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M. J. MATTHEWS.

REED-ORGAN.

No. 176,143. Patented April 18, 1876.

Fig. 1

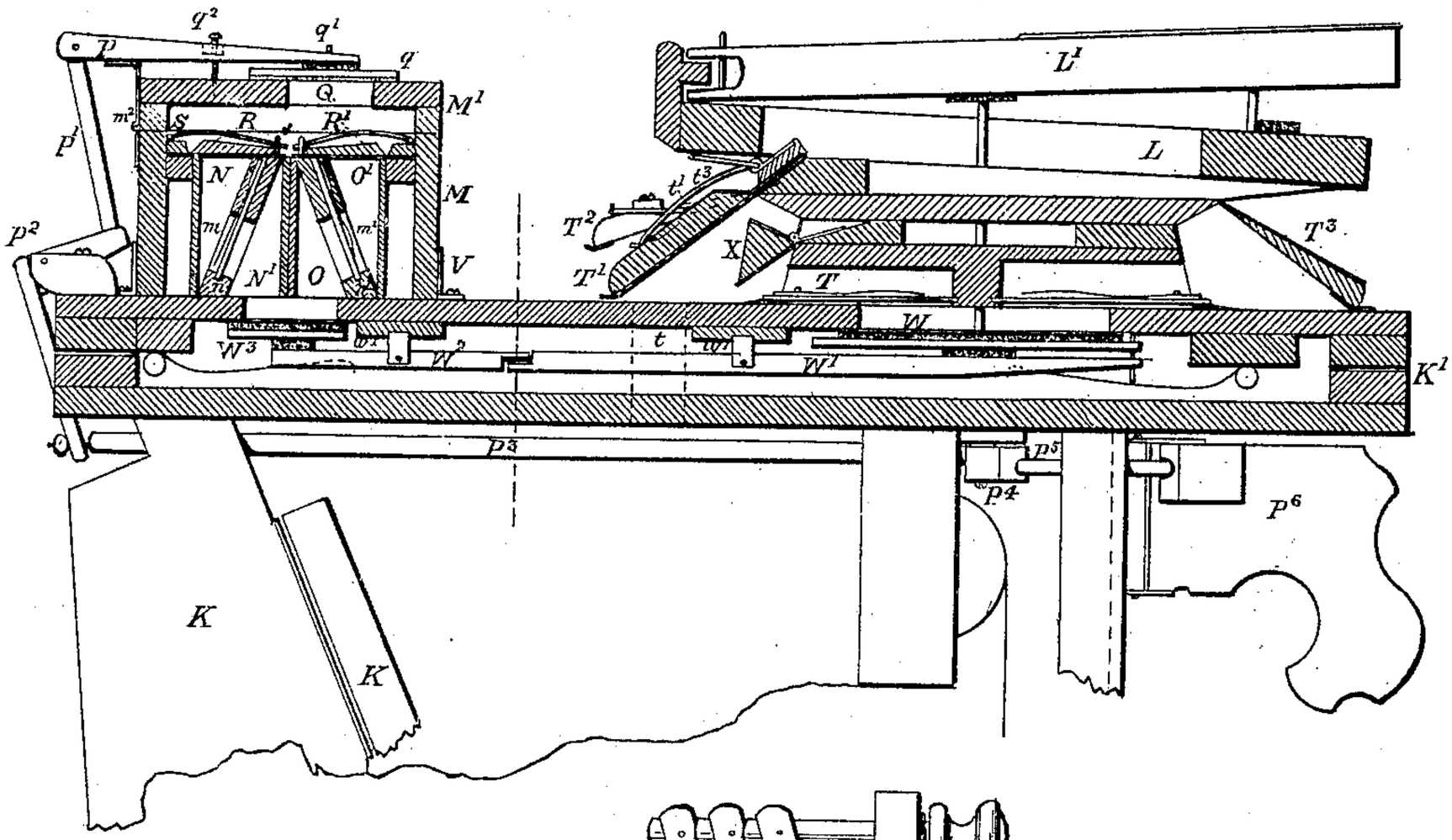


Fig. 2

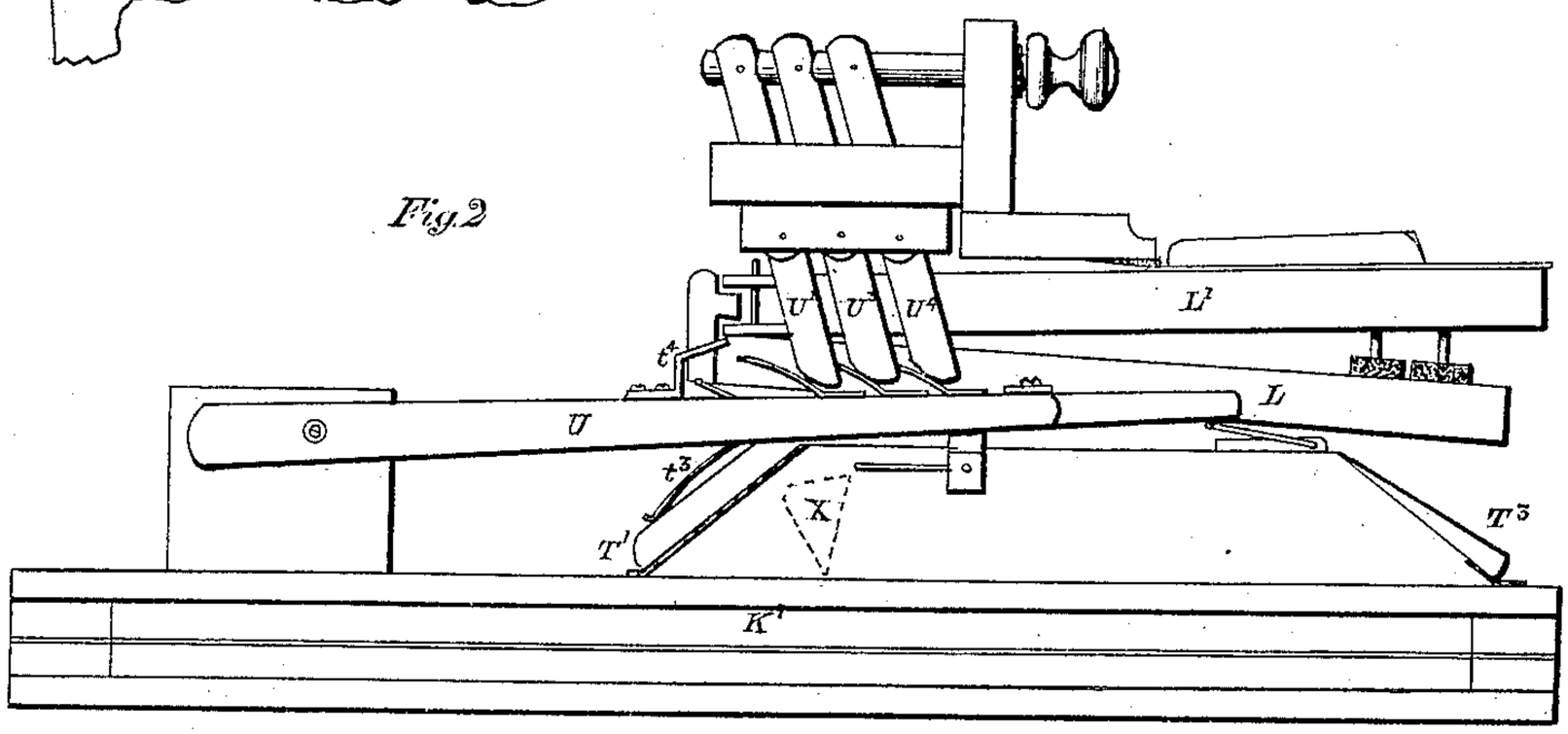
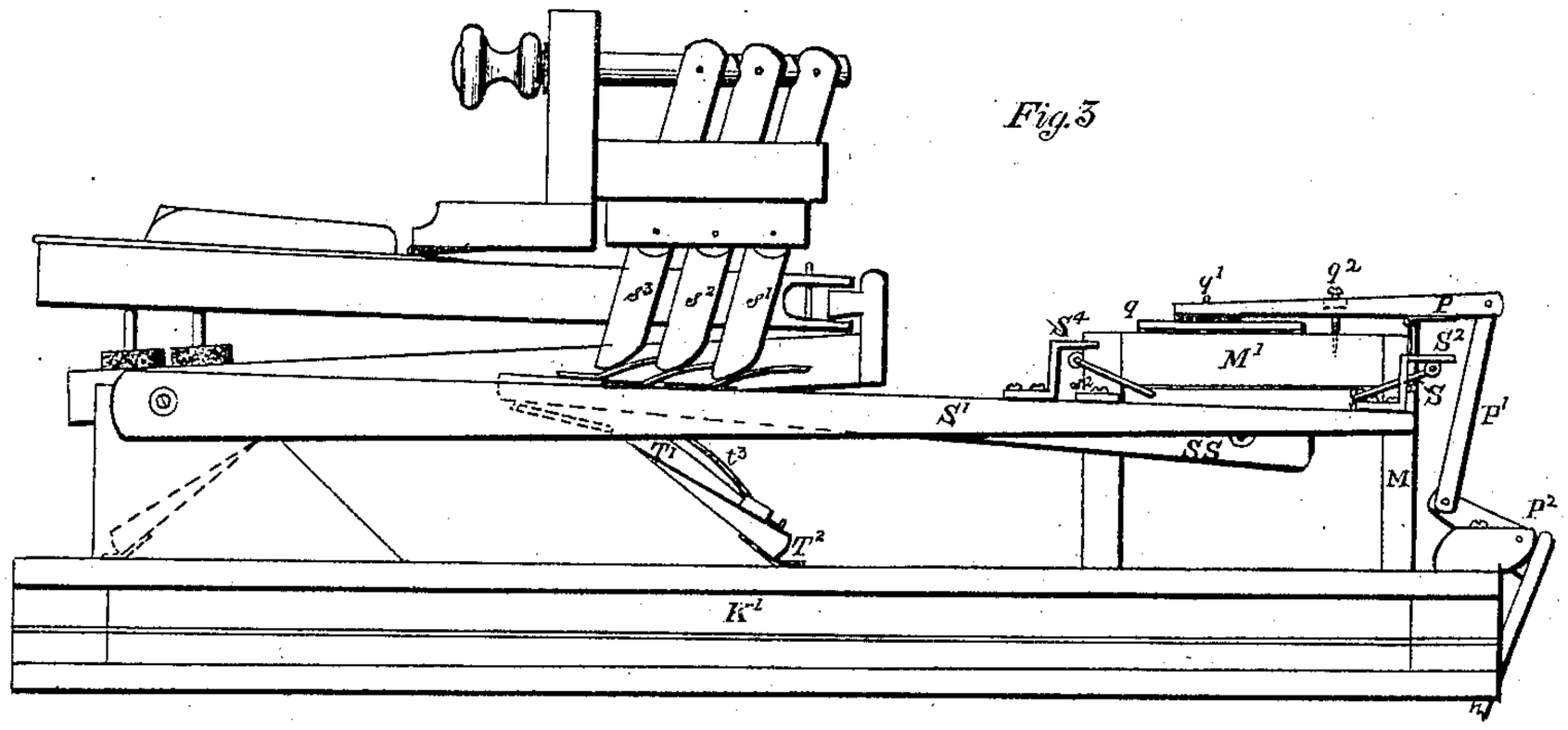


Fig. 3



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2 Sheets—Sheet 2.

M. J. MATTHEWS.

REED-ORGAN.

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Fig.6

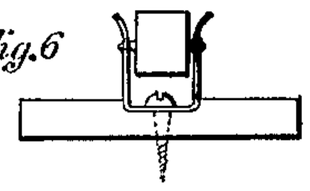


Fig.4

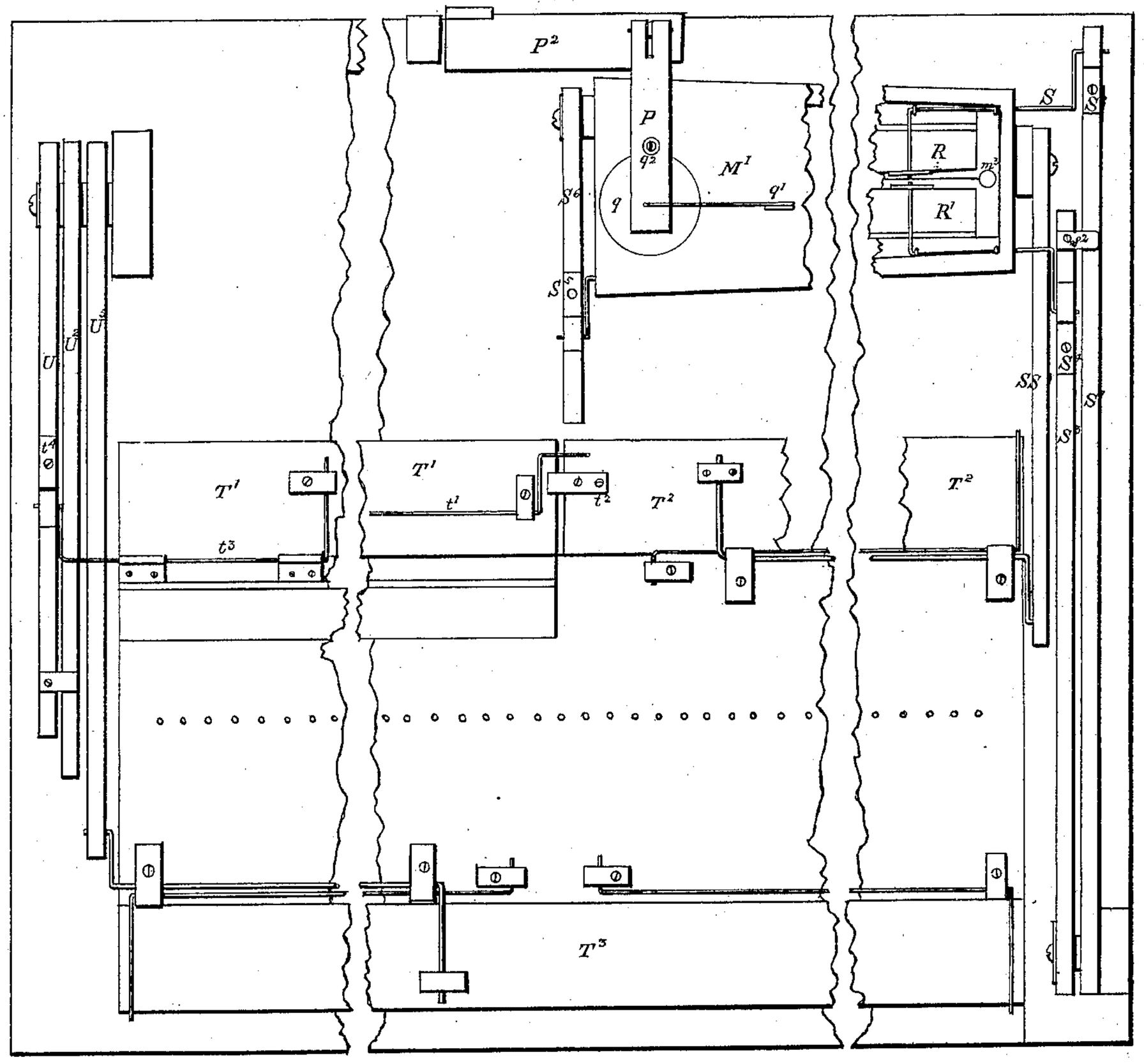
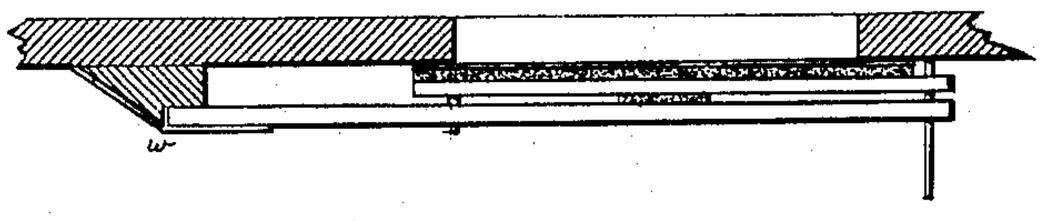


Fig.5



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UNITED STATES PATENT OFFICE.

MASON J. MATTHEWS, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN REED-ORGANS.

Specification forming part of Letters Patent No. **176,143,** dated April 18, 1876; application filed August 14, 1875.

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-organ mechanism of a peculiar kind, affording means for the production of novel solo, combination, and expression effects; and consists, first, of an improved reed-board or reed-chest, having cuneiform tubes and other novel features, rendering it capable, in combination with the reeds, of producing qualities of tone and varities of effect beyond the capacity of reed-organs of ordinary construction. It also relates to such an arrangement of levers and valves to operate the said cuneiform tube-board as to secure comparatively frictionless, perfect, and reliable action. Another part of my invention relates to novel means for producing a soft bass accompaniment, which shall be always available, and which, when in operation, shall be unaffected by the knee-swell. This arrangement consists of an action operated by a stop, which, when drawn, performs the double function of opening the valve over the reeds, and closing the lower or bass half of the swell at the same time, and in such a manner as to leave no vent for air to pass through thereby to the reeds. The air-current necessary to set the reeds in motion is brought up from the lower side of the wind-chest, from the inside of the body of the case into the swell-chamber, so that the sound-escape is carried as far away from the performer as is practicable. One object of this arrangement is to secure the softest tone possible without sacrificing promptness of speech.

That my invention may be fully understood I shall now proceed more particularly to describe the same, in doing which I shall refer to the accompanying drawings, which form a part of this specification.

Figure 1 is a sectional elevation representing the main parts of the instrument. The section of the front part of the figure is through by the lowest bass note. The section of the back part is through by the lowest note of the cuneiform chest, or about the center of the range of keys. Fig. 2 is a side elevation of the action, showing some of the stop-work at the bass end of the instrument. Fig. 3 is a side elevation, representing some of the stop-work which operates the valves in cuneiform chest at the treble end of the instrument. Fig. 4 is a plan view of the swells, (the keys being removed,) showing the manner in which they are divided and operated. Part of one swell-cover is represented as broken off, leaving one inside end of the cuneiform chest exposed, so that the stop-valve action is clearly seen. Fig. 5 is an enlarged view of the self-adjusting valve used by the Mason & Hamlin Organ Company. Fig. 6 is a full-sized representation of a brass flange-joint, with double-pointed center-pin.

The bellows K, wind-chest K′, key-frame L, and keys L′ are of ordinary construction, and need no description.

In describing the various parts I shall use the singular and plural numbers interchangeably, because, in the figures, sometimes only one of a series of members is shown, and because of other obvious reasons.

Mounted on the top of the wind-chest K′ is a reed-chest or tube-box, M. There are two sets of reeds, m m^1, in this tube-box M. Each reed is provided with two wedge-shaped tubes, N N′ and O O′. One of these tubes is on the outside of the reed, and serves the purpose of giving character to the tone and promptness to the speech. The other tube is on the inside of the reed, and serves the purpose, mainly, of directing the air-current to the wind-chest K′. The tubes N N′ and O O′ are made of pine, with the grain of the wood running perpendicularly, and are duplicates of each other. The pieces marked n n' are of hard wood, with the grain running horizontally.

The reeds m m^1 are inserted in grooves made in these pieces n n'. The wedge-pieces N N′ and O O′ are glued to these pieces n n'. The tube-chest thus constructed is glued into a swell-box, M, and is fastened to the wind-chest by means of screws passing through the metal pieces V. The upper part of this swell-box M is hinged at m^2, and forms a swell-lid, M′. This is faced with leather and is made to fit the box as closely as possible, so that, without other provision, the swell-chamber would be entirely air-tight, and consequently the reeds would not speak. To provide against

this and afford the necessary air-current, a hole, m^3, (see Fig. 4,) is bored through the upper inside end of the cuneiform chest; thence through the frame-work of the wind-chest to the interior of the case, where, when the swell-lid is closed, the sound is emitted. The object of this arrangement is to soften the tone without sacrificing promptness of speech, and also to give the sound a distant effect. The swell-lid M′ is held down by twist-springs, and is operated through the medium of the lever P, tracker-rod P^1, bracket-lever P^2, tracker-rod P^3, lever P^4, rod P^5, and knee-board P^6, which is arranged so as to be operated by the left knee. In order to prevent abruptness in the swell effect, an opening, Q, is made through the swell-lid. Attached to the lever P is a valve, q, which covers the opening Q. The valve q is held to its bed by means of a spring, q^1, of much less power than the twist-spring which closes the swell-lid M′. The lever P is hinged at the back of the swell-lid M′, so that in the movement of the swell the valve q rises in advance of the opening of the main swell-lid M′ until the lever P reaches the screw-head q^2, so that the sound-power can be emitted gradually. The stop-valves R R′ are placed one over each set of reeds m m^1. There are three stops connected with these valves. One of these stops opens the valve R, another opens the valve R′, and the third stop opens both valves R and R′ at once. The manner in which these stops operate is as follows: A wire lever, S, with transverse arms is mounted over the valve R. One of the arms of this lever S reaches over the valve R, and passes through a hole provided in a piece of wood, s, which is fastened to the edge of the valve R. The other arm is outside the swell-box M. (See Fig. 3.) The three wires connected with the valves R R′ are all about the same form. A long lever, S^1, is hinged to a block toward the front of the instrument. To the back end of this lever S^1 is screwed a piece of metal having the form of a double angle, S^2. When the lever S^1 is depressed by means of the corresponding stop-lever s^1, the outside arm of the transverse lever is also depressed by coming in contact with the under side of the upper arm of the double angle S^2. Along the inside of this lever S^1 is another and similar lever, S^3. This also has a double angle, S^4, screwed to it. It has a metal strip, s^2, attached to it, which reaches over the lever S^1, so that both the valves R and R′ are opened at the same time, and by one stop. This action is at the right-hand end of the instrument. A transverse wire similar to that described, and marked S, is connected with the lower or left-hand end of the cuneiform chest M, and is acted upon directly by the double angle S^5, which is attached to the lever S^6. (See Fig. 4.) Room enough is left between the upper arm of the double angle S^4 and the lever upon which it is mounted to admit of the independent action of the stop which opens only the valve R′. The lever S^3 is operated by the stop-draw lever s^2. The stop-draw lever s^3 operates the back swell through the medium of the lever S S. The reeds m^1 are voiced with all the bend and twist, and are left as thick as they will admit. They are tuned a little sharp of the normal pitch of the instrument. When the stop-valve R is used alone it is opened but a little, enough only to draw the pitch of the reeds down as low as is consistent with promptness of speech. The reeds m are thin and straight, and are tuned a very little flat—not so flat as the reeds m^1 are tuned sharp. When both valves R and R′ are operated together, the valve R′ is opened as wide as possible, so that the reeds m^1 will sound their sharpest.

The object of this whole arrangement relating to the reeds and valves is to secure, first, a sufficient variance of pitch of the two sets m and m^1 to produce, when they are sounding together as a double-set solo, a good and novel celeste or violin's effect, and yet have the pitch of each set, when used as a single-set solo, near enough the normal pitch of the instrument to provide against an out-of-tune disagreeable effect; and, second, to afford capacity for all the distinctness in character and variety of effect obtainable from two solo-sets of reeds.

Another novel feature of my invention is embraced in the means for producing a soft-bass accompaniment, so desirable in instruments having delicate treble solo-stops. The swell-lid to the back ordinary set of reeds T is divided into two halves, T^1 and T^2, each of which covers a separate swell-chamber, and may be counted as two swells—one for the bass and the other for the treble. The bass-lid T^1 is fitted as closely as possible, so that, when shut, there is no aperture for air to pass through to the swell-chamber, nor for the emission of sound from the upper side of the wind-chest K′. An opening (represented by dotted lines t, Fig. 1) is made from the swell-chamber through the frame-work of the wind-chest, and communicating with the inside of the body of the case. This opening t is similar to, and for the same purpose as, that described in connection with the cuneiform chest M. Mounted on the swell-lid T^1 is a twist-spring, t^1, bent in the form of a double angle, one arm of which reaches along the swell-lid T^1, and is fastened to it. The other arm reaches over the swell-lid T^2, so that, when this lid T^2 rises, the lid T^1 is caused to rise also, and thus an ordinary swell effect is produced. The lid T^2 is closed by means of a twist-spring similar to that in common use in reed-organs. The lid T^1, under ordinary conditions, is closed by the block t^2, which overlaps it. The swells T^1, T^2, and T^3 are all operated by one knee-board, which is toward the right of the instrument. A bent-wire lever, t^3, with one arm reaching across the swell-lid T^1, and another arm reaching under the double angle t^4, is mounted on hinges near the joint of the swell-lid T^1, so that, when the lever U is depressed

by the proper stop-draw through the medium of the lever U^1, the long arm of the wire lever t^3 is pressed firmly against the swell-lid T^1, so that it is unaffected by the action of the other swells. The swell T^2 can now be raised against the resistance of the wire twist-spring t^1, so that all the attainable power of the treble-reeds, both front and back, can be used while the bass remains soft. The stop connected with this swell closes the lid T^1 and opens the stop-valve X at the same time. This stop-valve X is shown as open in plain lines in Fig. 1, and as closed in dotted lines in Fig. 2. The lever U^2 in Fig. 4 is operated by the stop-lever U^3 in Fig. 5. The stop-draw lever U^4 operates the front swell T^3.

The valve and lever action W W^1 for operating the ordinary sets of reeds is similar to the patented self-adjusting valve action used by the Mason & Hamlin Organ Company, and represented on an enlarged scale in Fig. 5. Instead of the leather joint *w*, I use a spring brass flange-joint, *w'*. (Shown in full size in Fig. 6.) The lever W^1 reaches beyond the joint *w'*, and passes under one end of another lever, W^2, having also a flange-joint, *w'*. To the other end of the lever W^2 a valve, W^3, is attached. This valve operates the reeds *m* m^1 in the cuneiform chest M.

The drawing is sufficiently explicit to preclude the necessity for further description.

So far I have described only that particular method which I deem best for carrying out my invention. I am aware that both in the matter of the details of construction and the materials employed therein considerable variation might be made.

The tubes N N' and O O' might be made of bass-wood, or of any other wood, instead of pine. The cuneiform chest M might be placed in some other part of the instrument, and be operated by a different valve action. Instead of making the air-openings from either the cuneiform chest M or the swell-chamber of the soft bass reeds through the frame-work of the wind-chest, a block might be inserted in the wind-chest, through which the hole might be made; or this air-opening might be made to communicate with other parts of the instrument. All the parts described as made of metal might be made of wood. The reeds T might be softened by opening the stop-valve X only partially; but this affects unfavorably both the speech and the pitch of so large reeds.

I claim as my invention—

1. The cuneiform chest M, including the swell-cover M', when both are constructed substantially as and for the purpose set forth.

2. The cuneiform chest M, in combination with the valves R and R', as herein described, and for the purpose set forth.

3. The supplementary swell-valve *q*, in combination with the opening Q, communicating with the swell-chamber of the cuneiform chest M, substantially as and for the purpose set forth.

4. The means for operating the swell M', consisting of the parts marked P, P^1, P^2, P^3, P^4, and P^5, as herein set forth.

5. In combination with the cuneiform chest M, the valves R and R', when constructed and arranged to operate substantially as set forth.

6. The lever W^1, when mounted on the brass flange-joint *w'*, and having relation to the self-adjusting valve W, as described, in combination with the lever and valve W^2 and W^3, as and for the purpose specified.

7. The swell-valve T^1, in connection with the swell-valve T^2, hole *t*, spring t^1, block t^2, crank-wire t^3, and stop-valve X, in combination with the reeds T, substantially as and for the effect and purpose set forth.

8. The subject-matter of the preceding clause, (clause 7,) in combination with the cuneiform chest M, so that the solo effects educed from the reeds mounted therein shall have a soft bass accompaniment, as specified.

In testimony whereof I have hereunto set my hand.

MASON J. MATTHEWS.

Witnesses:

L. M. PALMER,

J. E. TROWBRIDGE.