

(No Model.)

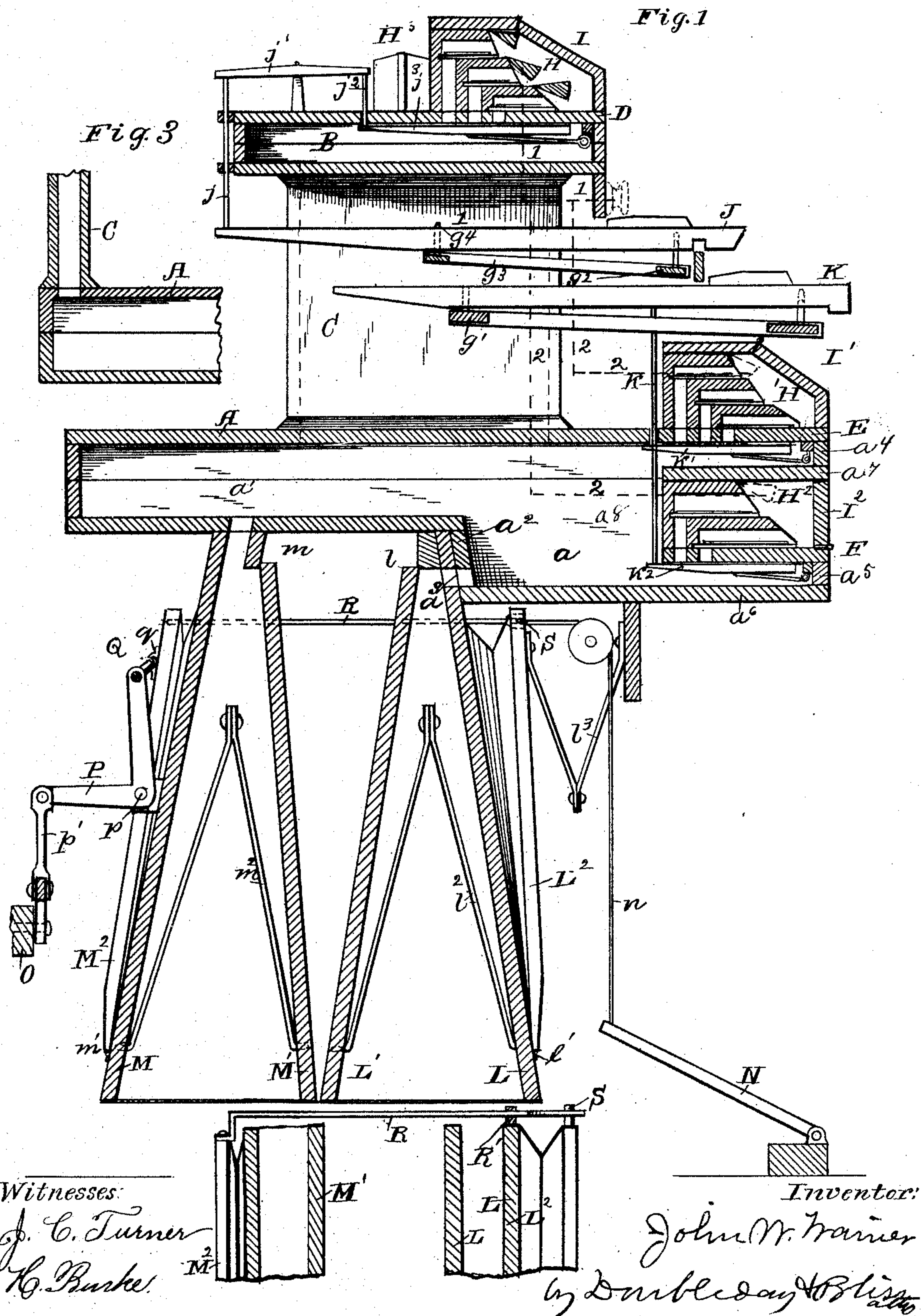
2 Sheets—Sheet 1.

J. W. TRAINER.

REED ORGAN.

No. 356,700.

Patented Jan. 25, 1887.



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Fig. 2

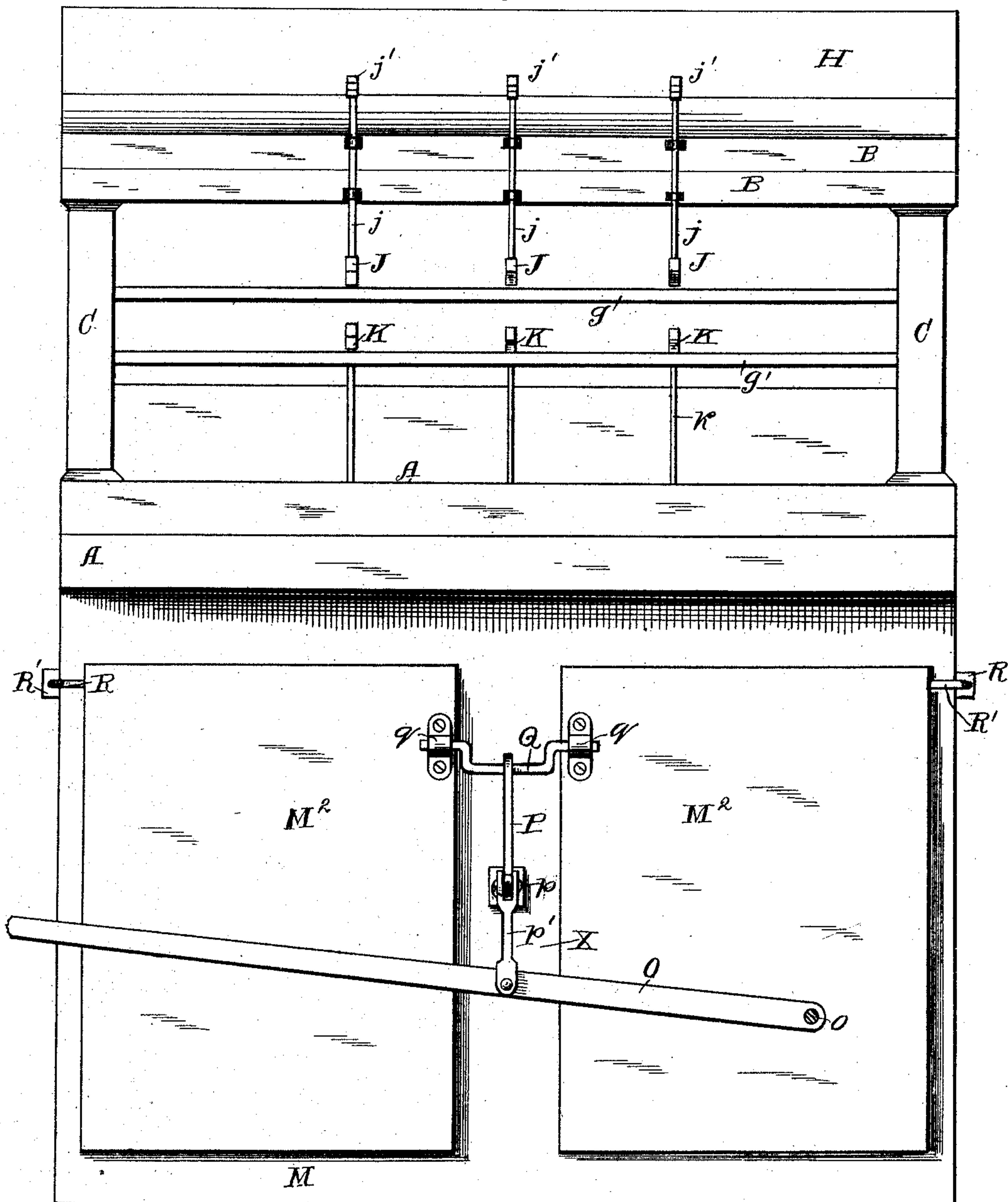
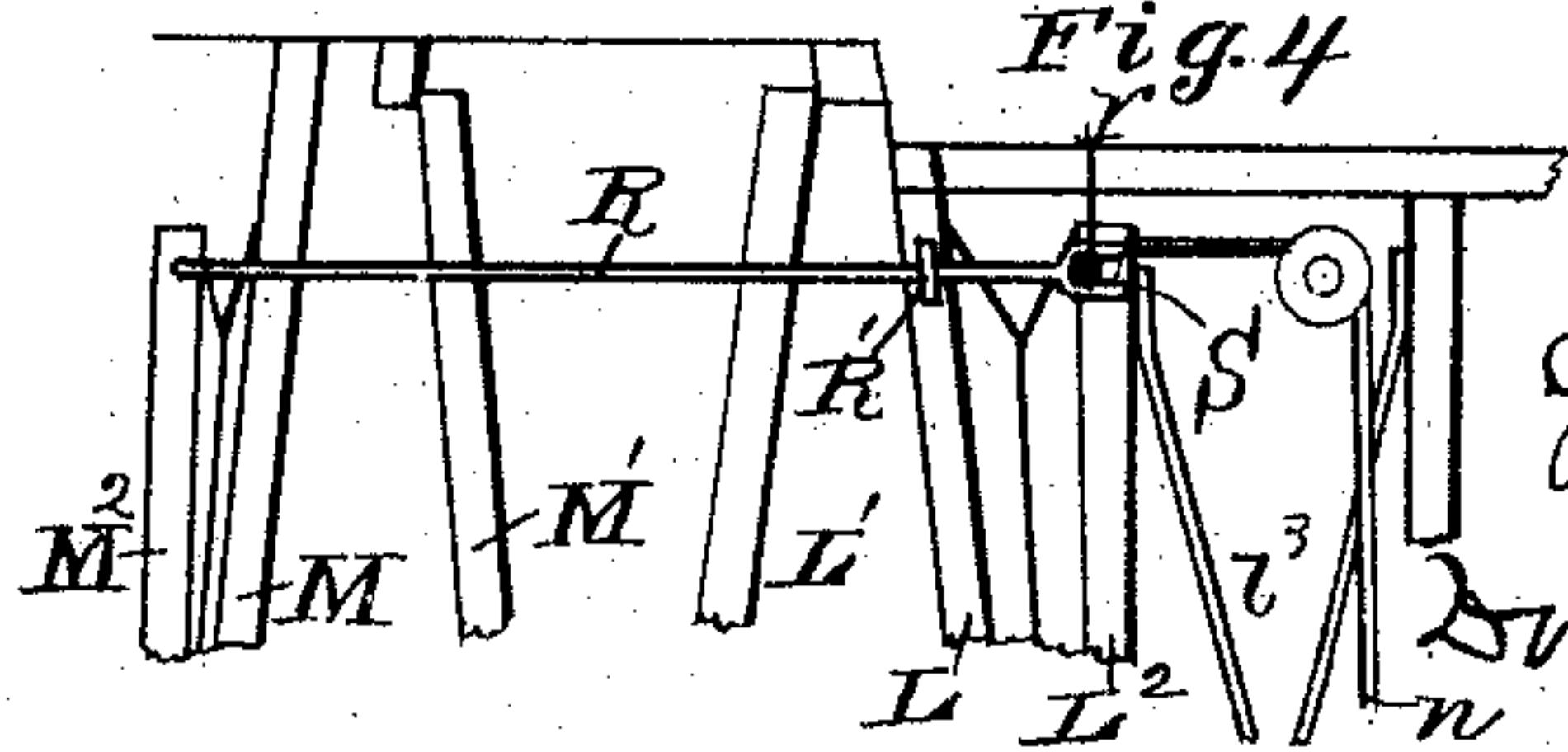


Fig. 4



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# UNITED STATES PATENT OFFICE.

JOHN W. TRAINER, OF FORT WAYNE, INDIANA.

## REED-ORGAN.

SPECIFICATION forming part of Letters Patent No. 356,700, dated January 25, 1887.

Application filed December 16, 1885. Serial No. 185,847. (No model.)

*To all whom it may concern.*

Be it known that I, JOHN W. TRAINER, a citizen of the United States, residing at Fort Wayne, in the county of Allen and State of Indiana, have invented certain new and useful Improvements in Organs, of which the following is a specification, reference being had therein to the accompanying drawings.

Figure 1 is a transverse vertical section of a part of an organ, sufficient to illustrate the features characterizing the present invention. Fig. 2 is a rear elevation of the same parts. Fig. 3 is a section of part of the wind-chest. Fig. 4 shows the devices for connecting together the two parts of the bellows mechanism.

One of the objects of this invention is to provide a reed-organ with its parts so constructed and arranged that it shall be possible to have two or more sets of keys and a corresponding increase in the sets of reeds without unduly enlarging the space occupied by the whole, and without lessening or impairing the suction, and at the same time have all of those parts easily accessible which most frequently require access for repairing, substituting, tuning, &c.

Another object of the invention is to so arrange one or more sets of reeds above the horizontal plane of a key-board and one or more sets of reeds below said plane that all of the mechanism which is used for bringing into play each and all of the sets of reeds shall be either below and behind the reeds or above and behind them, in order that there shall be convenient access to the reeds, for tuning, &c., without the necessity of removing any of the action mechanism, and without the necessity of inserting the hand or a tool into the spaces or chambers occupied by any part of said action mechanism.

The invention also relates to a novel construction and arrangement of the parts by which the air is drawn through the reeds, the purpose being to provide within a small space sufficient mechanism to give a copious amount of air to the reeds even when the largest number of the latter ordinarily required are in use.

The invention also relates to other matters, which will be fully understood from the description hereinbelow, together with the drawings.

The invention can be embodied in any of a large number of mechanisms, varying more or less in detail as to construction, dimensions, arrangement, &c. I have selected and in the drawings have shown that form which I at present prefer to use; but I do not wish to be limited to the details in the respects above indicated.

To those acquainted with the art to which the invention pertains it will be apparent that many of the parts ordinarily comprised in an organ of this character can be added to those shown in the drawings, they being omitted for the purpose of making more clear the matters which relate more essentially to the invention.

The various parts which constitute the chamber or chest into which the wind is drawn through the reeds are generally represented by A B C, the first being a horizontally-arranged chest, preferably situated somewhat below the plane of the keys, the second being another horizontally-arranged chest, preferably somewhat smaller than that at A, and above the plane of the keys, and the third, C C, being vertical trunks at the ends of the parts A and B. Preferably these latter, C C, rest upon and communicate with the top of the lower chest, A, and have their upper ends under and communicating with the bottom of the upper chest, B; but they can be varied as to position when occasion or preference may dictate. As shown, the lower chest, A, is at the front side somewhat deeper than at the rear, the parts of different depths being represented by  $a a'$ ; but this is not essential, and it may all be of one uniform depth. The top walls, D and E, of these chests A and B are the cell-boards for several sets of reed-cells; but other cell-boards can be used, if properly arranged and connected with the interiors of the chests. Thus at F there is shown a cell-board, and any desired number of such can be employed.

The various sets of reeds and cells in the drawings are generally represented by  $H H' H'' H'''$ , and it is not necessary herein to describe in detail the particular construction, as the parts shown, as well as those omitted, will be readily understood by those skilled in the art. There is, however, a peculiar arrangement of these relatively to the other parts of the organ,



which I have devised, and which will be more particularly set forth hereinafter.

I I' I<sup>2</sup> indicate swell-valves, which also may be of any ordinary or preferred style.

5 In order that the relative position of the parts may be understood, I have illustrated sufficient parts of the keys and the devices connecting them with the valves. As shown, there are two banks of keys, those of one being indicated by J and those of the other by K. Those of each bank are pivoted and guided in the ordinary manner by means of longitudinal bars  $g'$   $g''$  and connecting-bars  $g^3$ , carrying pins  $g^4$ , but instead of which any suitable support can be employed. The keys of the upper bank may be respectively connected with their valves in a way similar to that shown—that is, by push-rods  $j$ , levers  $j'$ , and trackers  $j^2$ , the whole constituting a mechanism which lies below, behind, and above the upper wind-chest, B, and the reeds of the upper sets. The keys K of the lower bank are shown as being connected with the valves of the lower reeds by means of a tracker-rod,  $k$ , which engages with the valves  $k'$   $k^2$ .

As above stated, it is not deemed necessary to illustrate and describe fully any particular construction of stop-action or coupler mechanism; but by means of the dotted lines 1 1 I have indicated generally the lines and spaces occupied by the parts which constitute the stop-action and the swell-action for the upper sets of reeds, and by similar dotted lines, 2 2, I have shown the positions occupied by the corresponding parts, combined with the lower sets, H' H<sup>2</sup>.

By an examination of Fig. 1 it will be seen that all of the reeds above the keys lie in front of or above the parts which constitute the various actions, and it will be also seen that the reeds which are below the keys lie either in front of or below the corresponding parts of the lower actions.

By having the cells situated in the manner I have shown I avoid entirely any interference by the action mechanism with the full sounding of the reeds.

The mouths of the reed-cells, it will be seen, all open in a direction away from the space or spaces occupied by the movable parts of the several actions, and hence the reeds are not only allowed to speak to their fullest power, but they can all be reached by the tuner without the slightest difficulty.

I herein allude to the cells as opening outward, by this meaning that, as above said, they open away from the spaces occupied by the operating parts. The reed-cells at H<sup>3</sup> open upward; but, nevertheless, they are similar to those at H and H', in that they do not open toward the interior parts of the organ.

I will now describe the devices by which I exhaust the air, and which are so constructed and arranged that I can, at option, greatly increase the wind-power of the organ; can employ two exhausters at once, or one, if sufficient.

L represents a partition-board of a bellows, having upon one side the leaf L' of a reservoir and upon the other the leaf L<sup>2</sup> of the exhauster. It is arranged to permit communication with the reservoir through an aperture,  $a^3$ , which aperture may be formed on horizontal lines, as shown, or vertical. The part L' is pivoted at  $l$ , and the part L<sup>2</sup> at  $l'$ , there being a spring,  $l^2$ , and a spring,  $l^3$ , operating in the usual way. Any of the well-known forms of bellows can be used, so far as concerns the details of the parts above referred to. By means of the pedals N and straps or cords  $n$  the leaf L<sup>2</sup> can be operated. A bellows mechanism of this ordinary character, however, is not sufficient to attain all the desirable ends when the upper parts of the organ are constructed and arranged in substantially the manner I have shown; hence I have combined therewith other parts of a bellows mechanism which can be brought into use when necessary; and such use would be required in order to successfully operate the sounding parts when two banks of keys are in use.

M represents the stationary board of the rear part of the bellows mechanism, there being swinging leaves M' M<sup>2</sup>, respectively hinged at  $m$   $m'$ , together with springs  $m^2$ , substantially similar in construction and operation to those above described.

O represents a pumper-lever, preferably secured in the ordinary manner by a pivot,  $o$ , to the rear of the casing.

P is a bell-lever, pivoted at  $p$  to the board M. One arm of this lever is flexibly connected with lever O by a link,  $p'$ , and the other arm is similarly connected to the exhauster-leaves M<sup>2</sup> by means of a crank-rod, Q, the axial parts of which are held in place by boxes or caps  $q$ .

The operation of these devices will be readily understood, and by means of them I have succeeded in operating a bellows mechanism much more easily than is the case with those now in use with which I am acquainted. The parts are strong and durable, there being nothing to stretch and wear out, like straps, cords, or equivalent means.

In order to operate both parts of the bellows mechanism simultaneously I connect the leaves M<sup>2</sup> with those at L<sup>2</sup>, so that as the former are caused to vibrate by the pumper mechanism they impart corresponding vibrations to the front exhauster.

The connection shown consists of rods or bars R, which are pivotally secured to the leaves M<sup>2</sup>, respectively, and bearing loosely against the leaves L<sup>2</sup> or attachments thereon suitable for the purpose—as, for instance, pins S—the rod being forked at the front end, as shown at  $r$ . At R' there is a guide, which supports the front part of the rod R. When the rear exhauster-leaf, M<sup>2</sup>, is moving forward, it pushes the leaf L<sup>2</sup> also forward, and when that at M<sup>2</sup> is returning the one at L<sup>2</sup> will be returned by spring  $l^3$ ; but it will be seen that the connection between the two exhausters is such



that the front one can be operated independently of the rear, inasmuch as the pedal N and strap n will draw the exhauster forward and the spring l<sup>3</sup> move it back without effecting any motion of the rod R.

It is well known that it is desirable to condense as much as possible the space occupied by the bellows mechanism as well as that occupied by some or all of the other parts, in order that the instruments shall be compact and easily portable, without crowding the movable parts to too great a degree. It is difficult to attain these ends with a single bellows mechanism of the ordinary character—as, for instance, one such as shown at L, L', L<sup>2</sup>—and at the same time have it of sufficient power to operate the reeds corresponding to two or more banks of keys. A single large bellows would be objectionable, first, because the dimensions of the bellows-chamber are not such as to permit the use of a large one embodying the ordinary features, and, secondly, because the whole of it would have to be operated at all times—that is to say, whether few or many of the reeds were being used. By employing two comparatively small bellows mechanisms and connecting them together in such way that the wind-power can be increased or diminished, I can utilize to advantage all of the aforesaid small space, and at the same time can use only part of said mechanism when but a part is necessary.

The front part of the lower wind trunk or chest, A, is inclosed by the boards or walls E, a<sup>6</sup>, a<sup>4</sup>, a<sup>7</sup>, a<sup>8</sup>, F, and a<sup>5</sup>, and it will be seen that I so arrange the lower cells (shown at H<sup>2</sup>) that they lie within the space generally surrounded by this part of the wind trunk or box, and in this respect the organ differs from the earlier ones with which I am acquainted.

I have shown and described some of the details which I at present prefer to employ; but it will be seen that use may be made of any of the now well-known forms of the parts necessary to carry out my invention.

Wind-chests having several divisions arranged in series vertically have been heretofore known, and with them some of the ends at which I aim can be accomplished. So, too, other ways of arranging the reed cells and boards are known, which can be substituted for the forms herein shown.

What I claim is—

1. In a reed-organ, the combination, with the wind-chest having the lower horizontal part, the upper horizontal part, and end connecting part, with an open space surrounded by the said parts of the wind-chest, of the upper set or sets of reeds mounted above the upper part of the wind-chest, the upper bank of keys mounted in the aforesaid open space, the key-action mechanism situated behind and above the upper part of the wind-chest, the lower sets of reeds, the lower bank of keys mounted within the aforesaid open space, and the tracker devices behind the lower reed-

cells, all of the reed-cells opening in a direction away from the action mechanism, substantially as and for the purposes set forth.

2. In a reed-organ, the combination, with the wind-chest having the parts A B C, of the upper sets of reeds mounted above the part B of the wind-chest and having downwardly-opening valves, the upper bank of keys mounted in the space surrounded by the parts of the wind-chest, valve-levers above the part B of the wind-chest, the lower sets of reeds and reed-cells, all opening away from the action mechanism and supported upon the lower part, A, of the wind-chest, the lower bank of keys, and the tracker devices situated behind all of the lower reed-cells, substantially as set forth.

3. The combination, with the keys, of the sets of reed-cells arranged in several superposed series, the wind-chest B, communicating with all of the said series, the tracker devices situated behind all of the aforesaid reed-cells, the latter all opening away from the action mechanism, the lower sets of reed-cells arranged in several superposed series, the lower wind-chest, A, connected with and supporting the last said reed-cells, the latter all opening away from the action mechanism, substantially as described.

4. The combination of the wind-chest having parts A B C, the keys arranged within the space surrounded by the wind-chest, the reed-cells above the keys arranged in several superposed series, all communicating with the part B of the wind-chest and all opening in a direction away from the action mechanism, and the sets of reeds below the keys arranged in several superposed series, all the series of cells communicating with the part A of the wind-chest and all opening away from the action mechanism, substantially as described.

5. In an organ having two banks of keys, the combination, with the wind-chest, of a two-part bellows mechanism, each part comprising an exhauster, the pedals N, for operating one of the said exhausters, and means, as described, supplemental to the pedals for operating both of the said exhausters simultaneously, said means being connected with the exhausters operated by the pedals, substantially as set forth.

6. The combination, with the two-part bellows mechanism, each part comprising an exhauster, of the pedals connected with one of the exhausters, mechanism, substantially as described, for operating the other exhauster, and connecting devices attached to the last said exhauster and detachably connected with the first aforesaid exhauster, as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN W. TRAINER.

Witnesses:

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M. P. CALLAN.