R. W. PAIN.

Mechanical Musical Instrument.

No. 218,308. Patented Aug. 5, 1879.

Fig 1.

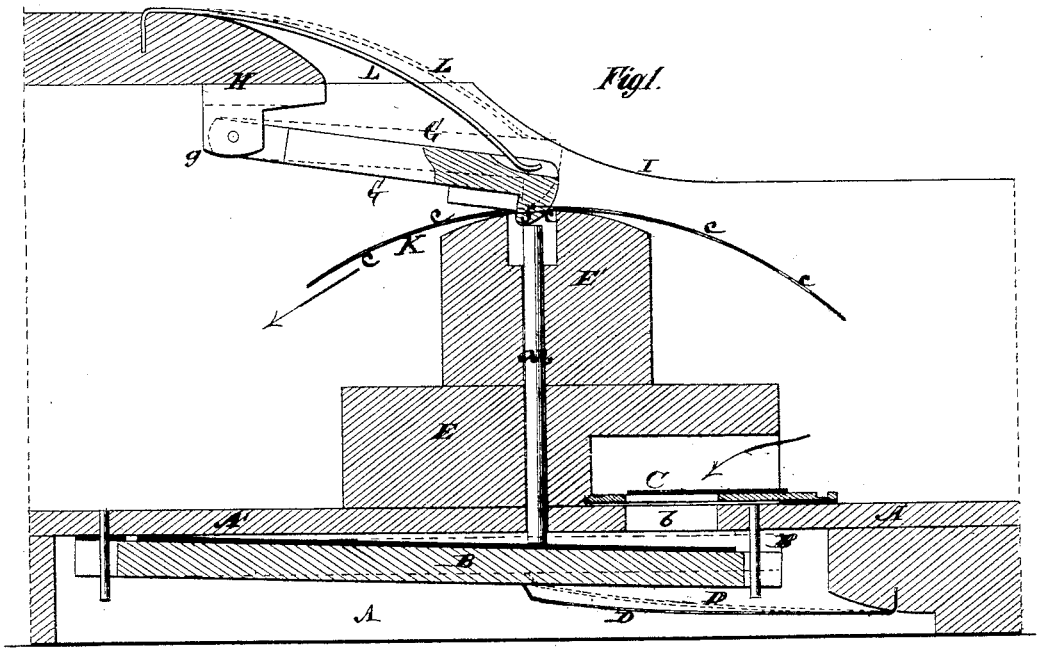
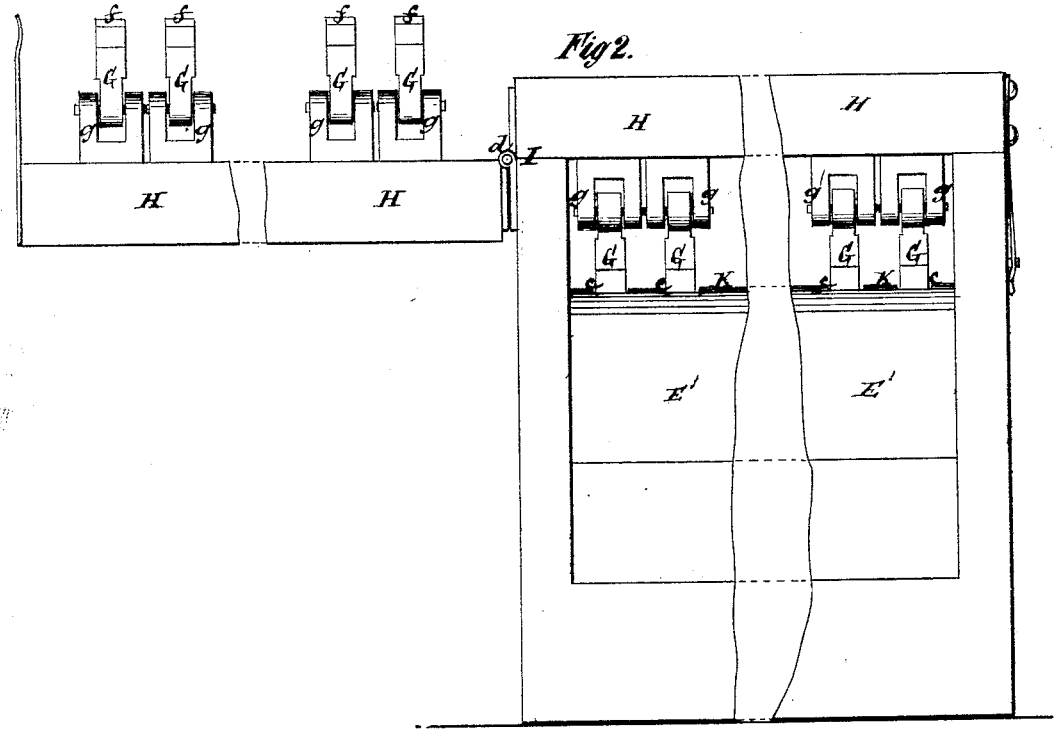


Fig 2.



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UNITED STATES PATENT OFFICE.

ROBERT W. PAIN, OF NEW YORK, N. Y., ASSIGNOR TO E. P. NEEDHAM & SON, OF SAME PLACE.

IMPROVEMENT IN MECHANICAL MUSICAL INSTRUMENTS.

Specification forming part of Letters Patent No. **218,308**, dated August 5, 1879; application filed September 20, 1878.

To all whom it may concern:

Be it known that I, ROBERT W. PAIN, of the city and State of New York, have invented certain Improvements in Mechanical Musical Instruments, of which the following is a description, reference being had to the accompanying drawings, forming part of this specification.

This invention relates to apparatus or means for playing on organs and other musical instruments of like character in which perforated strips or sheets of paper or other material are set in motion and by their travel or passage are made to actuate or control the action of valves which determine the admission of air to the reeds or pipes of the instrument, whereby music may be produced without any skill on the part of the player.

The improvements consist in a novel combination of the perforated strips or sheets with the sound-producing devices, reeds, or pipes and valves of the instrument, and in certain novel means through which the perforated sheets or strips are made to control the action of the valves, whereby a very effective operation of the instrument is obtained and great facility for removing and replacing the reeds afforded; also, in certain means whereby very convenient provision is afforded for the insertion of the perforated sheets or strips.

In the accompanying drawings, Figure 1 represents a vertical section of so much of a reed-organ as is necessary to illustrate my invention, and Fig. 2 a back elevation of the same.

A is the wind chest or receiver of the instrument. A′ is what is known as the "action-board," forming the top of the wind-chest and containing passages *b*, over which, in this example of my invention, reeds C are placed. E is the reed-board, containing passages *p*, in which the reeds C are placed. B B are valves arranged within the wind-chest below the reeds, and having their seats on the lower face of the action-board A′. D D are springs applied to the valves to press them upward against the board A′, for the purpose of controlling the passages *b*. Although only one set of reeds is here shown, the instrument may have two or more sets.

G G are jacks, levers, or key-moving fingers, the rear ends of which are pivoted to flanges *g*, secured to a rail, H, arranged above and behind the reed-board. The front ends of these jacks are provided with rounded or beveled downwardly-projecting noses *f*, situated over push-pins or key-moving rods M, which pass through the reed-board E, and which bear upon the valves B B. Springs L L are applied to these jacks to press them down upon the push-pins M, for the purpose of opening the valves B B. These springs must be of such strength as to overcome the upward pressure of the valve-springs D D.

K is a perforated sheet or strip of paper or other material. There may be one such strip for every valve and reed, or one for two or more valves and reeds, each having as many longitudinal rows of holes in it as may be necessary, according to the number of valves which it is intended to actuate or control. The said sheets or strips may be either continuous or not—that is to say, they may be in the form of endless bands or have their ends disconnected, and may be moved by rollers or other suitable means. The portion or portions of each sheet or strip which is at any time operative is supported upon a fixed rail or projection, E′, above the reed-board E, between which and the jacks G G the sheets or strips pass in the direction of the arrow shown near the strip or sheet in Fig. 1.

By the arrangement of parts here shown and described each perforated strip or sheet K travels, when operated to play the instrument, over the rail E′ and beneath the jacks G, or, in other words, between the jacks G and the valves B, which are on opposite sides of the perforated strip or strips, and the valves are opened by the jacks working through the perforations in the strips.

The disposition and length of the perforations in each strip K and their relation to the several valves B determine the notes or length of notes sounded by the reeds. When the unperforated portions of each sheet or strip K pass under the nose *f* of either jack G, said jack is raised and held up against the pressure of its spring L, and the corresponding valve B is closed by its spring D; but when

the perforations *c* in the sheet or strip come under the nose *f* of the jacks, then the latter is, by the greater pressure produced by the jack-spring L as compared with that of the valve-spring D, caused to depress the push-pin M and open the valve, and thereby to produce the sounding of its respective reed.

In order to provide for the easy introduction of the perforated strips or sheets between the jacks and the pins M, the jack-rail H is attached by a hinge or hinges, *d*, at one end to the frame I or case of the instrument, so that it may be turned aside or over, as shown at the left-hand side of Fig. 2, and so leave the place as to be occupied by the strips or sheets uncovered. When the latter have been introduced the rail is turned back to the position shown at the right hand of Fig. 2 over the rail E′.

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

1. In a musical instrument, the combination of a perforated strip or sheet, jacks, levers, or key-moving fingers arranged on one side of said perforated strip or sheet, and push-pins arranged on the other side thereof, and the jacks, levers, or key-moving fingers arranged to operate upon the upper ends of the push-pins through the perforations in said strip or sheet.

2. In a musical instrument, the combination of a perforated strip or sheet, a series of jacks, levers, or key-moving fingers, arranged upon one side of the said strip or sheet, to operate through the perforations of such strip or sheet, and a series of keys and push-pins or key-moving rods actuated by said jacks, levers, or key-moving fingers, and situated on the opposite side of said strip or sheet.

3. In a musical instrument, the combination of valves, vertical push-pins or valve-moving rods, a perforated strip or sheet, and jacks, levers, or key-moving fingers arranged above the perforated strip or sheet, and constructed to operate upon the upper ends of the push-pins through the perforations in the strip or sheet.

4. The combination, with the valves of a musical instrument and with jacks, levers, or key-moving fingers for operating the said valves, of a perforated strip or sheet for working between the said jacks, levers, or key-moving fingers and valves, substantially as herein described.

5. The combination, with the valves of a musical instrument and with jacks, levers, or key-moving fingers adapted for opening the said valves under the control of a perforated sheet or strip, of springs for closing the said valves and springs applied to the said jacks, levers, or key-moving fingers for overcoming the pressure of the first-named springs, as permitted by the said sheet or strip, substantially as herein described.

6. The combination, with the valves B of a musical instrument and the jacks, levers, or key-moving fingers for operating the same, of a rail or support, E′, adapted to receive and support a perforated strip or sheet arranged between the said jacks, levers, or key-moving fingers and the valves, substantially as herein described.

7. The combination of the reed-board E, reeds C, valves B B, push-pins or key-moving rods M, jacks, levers, or key-moving fingers G G, and springs L L, substantially as described.

8. The rail H, supporting the jacks, levers, or key-moving fingers, hinged at the end to the frame or case of the instrument, so that it may be swung over lengthwise, substantially as and for the purpose herein set forth.

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Witnesses:

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