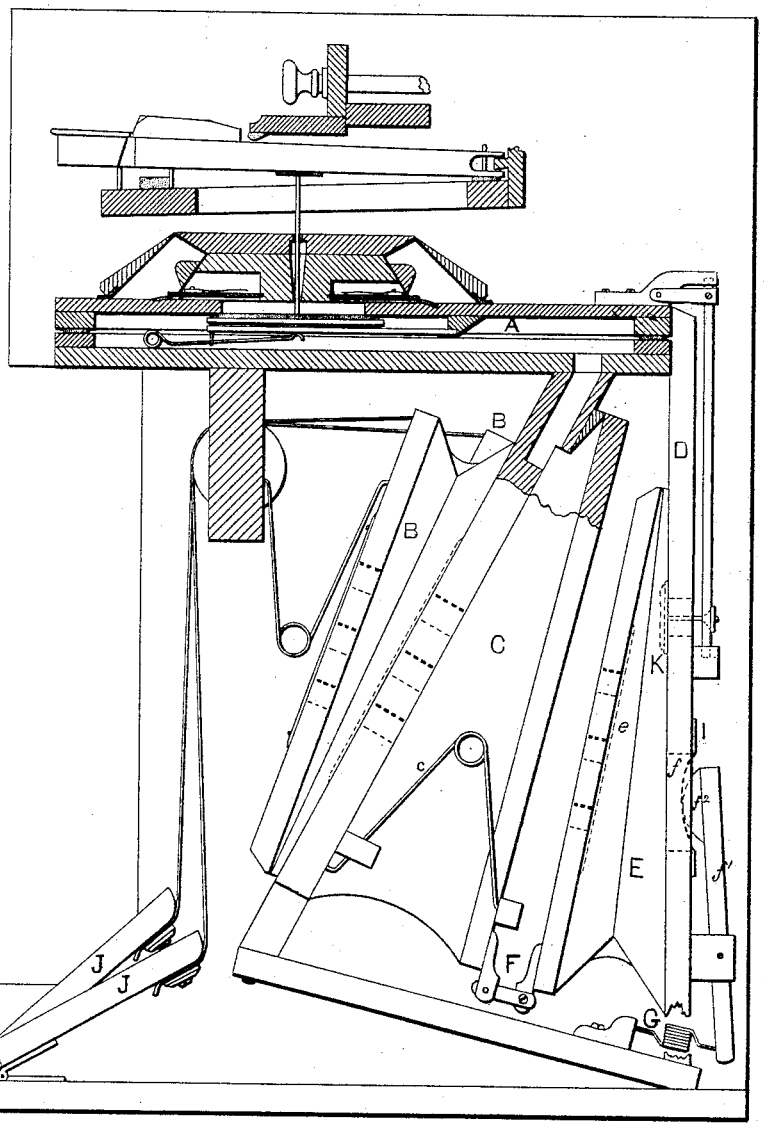
M. J. MATTHEWS.
Reed-Organ Bellows.

No. 209,496. Patented Oct. 29, 1878.



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MASON J. MATTHEWS, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN REED-ORGAN BELLOWS.

Specification forming part of Letters Patent No. **209,496**, dated October 29, 1878; application filed October 14, 1876.

To all whom it may concern:

Be it known that I, MASON J. MATTHEWS, of Boston, in the State of Massachusetts, have invented certain Improvements in Reed-Organs, of which the following is a specification:

My invention relates to reed-organs and to the means for increasing therein the capacity for expression.

It consists of an auxiliary pressure-bellows and other mechanism which, operating in connection with the ordinary exhaust-bellows of the instrument, gives the player control of the wind force, so that he may make transitions from one degree of power to another suddenly, or gradually and smoothly, at will.

I call my invention "automatic expression," for the reason that, in a considerable measure, it is self-acting, and in this respect different from the ordinary and well-known expression of the harmonium. In the latter case, (the case of the harmonium,) when the expression-stop is drawn the reservoir is inoperative, and the wind is supplied by the feeders alone, so that there is no continuous pressure except as it is produced by a skillful manipulation of the treadles.

This form of expression is seldom employed in cabinet-organs, because, first, the mechanism required for this stop in these instruments is more complicated and expensive than that used in the harmonium; second, the reeds of a cabinet-organ are too small to safely admit of all the pressure that may be produced by such an expression; and, third, there are very few players who can use it.

The "automatic swell" used by the Mason & Hamlin Organ Company has hitherto been the most approved means for varying the tone-power.

The automatic swell consists of a simple mechanical connection between the reservoir and the shutters over the reeds. These shutters are opened and closed automatically according to the varying degrees of air-power in the reservoir. The one objection to this excellent device is that it is only available for long-swell passages. My automatic expression is not open to such objection, nor to the common objection raised against the harmonium expression.

That my invention, both as to the manner of its construction and purposes for which it is designed, may be clearly understood, I subjoin the following specification, of which the accompanying drawing forms a part.

The figure is a sectional elevation, representing the main features of the instrument.

A is the wind-chest, which, together with all the parts above it, are of ordinary construction. B represents the feeders, and C the reservoir. These together form a complete ordinary suction-bellows of a cabinet-organ. The manner of the operation of these bellows is so well known, besides being so clearly suggested in the drawing, that a full description is unnecessary.

Mounted on the support-board D is an independent pressure-bellows, E, constructed precisely the same as a harmonium-feeder. There is no pneumatic communication between the pressure-bellows E and the reservoir C. A mechanical connection is made by the link F. As the valve *e* in the pressure-bellows E opens inward, no resistance beyond ordinary is offered to the forward movement of the reservoir C; but there is opposed to its return outside atmospheric resistance, as well as the confined air in the pressure-bellows E. The atmospheric resistance is smaller or greater according to the number of openings from the wind-chest A to the outside air, so that the force brought to bear by the reservoir C upon the pressure-bellows E is more or less according to the number of reeds in operation.

The following describes the means for proportioning the resistance of the pressure-bellows E to the requirements of the reservoir C: A large hole, *f*, is made through the support D. This hole *f* is covered by rubber cloth I, which is glued all around the outside. Mounted on the support-board D is a lever, f^1, on the upper front of which is a round-faced piece of wood, f^2, nearly as large as the opening *f*. This round-faced wood f^2 is pressed against the rubber cloth I perforce of the spring G, which acts on the lower end of the lever f^1. This spring G is the same in construction as the springs *c*. The combined power of the two springs *c* employed in an instrument having two sets of reeds may be about twenty-six pounds. The spring G may be twenty pounds. While the reservoir C is be-

ing sucked forward the full force of the springs *c* is in operation, as in ordinary cases; but almost on the instant the treadles J are at rest, and the reservoir C is being distended, the operative power of these springs is greatly reduced, so that a soft pianissimo effect is obtained from the reeds—such an effect as would be produced by very weak springs. The rubber cloth I is forced outward against the resistance of the spring G in accordance with the return power of the reservoir C, so that the exhaust force of the bellows is sufficient for either single notes or chords. The valve K is opened and closed by suitable stop mechanism. When open the pressure-bellows E offers no resistance to the distension of the reservoir C. When closed the operation is as set forth.

Having thus particularly described my invention, I have to state that it is not restricted to the precise details herein described or delineated. Instead of the rubber cloth I, a small bellows might be employed. The valve K, if operated by a knee-action, would produce good swell effects. There may be two reservoirs and two of my automatic-expression apparatus, one to act on the base and the other on the treble. In this case it would be desirable that either feeder should operate both reservoirs. It would be necessary too to divide the wind-chest into base and treble compartments.

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

1. The independent pressure-bellows E, in combination with the reservoir C of a reed-organ, when constructed and arranged to operate substantially as and for the purpose described.

2. The combination and arrangement of the spring G, lever f^1, and rubber cloth I, or their equivalents, in combination with the pressure-bellows E, reservoir C, and feeder B of a reed-organ, substantially as and for the effect and purpose set forth.

3. In combination with the reservoir C of a reed-organ, the independent pressure-bellows E, having the valve K, constructed and arranged to operate substantially as and for the purpose set forth.

In testimony whereof I have herewith set my hand this 2d day of September, 1876, in the presence of two subscribing witnesses.

MASON J. MATTHEWS.

Witnesses:

JAS. H. SOUTHACK,

C. F. SOUTHACK.