(No Model.) 2 Sheets—Sheet 1.

M. GALLY.

MUSICAL INSTRUMENT.

No. 344,646. Patented June 29, 1886.

Fig. 1.

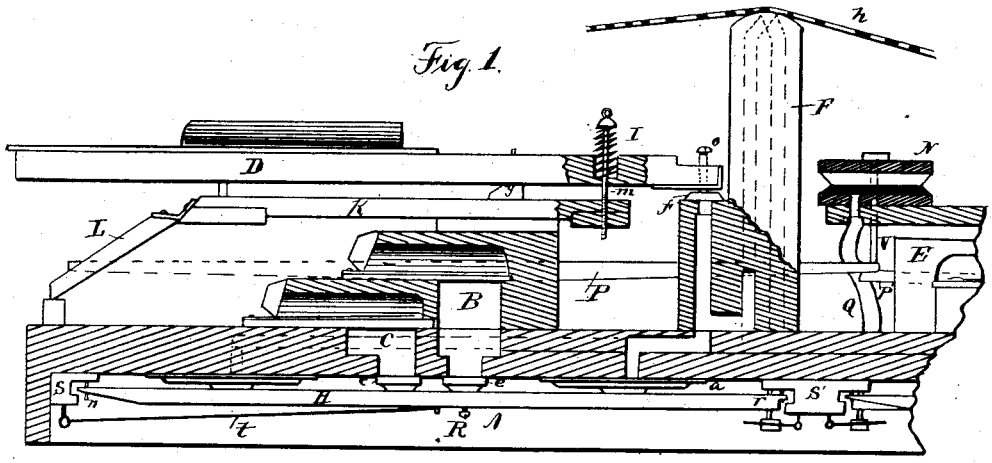


Fig. 2.

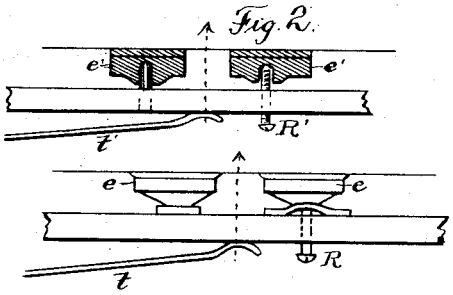
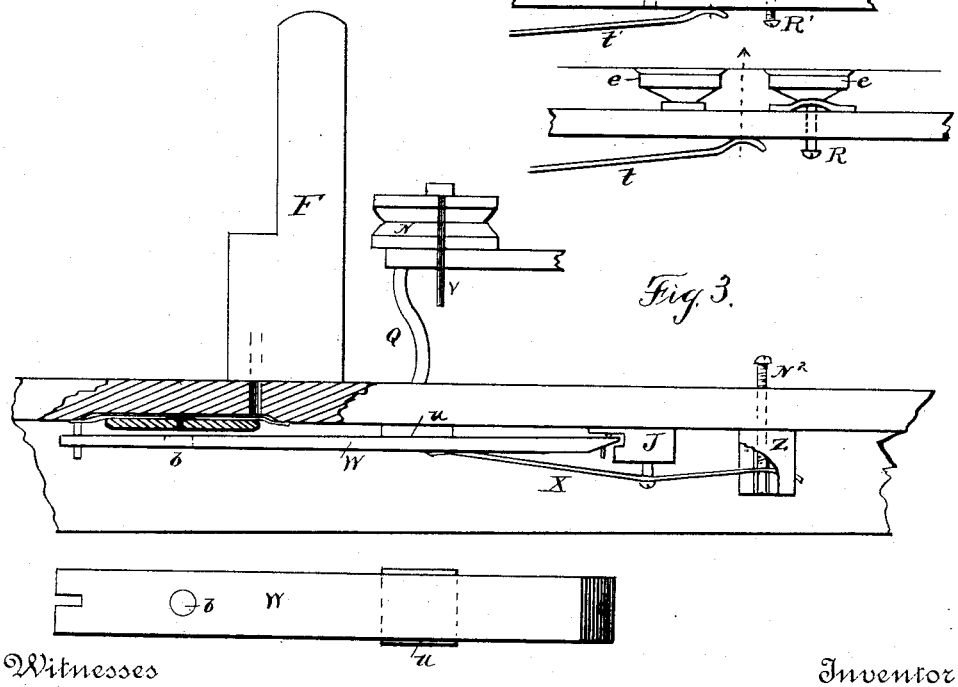


Fig. 3.



Witnesses
C. W. H. Byron.
M. L. Williams.

Inventor
Merritt Gally
By his Attorney
W. A. Bartlett

(No Model.)

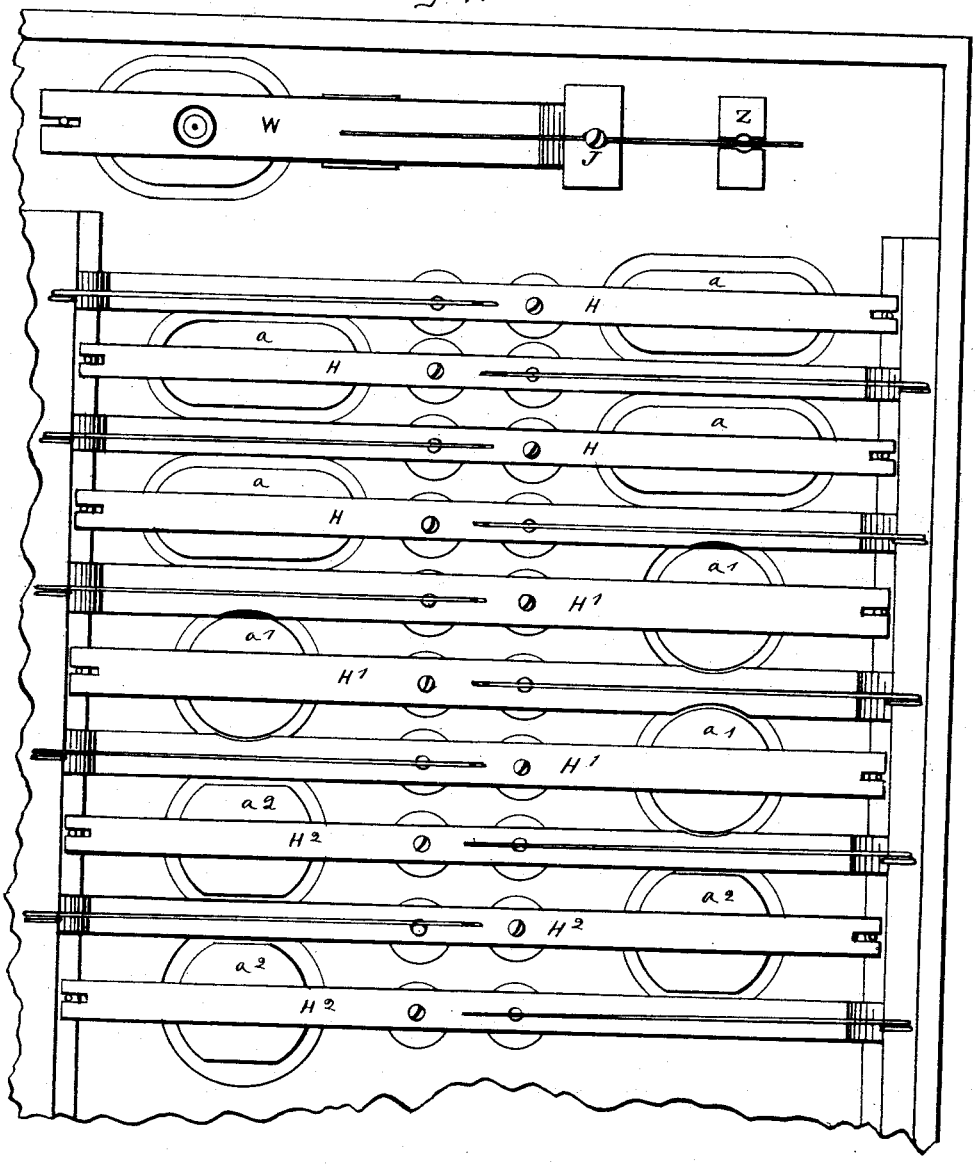
2 Sheets—Sheet 2.

M. GALLY.

MUSICAL INSTRUMENT.

No. 344,646. Patented June 29, 1886.

Fig. 4.



Witnesses.

Robt. A. Gally.

D. B. Gally

Merritt Gally.

Inventor.

UNITED STATES PATENT OFFICE.

MERRITT GALLY, OF NEW YORK, N. Y.

MUSICAL INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 344,646, dated June 29, 1886.

Application filed September 17, 1885. Serial No. 177,381. (No model.)

To all whom it may concern:

Be it known that I, MERRITT GALLY, residing at New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Musical Instruments, of which the following is a specification, reference being had therein to the accompanying drawings.

In the accompanying drawings, Figure 1 is a sectional view of a part of the wind-chest and action of a reed-organ embodying the several features of my invention. Fig. 2 is enlarged views of the reed-valves and their levers, showing the principle of their operation. Fig. 3 is a side and plan view of pneumatic valve with adjustable valve-spring; and Fig. 4 is a plan view of the pneumatics, valves, and valve-levers.

In reed-organs in which two or more sets of reeds are used, operated by a single set of valves and windways, it is necessary that these valves be long and cover much more surface of windway than would be necessary to give full tone to all the sets if sounded by separate valves. This is especially the case if unison-sets are employed, as they are otherwise liable to throw each other out of tune.

In a sensitive pneumatic action it is difficult to operate large or long valves with large surface of windway, as such construction requires pneumatics of such power as to make the action slow of operation, and therefore unfit for rapid music.

In Fig. 1 I show two sets of reeds, B C, which may be unison-sets, or otherwise, as the case may require. I give to these sets separate windways and separate valves, *e e*, having the windways as small as will produce for each a full tone of its reed. I place across these two valves, which are to be operated together, a valve-lever, H, which I leave perfectly free at both ends, *n* and *r*. The valves are self-adjustable valves as to their valve-seats, as more particularly shown in the enlarged view, Fig. 2. By bringing the valve-spring *t* upon the valve-lever between the two valves both the valves are adjusted to their seats by the pressure of the spring. If the spring is made to bear exactly midway between the valves, the pressure on them will be equal, which is the proper position when the valves are of equal size. If the valves are of unequal size, I move the bearing of the spring proportionately nearer the larger valve. This equalizes the resistance of the valve against the air-pressure.

When the pneumatic motor *a* moves valve-lever H, the lever has first a slight movement at *n* until it touches the block S, which block then becomes the fulcrum of the lever, and both valves are moved from their seats. On the return movement of the lever the valve nearest the fulcrum S touches its seat first and forms a fulcrum for the lever, which, leaving fulcrum S, brings the other valve firmly to its seat by means of the action of the spring, which presses between the two valves.

In order that the valve-lever may be easily adjusted so that it will be only slightly free from the fulcrum S when the valves are on their seats, I make the lever adjustable as to one of its valves, and the other valve as a fulcrum for the adjustment.

In Fig. 2 two styles of valves are shown, the self-adjusting valves *e' e'* being made with socket and pin, and the valves *e e* being connected to the valve-lever by means of a yielding joint of soft leather. For the valve *e'* at the right of figure I show a screw, R', passing through the lever and acting as the valve-pin. With this screw the position of the lever is easily adjusted, the other valve *e'* being the fulcrum of adjustment. For the valve *e*, I attach only the ends of the connecting leather to the lever and the central portion of the leather to the valve, and with the screw R pressing against the leather I make the adjustment of the valve-lever.

The action is shown as being operated both by manual and mechanical or automatic action, D representing the manual key-board, and *h* the mechanical perforated music-sheet. The air-ducts lead from the pneumatic action to the music-sheet through the tracker-range F, and also to the vent-valves *f* of the manual.

In Fig. 1 I show a peculiar adjusting device for holding the vent-valve of the manual-key to its seat, and also for adjusting the "touch" of the key. The key D rests on an ordinary fulcrum, *y*, which is placed upon the key-frame K. Between the fulcrum *y* and the valve-seat at *f*, I pass loosely through the key D a wire, *m*, with a screw cut in one end and a head or button at the other. The screw enters the key-frame under the key, and, passing up through the key, has a coiled spring between the head and the key. In order to have the bearing of the spring as near as possible

to the point where the wire enters the opening of the key from below, I make a socket in the key nearly through its body and place the coiled spring in the socket, as shown. By turning the screw more or less into the key-frame the touch can be adjusted to suit the desire of any performer; at the same time the spring-pressure acts as a means of holding the vent-valve *f* to its seat.

I attach the vent-valve *f* to the key D by means of a piece of yielding leather, and through the key over the valve I put a set-screw, O, for raising or lowering the key while the valve remains in its seat. I use these screws O for "leveling" or bringing into line all the keys of the manual, which saves the greater labor of "packing up" at the fulcrum *y* of the keys.

In Fig. 1 the swell L is shown as operated by the large pneumatic motor N. This pneumatic connects with the air-chest A through tube Q. At the port of this tube Q in the wind-chest is a valve, *u*, Fig. 3, operated by valve-lever W. The lever W is actuated by a small pneumatic, as shown, which pneumatic connects with the tracker-range *h*, or with key or knee swell, as desired. The valve-lever W is not necessarily removed from the presser of the pneumatic, and is shown as lying across it. In order to prevent the lever from stopping the vent of the presser, a hole, *b*, is cut through the valve-lever under the vent. A groove or other opening for windway may be made either in the lever or the presser, instead of the hole *b*, for preventing the lever from stopping the vent. This style of pneumatic and valve lever may also be used for the sounding devices with equal effect.

It is necessary to adjust the tension of the valve-springs of a pneumatic action carefully and accurately to insure proper action of the valves, and when these springs are situated within the wind-chest such adjustment usually requires taking the instrument apart and putting it together a number of times before the work is completed. To avoid this labor I make the spring adjustable from the outside of the wind-chest, as shown in Fig. 3. At the block J, I make a fulcrum for the spring X, either by taking a turn of the wire under a screw-head, as shown, or otherwise pivoting the spring at this point. I then extend the rear end of the spring through a slotted block, Z. From the outside of the wind-chest I pass through its wall a screw, N^2, which extends through into the slot of block Z against the lower end of the spring. By means of the screw N^2 it will be seen that the spring X can be set to any desirable degree of tension from outside the instrument.

In Fig. 4 is shown a plan of the valve-levers, valves, and pneumatic motors. In order to make the pressers of the motors as large as possible in an organ of narrow range it is my custom usually to set the valve-levers sufficiently far removed from the pressers to prevent the movement of any lever by the action of the presser of an adjacent lever. In such case the lever of one motor can be allowed to cross the edge of an adjacent motor. This construction makes the wind-chest deeper than is sometimes desirable, and to some extent complicates the action.

In order to be able to place the levers near to or touching the pressers, I shape the pressers and levers as shown in Fig. 4. Pressers *a* are made long and sufficiently narrow to clear in their movement the adjacent levers. For the circular pressers *a'*, I cut away a portion of the adjacent lever H', as shown, or cut away a sufficient portion of the circular presser, as a^2. The levers H' and H^2 can be made wider than levers H, and have an advantage in the part of the action where the valves are small, as the increased width of the lever prevents rocking when the lever takes its bearing on its fulcrum.

What I claim as my invention is—

1. The combination, with two sounding devices, of a single valve-lever, a self-adjusting valve for each sounding device supported on said lever, and a pneumatic motor, also supported on said lever, substantially as described.

2. The combination, with the two self-adjustable valves, of the valve-lever and an adjusting-screw, connecting with one of the valves, for adjusting the position of the lever.

3. In combination with the valve-lever, a spring bearing on said lever at one end and a slotted guide for the other end of the spring, and a screw bearing on the spring to raise or lower it in the slotted guide, and thereby adjust its tension, as set forth.

4. In combination with the valve-levers of a musical instrument, a series of springs supported within the wind-chest and bearing on said levers, and an adjusting-screw for each spring extending outside the wind-chest, whereby each spring may be separately adjusted from outside the wind-chest, as set forth.

5. In the pneumatic action of a musical instrument, the valve-lever cut away to avoid interfering with adjacent pneumatic motors, substantially as specified.

6. In the pneumatic action of a musical instrument, the pneumatic presser, cut away at its edges to avoid interfering with adjacent valve-levers, substantially as specified.

7. In a pneumatic valve-action of a musical instrument in which the valve-lever is operated by means of contact of the pneumatic presser, the windway, as *b*, for preventing the lever from cutting off the vent-duct of the presser.

In testimony whereof I affix my signature in presence of two witnesses.

MERRITT GALLY.

Witnesses:
WM. A. GALLY,
D. B. GALLY.