

O. H. ARNO.

TREMOLOS FOR REED-ORGANS.

No. 177,610.

Patented May 23, 1876.

Fig. 1.

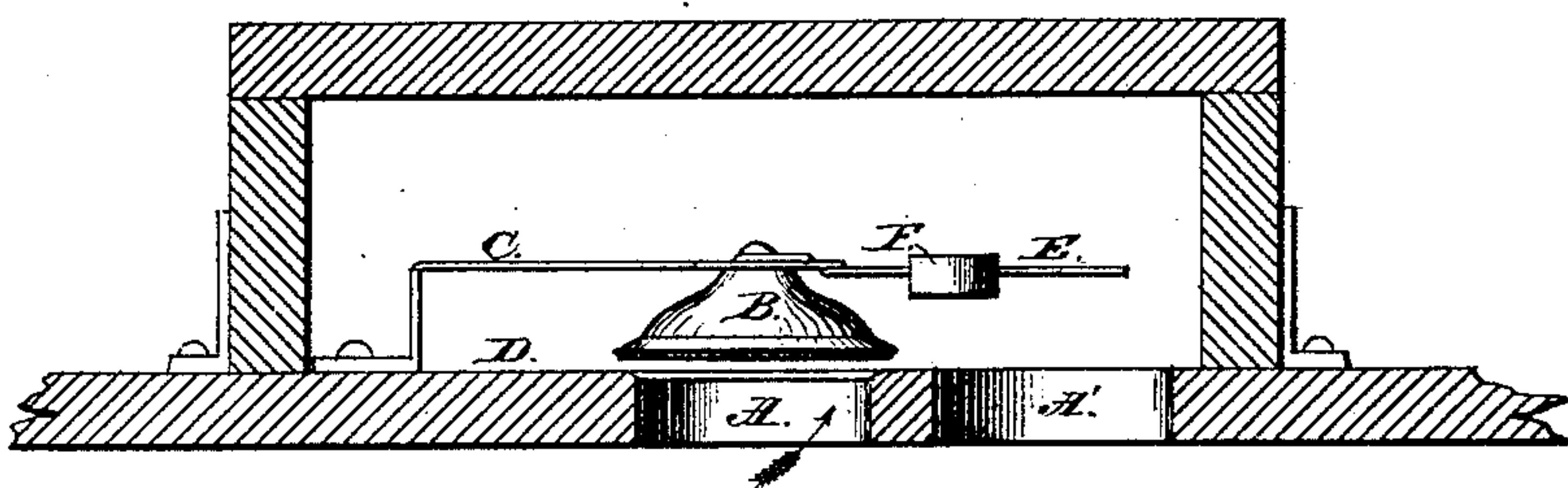
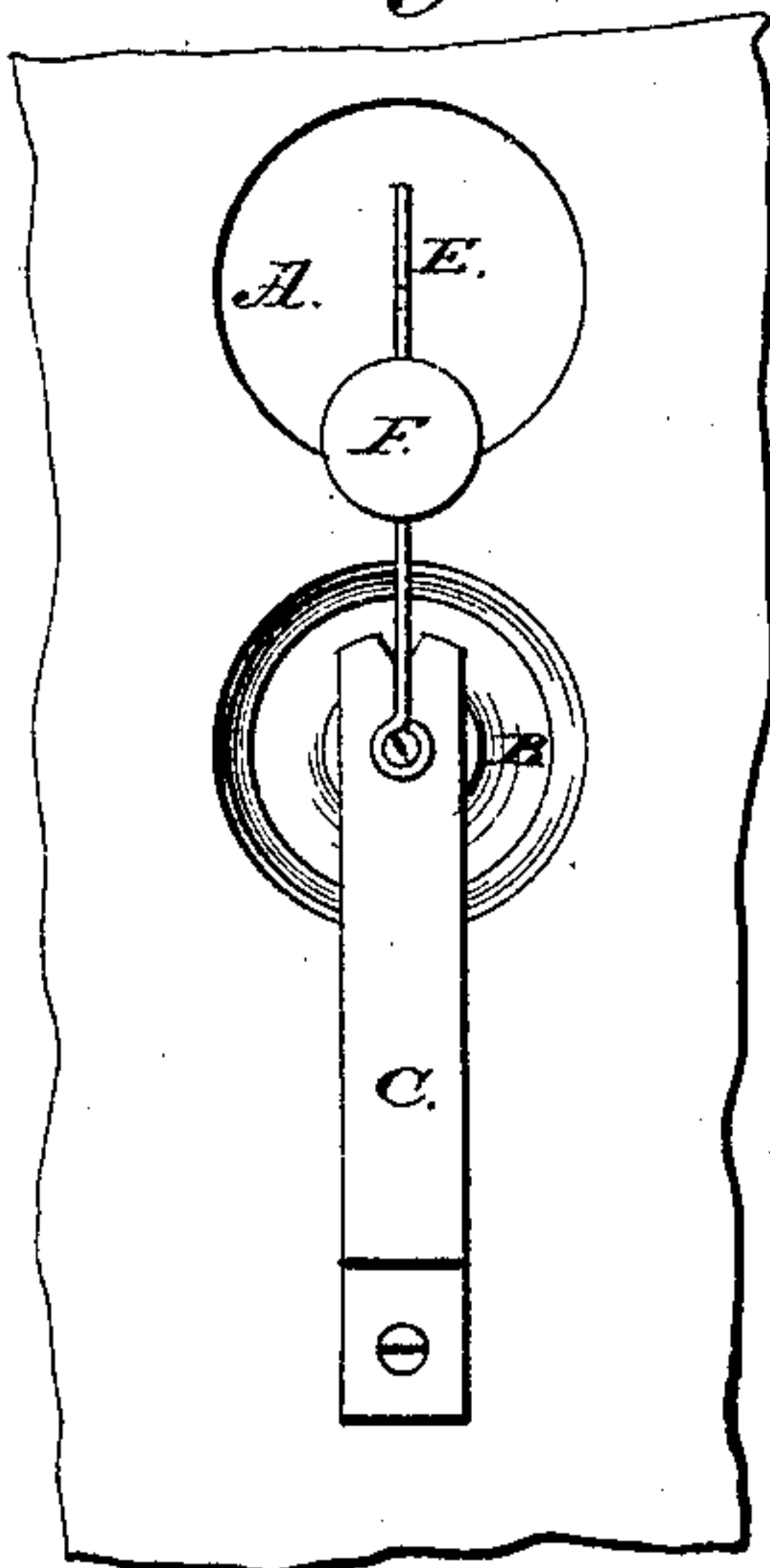


Fig. 2.



Fig. 3.



Attest:

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OLIVER H. ARNO, OF CAMBRIDGE, MASSACHUSETTS.

IMPROVEMENT IN TREMOLOS FOR REED-ORGANS.

Specification forming part of Letters Patent No. **177,610**, dated May 23, 1876; application filed October 11, 1875.

To all whom it may concern :

Be it known that I, OLIVER H. ARNO, of Cambridge, Massachusetts, have invented a Reed-Organ Attachment, of which the following is a specification :

My invention relates to an improved apparatus for producing in a reed-organ the effects commonly known as tremolo or tremulant. It is sometimes called valve-tremolo, to distinguish it from a somewhat similar effect produced by a revolving fan, and called fan-tremolo. The fan is mounted on the outside of the wind-chest of the instrument, and is connected with a motor-wheel, by which it is caused to revolve, so as to agitate the air and give to the tone a tremulous and emotional character. While this effect is pleasing, there are two objections to the means of obtaining it: first, it is expensive; second, an opening being made to the outside air, communicating with the motor-wheel, a considerable leak is caused, which is accompanied by a disagreeable noise. The valve is mounted inside a box of suitable dimensions. Two holes are made through the bottom of this box; one of these holes communicates directly with the wind-chest, while the other hole communicates directly with the reservoir. When the mechanism is in operation all direct communication between the wind-chest and reservoir is broken by suitable means, and the air-current is directed upward and through the hole on which the valve rests, and thence downward through the other hole to the reservoir.

The manner or principle of operation is as follows: When the keys of the instrument are depressed, a current of air is drawn or sucked through the reeds into the wind-chest, so that a pressure is brought to bear on the under face of the valve, which, as there is no resistance on the upper side of it, is forced open; but on the instant this is done, an equilibrium of pressure takes place on both the upper and lower sides of the valve, so that it drops to its seat or bed per force of its gravity, and thus by a rapid alternation between equal and unequal pressure, together with the gravity of the valve, the tone or sound is produced in short pieces, but in such quick succession that it appears to be one prolonged but undulated note. The valve in

common use is either hinged with leather or on pivots working in bushed holes. There are two material objections to a valve mounted on either of those plans. First, it makes a pounding noise. This defect has prevented a more general use of the valve-tremolo, and accounts for the favor bestowed upon the fan-tremolo, which is not quite so noisy. Second, there being no adequate provision in it or connected with it for imparting activity to the valve itself, it opposes its whole inert weight to the force of the wind, and thus, without especial care in primary regulation, it would not work at all. Third, when in operation it strikes the valve-seat a quick succession of forcible raps, and when at rest its whole weight lies on the seat, so that in a short time the facings become hard and the attachment useless.

The object of my invention, therefore, is, in brief, first, to provide means for producing a smooth, undulating, trembling tone, similar to that produced by the fan; second, to make an action that shall be unusually simple, cheap, sensitive, noiseless, and easy to adjust, and that shall be durable and thoroughly reliable.

It consists of a valve having an elastic hinge, and other peculiar parts, all of which, and every feature necessary to a proper understanding of my invention, are fully described in the following specification, of which the accompanying drawings form a part.

Figure 1 is a side view of a vertical section representing the valve and manner of mounting the same. Fig. 2 is a section through the middle of the valve, showing the manner in which the facings are fastened to it. Fig. 3 is a plan view of the valve as mounted on the upper board of the wind-chest.

A is the opening communicating with the wind-chest of a reed-organ. A' is the opening communicating with the reservoir. The valve B is mounted on a spring-hinge, C, which is fastened by one of its ends to the upper board D of the wind-chest by a screw. A slit is made in the other end of this spring-hinge C through which the regulating-wire E passes, and is prevented from moving sidewise. An eye is formed on one end of the regulating-wire E, through which and through the spring-

hinge C a screw passes into the valve B, and thus are these three parts held together. The valve B is covered with two facings—one of leather and one of cloth. Instead of gluing these facings to the valve, they are simply fastened to its center by a screw and washer. This provides a soft edge bearing. Additional precaution against pounding is taken by making the wood part of the valve B a little smaller than the hole over which it operates, and by permitting only a part of the overlapping facings to come in contact with the wood. This method could not be taken advantage of in the case of valves mounted in the ordinary way. The spring-hinge C is so adjusted that it holds the valve B slightly away from its seat; this is its normal position. When the air rushes through the opening A in the direction of the arrow, the valve B is forced open, but as the pressure becomes, on the instant, equal on both of its sides, it is driven to its seat or bed partly by its own weight and partly by the reaction of the spring-hinge C, so that its motions are not wholly dependent upon any conditions of wind-pressure, but are aided by the oscillatory movement of the

spring itself, which, when once started, will continue for some time independent of any wind action. The time of this oscillatory movement is determined by the position of the weight F on the regulating-wire E. The valve B is mounted directly on the wind-chest, and not on a separate board, as in ordinary cases. This, together with simplicity of construction, and the matter of easy adjustment, considerably lessens the expense of manufacture.

I claim as my invention—

In a reed-organ, the board D, having openings A A', and the tremolo-valve B, provided with cloth or other facing, in combination with the spring C and regulating-wire E F, all constructed and arranged substantially as and for the purpose described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

O. H. ARNO.

Witnesses:

JAS. H. SOUTHACK,
C. F. SOUTHACK.