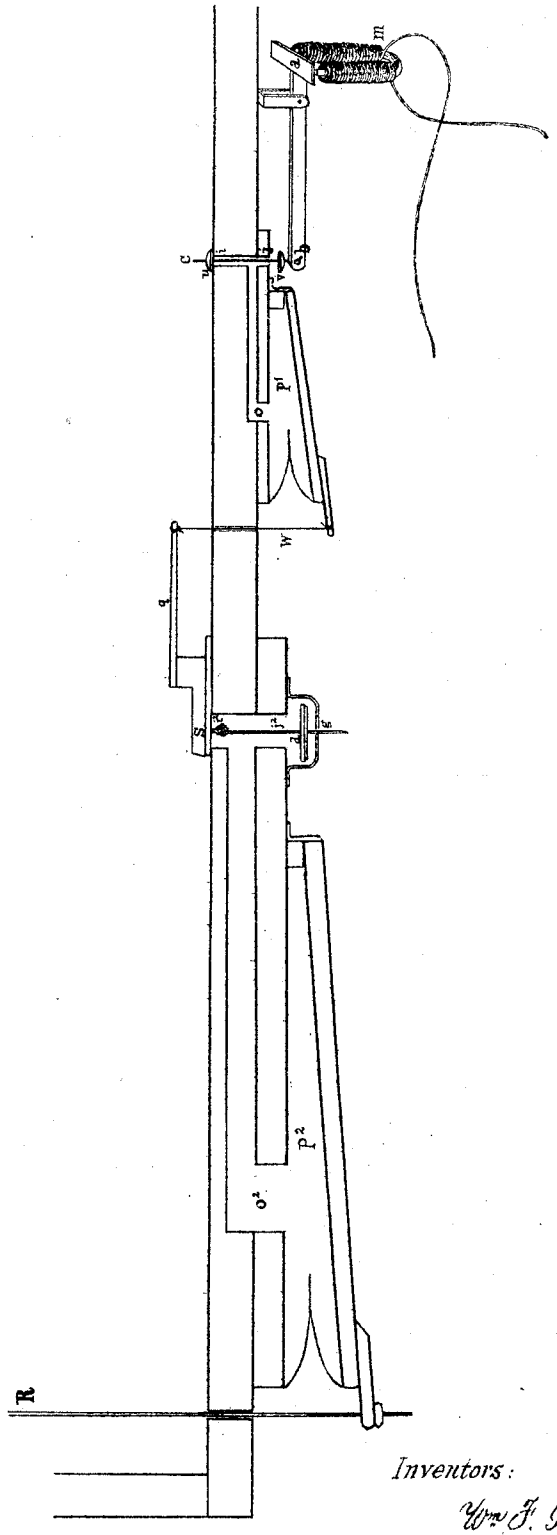
W. F. SCHMOELE & H. SCHMOELE, Jr.

Electro-Pneumatic Actions for Musical Instruments.

No. 145,532. Patented Dec. 16, 1873.



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UNITED STATES PATENT OFFICE.

WILLIAM F. SCHMOELE AND HENRY SCHMOELE, JR., OF PHILADELPHIA, PA., ASSIGNORS OF ONE-THIRD THEIR RIGHT TO CHARLES SCHMOELE.

IMPROVEMENT IN ELECTRO-PNEUMATIC ACTIONS FOR MUSICAL INSTRUMENTS.

Specification forming part of Letters Patent No. **145,532**, dated December 16, 1873; application filed March 7, 1873.

To all whom it may concern:

Be it known that we, WILLIAM F. SCHMOELE and HENRY SCHMOELE, Jr., of Philadelphia, Pennsylvania, have invented an electro-pneumatic action for operating the pallets, slides, and pedal-pallets in organs, the keys and pedals in pianos, and the beater in drums, of which the following is a specification:

Our invention consists in the use of wind-pockets connected with and operated by an electric action, constructed and arranged as hereinafter described.

The magnet *m* is connected with its appropriate reader on the reading apparatus described in an application for a patent on a "method and instruments for reading and performing music by electricity," filed October 12, 1872, and also with the corresponding key on an electric key-board, when this latter is inserted in the instrument for purposes of manual performance. The separate or adjunct reading-circuit described in said application of October 12, 1872, is dispensed with when the electro-pneumatic action is used, sufficient electricity for which can be passed through the thinnest metallic film or note. The magnet *m* is, therefore, placed in the same circuit with its reader, and operates its armature *a*, fastened to the short arm of the lever *ab*, at whose opposite end *b* is attached the screw-threaded wire *bc*. The primary pocket p^1 is composed of a fixed and a movable leaf, connected together by a fold or rib of kid or other soft leather. An opening, *o*, in the fixed leaf communicates with the groove *oij* in the bottom board of the wind-chest, or in any conduit containing wind, which groove, at its other end, terminates in two openings, *i* and *j*, both in line with each other, the one, *i*, entering the chest, and the other, *j*, communicating with the open air. Through these two openings *i* and *j* passes the screw-threaded wire *bc*, which swings with a free motion upon the lever *ba*, and has upon it two small nuts, *u* and *v*. The upper nut, *u*, is in the wind-chest, and is adjusted upon the threaded wire *cb*, so as to close the opening *i* into the chest when the lever *ab* is at rest. The lower nut, *v*, is in the open air, and is adjusted so as to close the lower opening when the magnet acts. Each nut has a piece of kid under it, in order to close the openings tight. When the magnet acts, the opening *i* into the chest is opened, and the lower opening, *j*, simultaneously closed, and the wind, entering the primary pocket, forces out its movable leaf. This leaf is attached, by the cord *w*, to the lever *q* of the valve *s*, which is thus opened when the wind enters the primary pocket. Attached to the valve *s* is a screw-threaded wire, *sdg*, bearing the disk *d*, which, like the lower nut, *v*, on the wire *cb*, is so adjusted as to close the exit j^2 when the valve *s* is opened. A guide for this disk *d* is formed by passing the end *g* of the threaded wire *sdg* through the hole *g* in a piece of metal bent in the shape of a **U**, with the perforation made in the crook or bend of the **U**. The secondary pocket p^2 is constructed exactly like the primary, but on a larger scale, and when the valve *s* opens, through the action of the primary pocket, the disk *d* having simultaneously closed the exit j^2, the wind rushes into the secondary pocket, and forces out its movable leaf. This leaf is attached to whatever resistance, R, is to be worked—to a pallet or a slide in the organ, a key or a pedal in the piano, or to the beater in the drum.

The position of the secondary pockets is immaterial, as the wind can be carried to them wherever they may be placed by lengthening out their grooves, thus leading the wind in any direction desired. In organs they are best placed under the wind-chest, immediately beneath the pallets they are to work, and upright on the sides of the chest when they are attached to the slides. In pianos they are located below the keys to which they are attached, and are arranged in several rows or tiers, as the width of the pockets exceeds that of the keys they work.

The size of the pockets varies with the wind-pressure employed, decreasing as the latter is increased.

When the piano is built alone, a bellows and reservoir must be placed beneath, to supply the necessary wind. When attached to the organ, which forms a very effective and beautiful combination instrument, the same bellows

supplies both. In very small organs, where the resistance of the pallets is very inconsiderable, the small pockets may be made to perform the office of the larger ones by attaching them directly to the pallets.

We claim as our invention—

1. The use or application of an electro-magnet to operate a wind pocket or pockets employed to work the valve, substantially as set forth.

2. The form of pocket and valves employed, admitting the wind by a groove with double aperture, controlled by two valves or nuts opposed to each other on a screw-threaded wire, substantially as set forth.

3. The small or primary pocket with diminutive valve to control the large or secondary pocket, which operates the pallet or other resistance, substantially as described and set forth.

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