

M. J. MATTHEWS.

Reed-Organs.

No. 157,850.

Patented Dec. 15, 1874.

Fig 1.

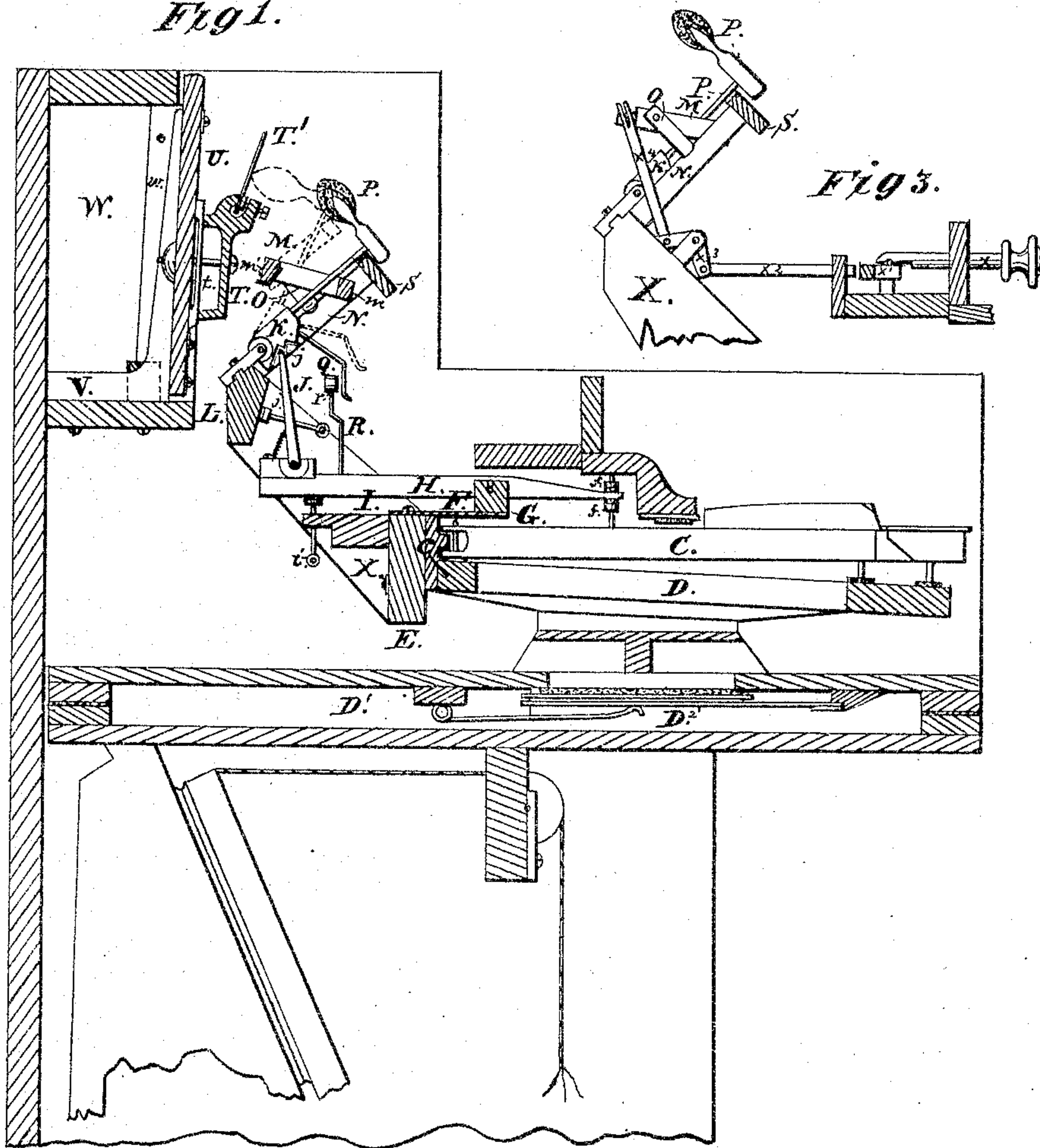
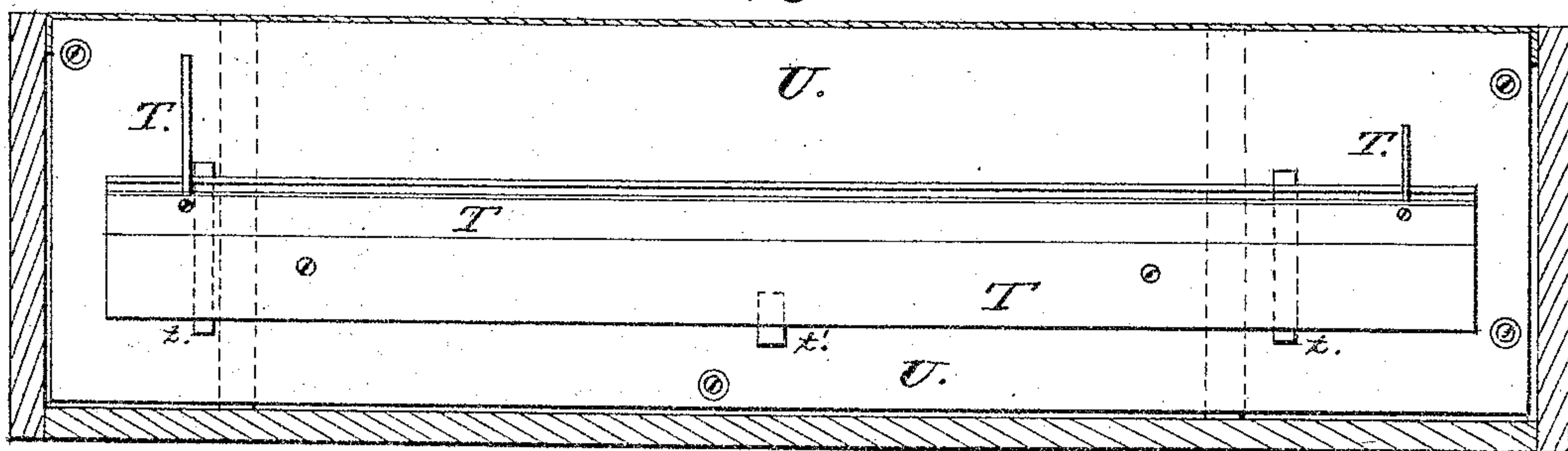


Fig 3.

Fig 2.



Witnesses:

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MASON J. MATTHEWS, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE
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IMPROVEMENT IN REED-ORGANS.

Specification forming part of Letters Patent No. **157,850**, dated December 15, 1874; application filed
June 18, 1874.

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 novel piano-forte or percussion and check action, together with simple and comparatively inexpensive means for the production of sounds resembling those elicited from the harp, and is intended to be used mainly as an attachment to reed instruments. It is made up of such parts, and in such form as to admit of easy application to reed-organs, without materially interfering with their general construction. It provides for the economizing and also for the utilizing of space. It is provided with the conditions of unusual simplicity, compactness, promptness of action, and reliability.

The following is a description of what I consider the best means of carrying out my invention.

The accompanying drawings form part of this specification.

Figure 1 is a sectional elevation, showing the main parts of the instrument. Fig. 2 is a front view of the resonance-box. Fig. 3 is an elevation, showing distinctly the stop-action.

The members of action connected with the several keys being duplicates of each other, only the parts forming the complete action of one key are fully described. The keys C, key-frame D, main wind-chest D¹, valve action D², and the bellows action below the main wind-chest, are all of ordinary construction, and need no description. Attached to the back of the key-frame D is a rail, E. On the top of this rail E is a metal platform, F, which reaches over the fulcrum-pin rail *c* of the keys, and supports, toward its front edge, a rail, G. This rail G has grooves cut across it, in which are mounted the sub-levers H. Lengthwise of this rail G is cut a saw-kerf, in which is inserted a wire. The sub-lever H being also provided with a saw-kerf, rests down on the wire, and thus is held in the position required. The front end of the sub-lever H is thin, and is provided with a slit, so that it will pass easily between the regulating-nuts

f. On the back end of this sub-lever H is mounted the jack J. The upper end of this jack J engages with the lip *j* in the hammer-butt K. The regulators *i*, mounted in the rail I, operate on the under side of the sub-lever H, for the purpose of raising or lowering the jack J, and determining its exact position in relation to the lip *j*. This provides against the necessity of resorting to the usual method of cutting or filing the parts for adjustment. In ordinary cases this means of regulation would be unavailable. It is valuable, for the purpose specified, only in combination with the sub-lever H. The regulator *j*, in the jack J, acts on the front or beveled face of the hammer-rail L. By this is obtained the lateral adjustment of the jack J in relation to the lip *j*. The check, consisting of the parts marked Q R *r*, is simple in construction. When the action is in its normal condition, the wire Q nearly touches the face of the check-head *r*. On the depression of the key C the check-head *r* and the wire Q rises and separates at the same time. On the escapement of the jack J from under the lip *j*, the hammer P falls in advance of the rising of the key C, and causes the check-wire Q to come in contact with the check-head *r*, thus preventing the rebound of the hammer P. Slightly in advance of the key C, regaining its normal position, the check-head *r* is released from the check-wire Q, leaving all the parts in condition for a repetition of the blow. The main rail E, the regulator-rail I, and the hammer-rail L, each supporting parts of the action, are held in their proper position by the pieces of wood marked X, one at each end. Thus, with the exception of the wire and nuts *f* mounted in the key C, all the parts of the action already described are connected together in compact form, and can be regulated and adjusted independently of the instrument to which the attachment is to be made. The provisions of this arrangement are important, inasmuch as they favorably affect the question of expense in the manufacture.

To the back of the main case of the instrument is attached a resonance-box, W. This box adds materially to the body and quality

of the tone. The sound-board U is graduated in thickness on the principle adopted in the piano-forte, and is mounted as follows: At each end of the resonance-box W, inside, a block, *w*, is fastened. These blocks *w* are not both in the same plane, but are so placed that when the sound-board U is fastened to them it shall be slightly twisted. On the sound-board U is mounted a metal casting, T. In this are mounted the tongues T'. The metal casting T is attached to the sound-board U as follows: The pieces of wood, marked *t*, half an inch, more or less, wide, are placed one at each end. Another piece of wood, *t'*, is placed under the lower side only of the plate. There are no bearings between the feet *t* on the upper side of the plate T, and only one bearing between them on the lower side. The screws binding the plate T upon these feet pass into the sound-board U. The number and arrangement of the screws used in mounting the board are shown in Fig. 2. The sound-board U is mounted so as to lean forward at the top. This is for the purpose of bringing the tongues T' near to the hammers P that strike them. These hammers P are so arranged that they shall have, when in motion, sufficient gravity to insure their falling to their bed, or hammer-drop S independently of the momentum given them by the blow upon the tongues T'.

Coupling and uncoupling of the action is effected by means of the frame M, which works on pivots in the pieces marked O. This frame M is sprung upward, in the position shown in dotted lines, by an ordinary twist-spring, which is fastened, one end in the back rail *m'* of the frame M and the other end in the pivot-stud O, so that the tension of the spring is felt on drawing the stop *x* instead of on being pushed in, and thus is uniform with the other stops. The members of action between and connected with the frame M and the stop-draw *x* are the lever *x*¹, the rod *x*², the bracket-lever *x*³, and the forked tracker *x*⁴, all clearly shown in Fig. 3. These pieces O are fastened in the pieces N, which, in turn, are fastened in and are supported by the pieces X. When the stop *x* is drawn the frame M is in the position shown in plain lines in Figs. 1 and 2, and admits of the required movement of the hammer-stem P' without contact between it and the rail *m* and *m'*. When the stop is in the frame M is in the position shown in dotted lines. The front rail *m* raises the hammer P and releases the lip *j* from the jack J, while the back rail *m'* presses on the back of the stems or hammer-shanks P', and insures that neither by the movement of the stop nor by any contact between the jack J and the lip *j* shall the hammers P be forced against the tongues T'.

So far this description has been confined mainly to what I consider the best method of carrying out my invention. Other means and materials might be used in working out the details, as, for instance, coupling and uncoupling might be effected by a provision for press-

ing the jacks J forward, so as to release them from the lip *j*. This plan would involve considerable friction.

To raise the hammers P without the rail *m*, or its equivalent, would be impracticable, because, on drawing the stop the hammers P would all strike the tongues T'. Besides, in this case, it would be needful that much expensive care should be taken to prevent the possibility of any collision between the jack J and the lip *j*; whereas by my arrangement, slight contact between these parts would be of no consequence, as it would be impossible to cause the hammers to strike the tongues.

The whole attachment, including the action, resonance-box, and the other parts, is constructed with a view to compactness, and so that there shall be no room taken up by it that is usually occupied by other attachments, including the vox humana or fan tremolo.

A horizontal action, or an ordinary upright piano-action or sub-action, below the keys, would interfere considerably with many important features commonly used in reed-organs. Besides, a passably successful application of these actions would render necessary serious changes on approved principles of construction in these instruments.

The platform F might be of wood, but this would occupy more room than metal; besides it would be liable to warp and cause derangement.

I claim as my invention—

1. The sub-levers H, when mounted above the keys C, and having a fulcrum in front of the pin-rail *c*, arranged relatively to the regulating-nuts *f*, jacks J, rail G, and supported on the platform F, substantially as and for the purpose specified.

2. The subject-matter of the above clause, in combination with a reed-organ, as set forth.

3. The check-wires Q and R, arranged relatively to each other, and to the sub-levers H, so that on the depression of the keys C, and the consequent elevation of the sub-levers H at the end bearing the jack J, the check-wire Q, will come in contact with the outer face of the check-head *r*, as herein set forth.

4. The subject-matter of the above clause, in combination with the keys C of a reed-organ, as set forth.

5. The adjusting-rail I, with the supplementary regulators *i*, mounted therein, in connection and combination with the sub-levers H, substantially as and for the purpose specified.

6. The coupling-frame marked M *m m'*, with the pieces N O supporting it, as and for the purpose specified.

7. The stop action, consisting of the parts marked *x x*¹ *x*² *x*³ *x*⁴, for the operation of the frame M, as specified.

8. The hammer-rail L, regulator-rail I, main rail E, together with the parts supported by each, all connected together by the pieces marked X, and constructed substantially as and for the purpose specified.

9. The percussion action attached to the back of the key-frame D, as described.

10. The resonance-box attached to the back of the case of a reed-organ, when said resonance-box has a sound-board mounted therein, as herein specified, for the purpose of intensifying musical tones educed from metal oscillators or vibrators.

11. The metal plate T, having along its upper edge a groove, the back of which forms a flat bearing-surface for one side of the reeds, said reeds being held rigidly in position by

means of screws passing through the front of the metal plate T to the metallic strip, which forms a bearing for the other side of the reeds, when constructed and arranged to operate as herein specified.

In testimony whereof I have hereunto set my hand this 16th day of June, 1874, in the presence of two subscribing witnesses.

MASON J. MATTHEWS.

Witnesses:

GEO. F. STONE,

GEORG F. EMERSON.