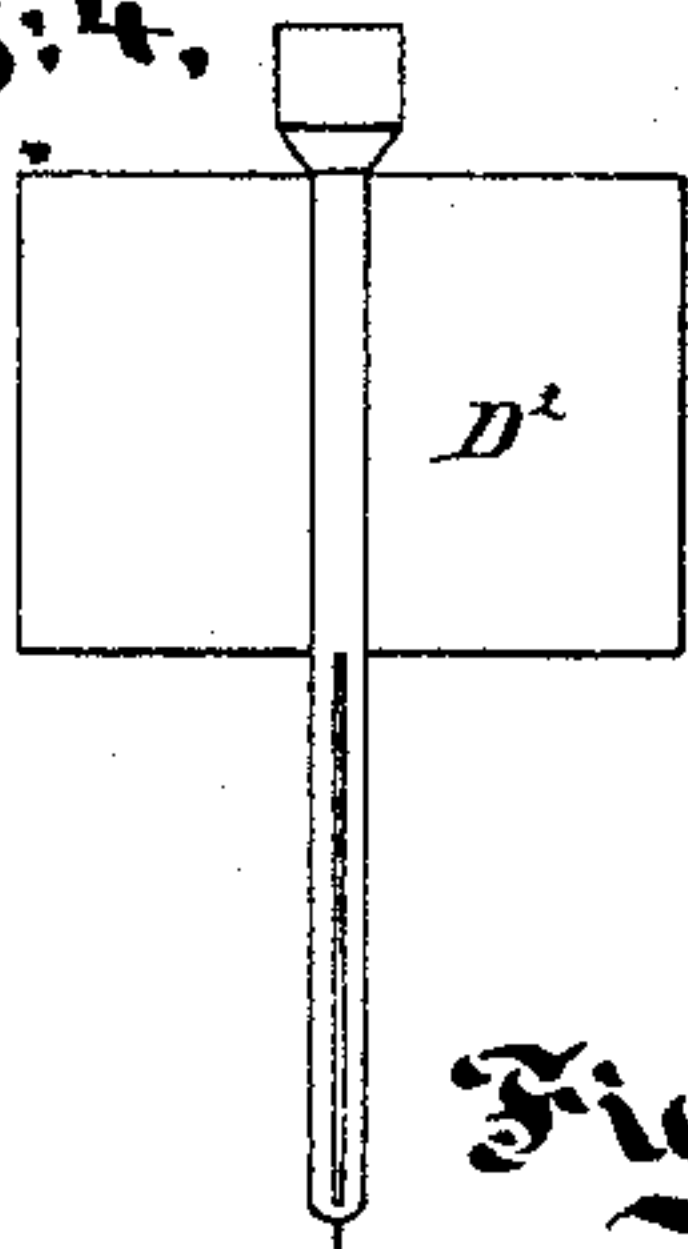


Fig: 2.

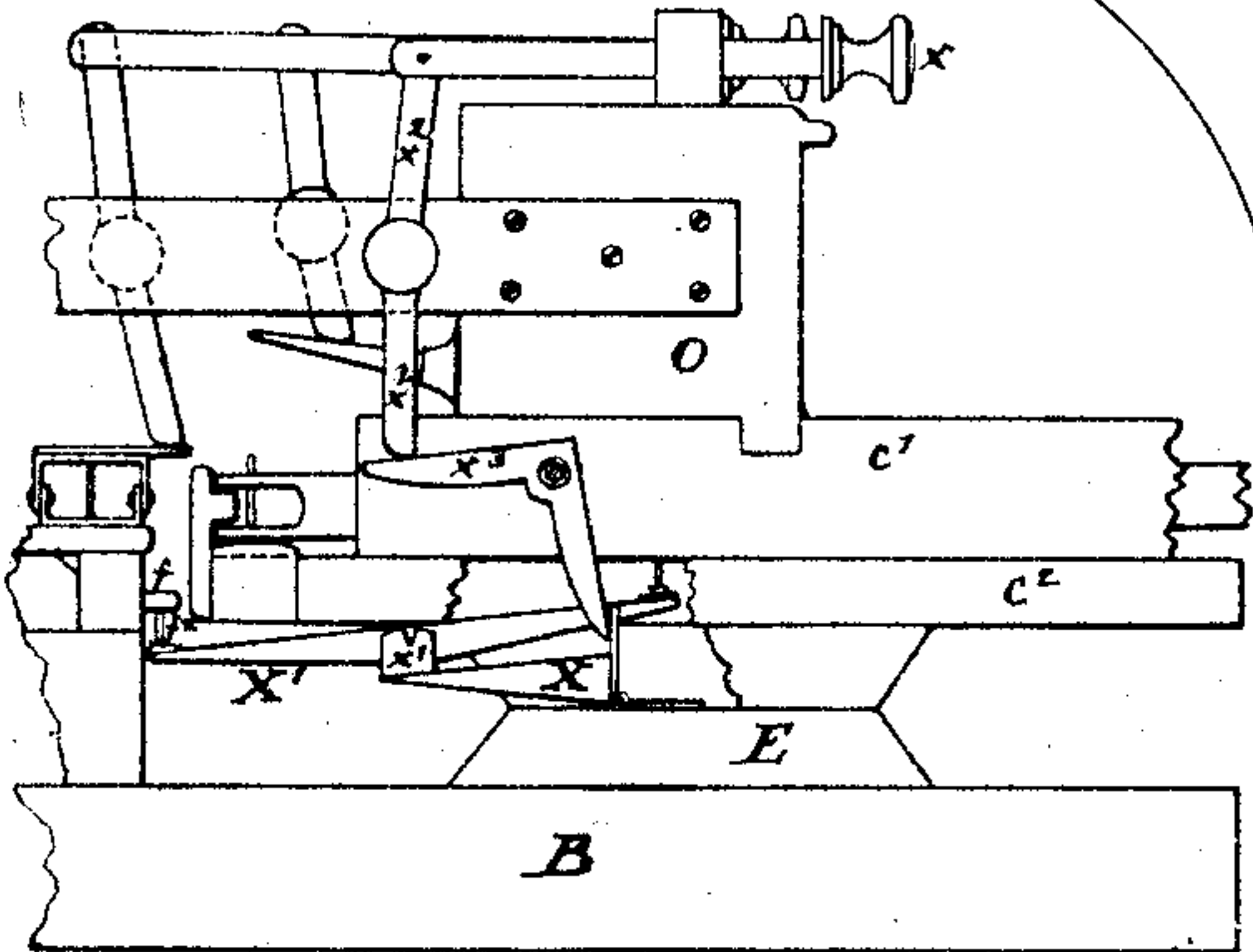
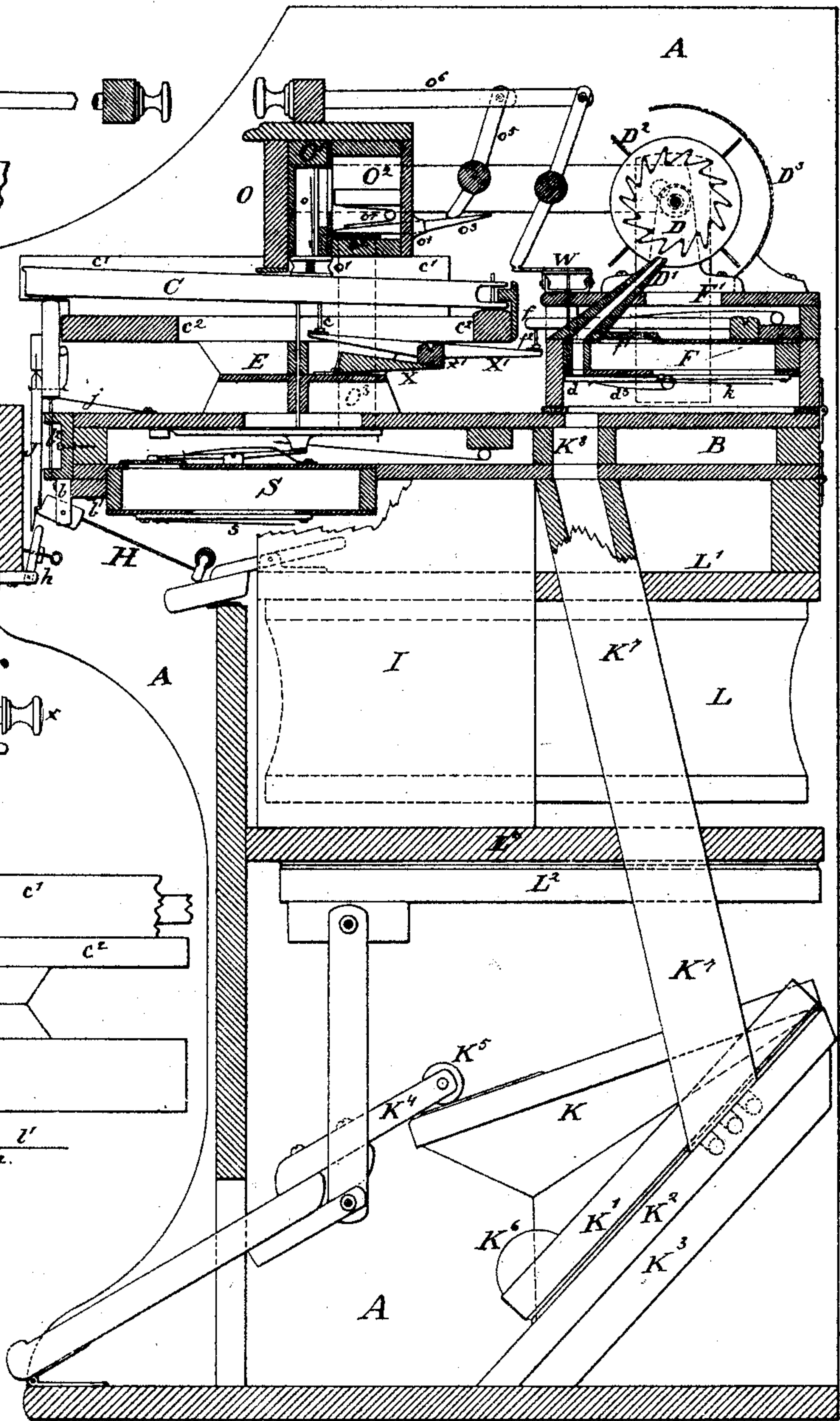
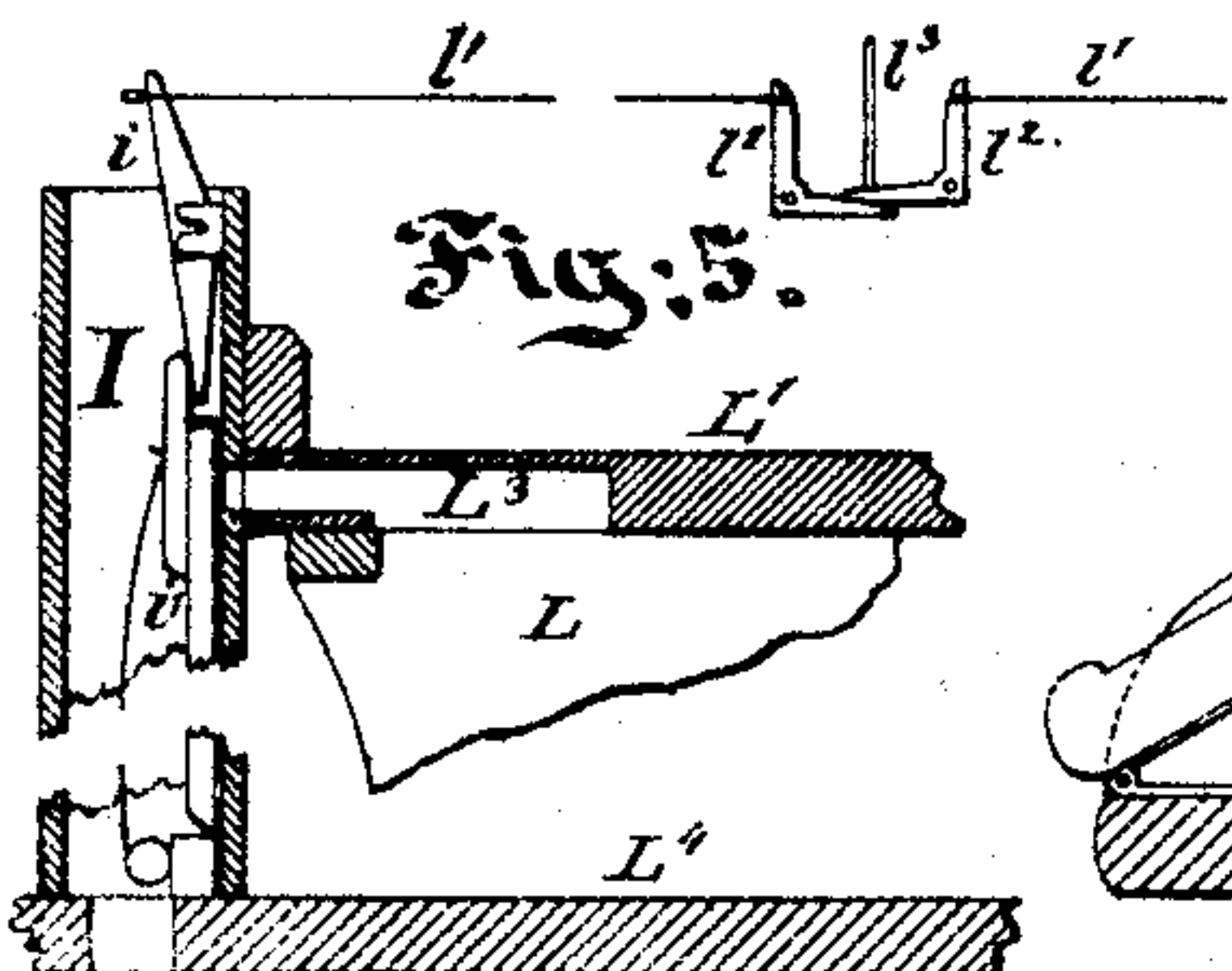


Fig: 5.



Witnesses:

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MASON J. MATTHEWS, OF NEW YORK, N. Y.

IMPROVEMENT IN REED-ORGANS.

Specification forming part of Letters Patent No. 148,482, dated March 10, 1874; application filed June 5, 1873.

To all whom it may concern:

Be it known that I, MASON J. MATTHEWS, of New York city, in the State of New York, have invented certain new and useful Improvements in Reed-Organs, of which the following is a specification:

The objects of my invention are, first, to make such additions as will produce in one and the same instrument the characteristic effects of the harmonium and American reed-organ; second, to produce more telling, emotional, and string-like effects than are obtainable in existing instruments; third, to proportion the weight of the touch to the number of sets of reeds in play, (when much power is obtained from an instrument, heavy touch seems natural, but the reverse is the case when soft music is being produced;) fourth, to provide a simple arrangement for the application of the stop usually termed "percussion;" fifth, to make such wind connections as will leave available, for desirable purposes, a most important part of the instrument, besides admitting of a simple application of the well-known expression-stop to a suction instrument; sixth, to so operate the fan connected with the vox-humana stop that it will revolve at a desirable and uniform speed; seventh, to so arrange the several parts that they will be of easy access for adjustment or repair.

The following is a description of what I consider the best means of carrying out the invention. The accompanying drawings form a part of this specification:

Figure 1 is a vertical cross-section through the entire instrument. The section is not in one continuous plane. The lower and middle portion is nearer the eye than the upper portion; so also the section of the nozzle through which air is blown upon the motor-wheel of the vox-humana is nearer the eye than the work on each side of it. The drawing is intended to represent the novelties clearly with but a small number of figures. Fig. 2 represents some of the parts in upper portion as seen from the opposite side. In this figure the coupler-stop is represented as drawn out, so as to cause the vox-humana reeds to sound with the others. Fig. 3 represents certain parts as seen from the same side as Fig. 2. This shows provisions to aid in starting and

stopping the vox-humana fan. Fig. 4 represents my vox-humana fan detached. Fig. 5 is a longitudinal section through certain portions. It shows the arrangement of the expression valve and adjacent parts.

Similar letters of reference indicate like parts in all the figures.

A is the fixed frame-work. At each side of my instrument is a single trunk or passage, I, at the foot of which are openings into the exhausts L². (a trunk at one side would do, if large enough.) On the lower side of the support-board L⁴, and below each trunk, is a small leather valve, to prevent the return of air into the wind-chest B. Within the thickness of the support-board L¹, to which the suction-reservoir L is attached, are formed channels L³, which communicate with the trunks I through their sides, as shown in Fig. 5. These channels or openings L³ are controlled by expression-valves v¹. These valves are opened or closed through the medium of levers i, connecting-rods l¹ l², bracket-levers l² l², push-pin l³, and a suitable stop-draw. The wind-chest B is hinged at the back, and closes on the top of the trunks I. Openings are made through the lower board of this wind-chest communicating with the trunks. To the under side of the wind-chest B a modification of the harmonium reed-pan S is attached. It is leathered around its edges, and hinged at the back, so that it will rise and fall for coupling and swell purposes without causing leak. The naked reeds s are screwed to the under surface of this pan S. The percussion or hammer-action, which in this instrument strikes the reeds s, will be described in another patent specification, except in the following particulars: In this case the regulator h is attached to the lock-board of the instrument. The hammer hinge-piece b is screwed or otherwise fastened to a block, b¹, and does not form a part of the guide-piece b². The hopper J is sprung upward from the upper surface of the wind-chest B by a spring, j. The upper reed-chest O above the key-board, as here shown, is peculiar, from the fact that the reeds o therein are placed in a vertical position instead of horizontally. My self-adjusting spring-pallet o¹, which is attached to the keys C, acts on the mouths of the tubes at the heel of the reeds, which are flush therewith.

It would not be difficult to make the pallet open on the front side of the tube-board and in sight of the player, but the former plan is preferable. The tube-board O^1 is glued to the wind-chest O^2 . Air communication between this chest and the wind-chest B is made by an opening, O^3 , provided through the key-block c^1 , key-frame c^2 , and end of the tube-board E, (see dotted lines in Fig. 1.) An opening at each end will be necessary when base and treble are desired. A trunk might be used instead of air-passages, as described, but it would take up the room necessary for part of my stop work. This wind-passage is controlled by a valve, o^2 , which covers the opening described. The lever o^3 attached to this valve o^2 projects through the back of the wind-chest O^2 , and through a packing or nipple of leather, o^4 , which is glued to both to prevent leakage. The opening and closing of the valve o^2 is determined by lever o^5 , stop-draw o^6 , and spring o^7 inside the wind-chest O^2 . The tube-board E, key-frame c^2 , and keys C are of ordinary construction, excepting the hole through the end, as explained.

The following describes the pressure part of my instrument: The bellows are located toward the bottom and back of the case. K is the feeder. K^1 is the reservoir. K^2 is the support-board; K^3 , blocks secured to the inside of the case. The feeder K is held open by a spring. The spring may be within the feeder, (half a spring would do,) or it may be outside of it, in which case the ordinary organ-bellows spring may be used. The piece K^4 , with pulley K^5 , is attached to a foot-pedal. There are three of these foot-pedals, two for suction, and one for pressure. The pressure-pedal, on being depressed, forces the air up through suitable channels formed in the support-board K^2 , the trunk K^7 , and block K^8 , to the pressure-pan F, and down through a similar block, and trunk, and passages at the opposite end of the instrument, to the reservoir K^1 , and inflates it. The gravity of an attached leaden or other weight, K^6 , together with the weight of the board to which it is fastened, forces the air back to the reed-pan F, so that a constant and steady supply is insured.

The reeds in all harmonium-pans are screwed on and are inside of the pans. The pallets are always outside. Of these pallets there are sixty-one, or a number according to the compass of the instrument; but I will describe only one, it being understood that the others are the same.

In my instrument the lever f , to which the pallet f^1 is attached, reaches over the front of the pan. The parts nearer the front of the instrument, marked $X X' x^1 x^2 x^3$, form a coupler for the pressure-pan F. The piece X, extending through the compass of the keys, is hinged at the edge nearest the front of the instrument, on the upper face of the tube-board E. The lever X' is centered with a pin, and lies in the grooved piece x^1 . When the hinged

piece X is raised by drawing the stop x (see Fig. 2) the coupling is effected. The front end of the lever X' is brought in contact with the screw c in the key C, and the back end in contact with the screw f^2 in the lever f , so that when the key is depressed the front end of the lever f , with the pallet f^1 attached, is caused to rise and (if the wind is supplied) the corresponding reed to speak. When the stop is pushed in, the upper end of the bracket-lever x^3 rises and permits the coupling action to fall by its own weight. It would be easy to control the speaking of the back set of reeds by an air-valve, but in that case the main wind-chest would have to be partitioned off. This would be objectionable, in that it would rob the ordinary reeds of the necessary resonance. The tension, also, of the back set of springs, would always be felt in the touch. With the coupling this tension is only felt when the reeds k are in play. Over the reed-pan F is placed, and properly fastened, a sound-board or reflector-board, F' , with an opening therein, on which, in proper bearings and connections, is mounted my modification of the vox humana or fan-tremolo.

A twofold object is attained in thus mounting the fan-tremolo: First, the tone of the pressure-reed is blown outward upon the fan, and is more sensibly affected than it would be if drawn away from it, as in an ordinary suction instrument; second, steady and uniform revolutions result from this application of a wind apparatus separate and distinct from the main bellows of the instrument.

In my instrument is employed an uninclosed motor. It is formed of two disks of wood or other material, light and thin. These disks are held apart about one inch, more or less, by pegs of wood or wire, arranged at proper intervals in two circles. A strip of paper or other light substance is woven about these pegs, over the outer and under the inner pegs, so that a section shows as in Fig. 1. The air which drives the motor D passes from the reed-pan F through the conductor D^1 . It is controlled by the valve d inside the reed-pan. A pin extends from the under side of the platform W to this valve d , which, when depressed by the stop action, opens it. When the pin and stops are in their normal positions the valve is closed by a spring, d^3 . Thus the fan D^2 and reeds k can be used separately or together, at pleasure. This is important, as the upper set of reeds on the suction part of the instrument is also affected by the fan.

Fig. 4 shows how the fan is constructed. The blades are in separate lengths, each length only half the length of the entire fan, and the sets are arranged at right angles to each other—that is, those at one end are at right angles with those at the other end. This breaks up the tone and gives a string-like effect, instead of those marked pulsations which so much resemble the ordinary valve-tremolo. When the fan is extended to influence both the base and treble portions of the instrument a repe-

tion of the blades at the same angle should be fixed to a longer axle. In such case there would be eight blades instead of four, as in the former case. The screen D^3 at the back of the fan serves to direct the sound forward toward the player and the wind pulsations toward the suction-reeds, so that they may be more sensibly affected than they would otherwise be. The starter D^4 , Fig. 3, is for the purpose of overcoming the inertia and giving momentum to the fan simultaneously with the drawing of the stop to which it is attached. It is jointed to the lever d^1 , and its under surface exerts a considerable friction upon the shaft of the tremolo when it is drawn forward in the act of letting on the wind, and thus aids in setting it instantly in motion at full speed. When fully drawn forward it is clear of the shaft, and is then held up by the contact of the shoulder d^2 on the lever d^1 .

An important feature of this instrument is the hinging of the upper actions to each other and to the wind-chest B. The reed-pan F is hinged at the back, and held down on soft cushions of leather by harmonium-hooks, one at each end. The upper tube-board and wind-chest, with the stop-work attached thereto, are hinged as follows: A piece of wood or metal, in which the pivots of the stop-rollers work, is screwed to each end of the reed-chest O, and extends backward, and is pivoted to an upright, (shown by dotted lines in Fig. 1,) fastened to each end of the reed-pan F. The upper reed-chest O may also be held down by hooks. The main wind-chest B is hinged at the back, so that it will lift from the trunks.

It will be seen that by these arrangements the various parts are accessible without inconvenience.

It may not be necessary to explain the advantages, or give the reasons in full for all the features above described. Thus, in reference to the springs for the reservoir K^1 , it will be understood that a weighted reservoir having uniform pressure for operating reeds alone is not so good as reservoirs acted on by springs, which give variations of pressure and power.

Many of the features of my instrument may be greatly varied without sacrificing all the benefits of the invention. For example, it might be preferable to inclose the expression-valve i^1 in a box, with openings into both the reservoir L and wind-trunk I, so that the tendency of the air-current would be to keep the valve closed.

It is practicable to mount the reeds in the tube-board O^1 in any position between the vertical and horizontal, and at the same time to control the speaking by my self-adjusting pallets o^1 . It is also optional to place the tube-board O^1 in its forward position above the stop-rail, in which case tracker-pins will connect the pallets o^1 with the keys C, and the stop-draws will pass between the said tracker-pins.

It is optional, for the mounting of my trem-

olo, either to add a supplementary pressure or suction bellows to a suction instrument, or a supplementary pressure and suction bellows to a pressure instrument. It is also optional to drive the fan through the medium of an ordinary inclosed motor with suitable valve attachments.

Flexible tubing may be used for air communication instead of the trunks K^7 .

I claim as my invention—

1. The expression-valve i^1 in the trunk I, in combination with the chest B, bellows or exhaust L^2 , and reservoir L, substantially as herein specified.

2. The levers i , connections l^1 , bracket-levers l^2 , and pin l^3 connecting from the stop-draw to the said expression-valves i^1 , the several parts being arranged relatively to each other and to the support-board L^1 and reservoir L and to the bellows L^2 , as and for the purposes specified.

3. The reed-pan S with its naked reeds s , mounted below the main wind-chest of a suction-reed musical instrument, as herein specified.

4. In combination with reeds and bellows a , a percussion action, consisting of hammers H, hoppers or jacks J, springs j , and regulators h , when combined and arranged as and for the purposes specified.

5. The reed-pan S with reeds s and suitable connections to suction-bellows, in combination with each other and with a percussion action, when the reeds s and the percussion mechanism are arranged outside the wind-chest, all substantially as herein specified.

6. In a reed musical instrument, the air-passage O^3 , valve o^2 , and lever o^3 in the upper reed-chest O, all arranged above and toward the front of the keys and wind-chest B, substantially as specified.

7. The coupling action between the keys C and pallet-levers f , consisting of the hinged piece X carrying coupling-levers X^1 , and suitable connections to the stop-draw, x , combined and arranged as and for the purposes herein specified.

8. The reed-pan F with its connecting-feeder K, reservoir K^1 , support-board K^2 , and suitable wind-passages, all arranged and operated substantially as described, in combination with reeds operated by a separate wind apparatus, as herein specified.

9. In a reed or cabinet organ, a fan-tremolo, in combination with means for operating the reeds K of the pan F by pressure, and blowing outwardly through the tremolo, as herein specified.

10. The supplementary pressure-reservoir K^1 and feeder K, in combination with a suction instrument and means for operating a tremolo-fan by blowing a connected motor, when said parts are combined and arranged substantially as specified.

11. The pressure wind apparatus K K^1 , pressure reed-pan F, and mechanism for blowing upon the fan-tremolo wheel D, in combi-

nation with suction-reeds and suction-wind apparatus, as herein specified.

12. The uninclosed fan-motor D, arranged relatively to the fan-tremolo D² and to a set of pressure-reeds, *k*, as herein specified.

13. An uninclosed fan-motor, in combination with the directing-nozzle D¹ and suitable connections for conducting the air thereto, and with the controlling-valve *d*, all substantially as herein specified.

14. The screen D³, in combination with motor D, and arranged relatively to the fan or tremolo, as and for the purposes described.

15. The top chest O and its connections, and the reed-pan F and its connections, hinged together and to the body of the instrument, so as to be conveniently opened and closed, as and for the purposes herein specified.

In testimony whereof I have hereunto set my hand this 4th day of June, 1873, in the presence of two subscribing witnesses.

MASON J. MATTHEWS.

Witnesses:

WM. C. DEX,
ARNOLD HÖRMANN.