(No Model.) 2 Sheets—Sheet 1.

# J. H. CHASE.

## MECHANICAL MUSICAL INSTRUMENT.

No. 264,027. Patented Sept. 5, 1882.

Fig. 1.

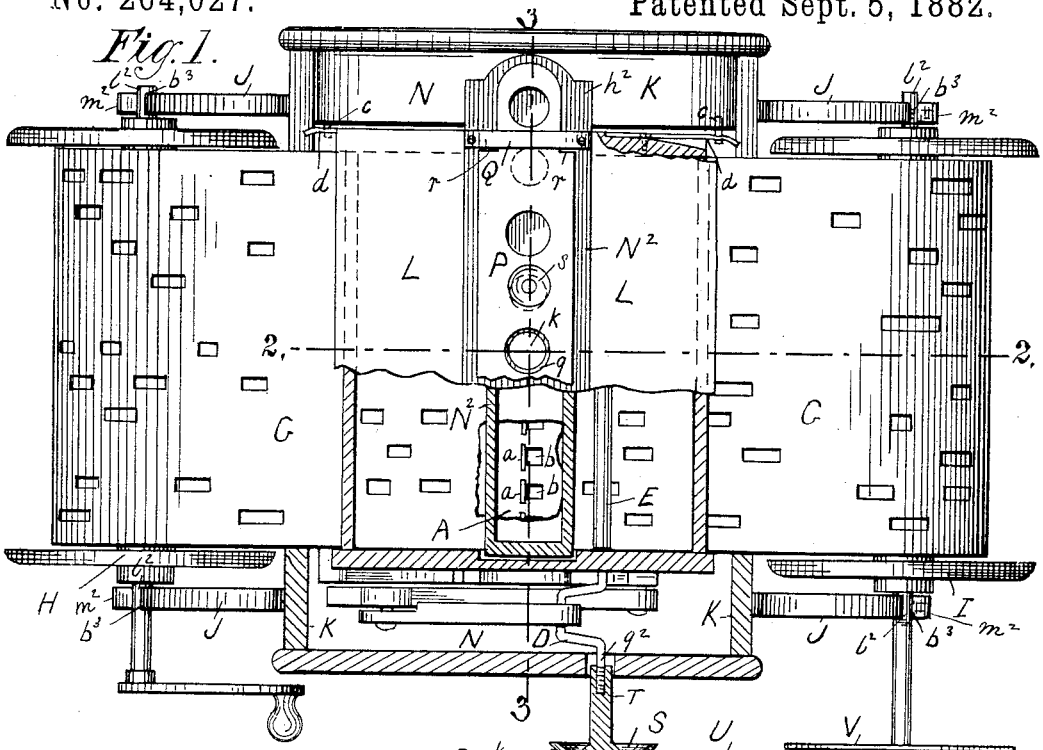
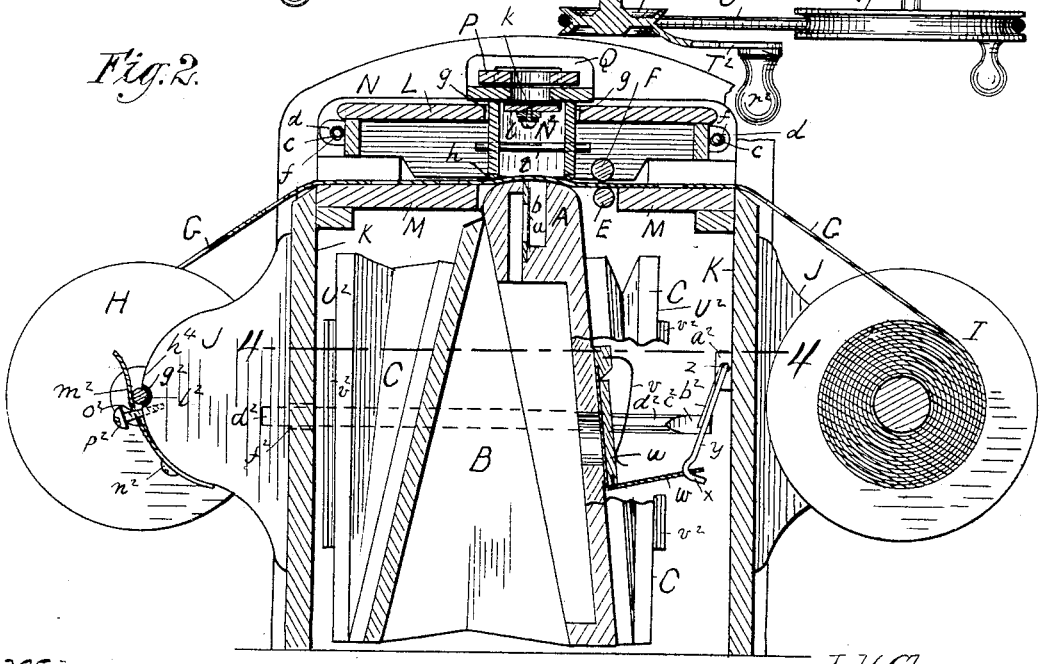


Fig. 2.



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(No Model.) 2 Sheets—Sheet 2.

# J. H. CHASE.

## MECHANICAL MUSICAL INSTRUMENT.

No. 264,027. Patented Sept. 5, 1882.

*Fig. 3.*

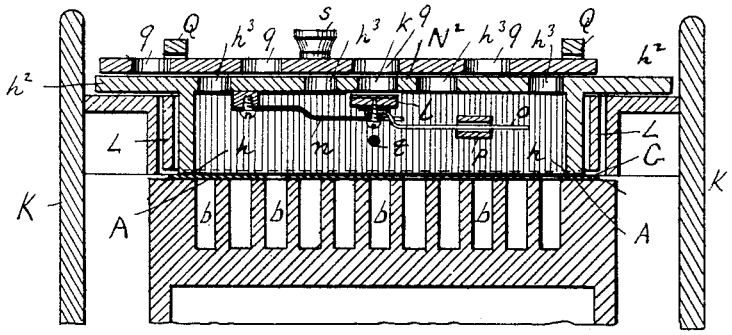
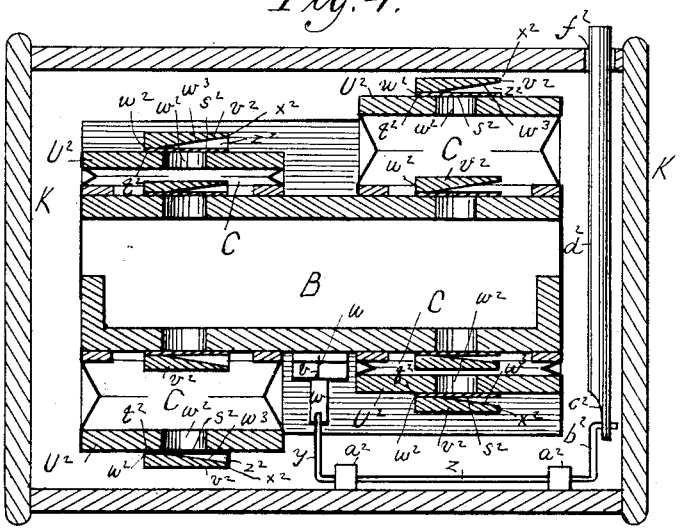


*Fig. 4.*



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# UNITED STATES PATENT OFFICE.

J. HERBERT CHASE, OF MONTREAL, QUEBEC, CANADA, ASSIGNOR TO WALTER F. ABBOT, OF NEW YORK, N. Y.

## MECHANICAL MUSICAL INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 264,027, dated September 5, 1882.

Application filed January 30, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, J. HERBERT CHASE, of Montreal, in the county of Montreal and Province of Quebec, and Dominion of Canada, have invented certain new and useful Improvements in Mechanical Musical Instruments, of which the following is a full, clear, and exact description.

This invention is designed more particularly for that class of mechanical musical instruments in which a music strip or band provided with perforations to represent the various notes of a tune is used as a valve or means to control the operation of the reeds or other sound-producing devices; and it more especially pertains to instruments of such class which contain sound-producing devices—such as reeds in separate chambers of a reed-board, bellows and exhausters, and mechanism for operating the same—a perforated music-strip, feed-rollers operated by mechanism for moving the music across and over the open ends of the reed-chambers, a roller for the music-strip, and a roller operated by mechanism for taking up the music-strip as it is unwound from the music-roller and moved across and over the reed-chambers—as, for instance, the instrument known to the trade and public under the name of the "orguinette," although, as will be apparent from the description hereinafter given, this invention in some of its features is adapted not only to other mechanical musical instruments of the class stated, but to all musical instruments using reeds, pipes, and other similar sounding devices and operated with air from either exhaust or force bellows.

This invention in substance consists, first, in the combination, with a reed-board and a perforated music-sheet, of a detachable swell chamber or box having its lower edge resting directly upon the music-sheet, above the open ends of the reed-chambers, to produce a close joint between the swell chamber or box and music-sheet, and means for opening and closing said swell chamber or box; second, in the combination, with a reed-board and a perforated music-sheet, of a detachable and attachable swell-chamber having the lower edges of its transverse side walls resting directly on the music-sheet, and means for operating the swell of said chamber; third, in the combination of a closed removable and replaceable box or chamber and means for detachably securing the same to the instrument with a tremulant valve arranged within said box or chamber to flutter with the passage of the air through the valve-opening of the instrument; fourth, in a tremulant valve arranged within a removable box or chamber to flutter with the passage of the air through the valve-opening of the instrument, and means by which it may be placed into and out of such operation; fifth, in a box or chamber resting on a perforated music-sheet and having arranged within it a tremulant valve to flutter with the passage of the air, said box or chamber being constructed with an aperture leading to said valve, and arranged to be closed and opened.

The invention further consists of certain other features, which will be fully hereinafter described, and pointed out in the claims.

In the accompanying plates of drawings the present invention is illustrated in connection with an "orguinette" so called, and in Plate 1, Figure 1 is in part a plan and a horizontal sectional view of a mechanical musical instrument—such as the orguinette—having the present invention applied thereto; and Fig. 2 is a vertical longitudinal section on line 2 2, Fig. 1, but showing one end of the music-roller and its support in elevation. In Plate 2, Fig. 3 is a vertical section on line 3 3, Fig. 1, along the length of the swell-box and reed-board, and through its reed-chambers to the chamber of the bellows, and across the perforated music-strip. Fig. 4 is a horizontal section on line 4 4, Fig. 2.

In the drawings, *a* is a reed in a series of reeds, and each reed is located in a separate reed-chamber, *b*, of a common reed-board, A.

B is the bellows, having exhaust-bellows C arranged in pairs upon each side thereof, and severally, as heretofore, to be operated by mechanism connected to a common crank-arm, D, of one, E, of the feed-rollers E F.

G is the perforated music-strip.

H is the music-roller, and I is the take-up roller for the music-strip, each suspended in bearings $b^3$ of brackets J of the case or cabinet K, and located at opposite ends of said

cabinet K, and all as well known and common in the "orguinette," so-called, except in the respects to be hereinafter explained.

L is a frame or boxing which covers the upper board, M, of the instrument, along and over which the music-strip passes from the music-roller H to the take-up roller I. This frame L is attached to the cabinet K in any suitable manner, to be put in position and removed at pleasure, and it carries one, F, of the feed-rollers E F. The attachment of this frame L, as shown, consists in one part of four pins, *c*, each of which projects horizontally, but all in the same plane, from the inner surface of the side uprights, N, of the cabinet, each upright N having two pins, and those of the one directly opposite those of the other. The other part of the attachment of the frame L consists of four spring-arms, *d d*, which are attached to the ends of the frame L, two to each end, each arm having a hole, *f*, near its free end. These several arms *d* are situated and arranged on the frame to fit by their holes *f* over the projecting pins *c* of the cabinets, and for the frame to be released and removed from the pins and for the frames to be swung upon either two of the pins situated directly opposite to each other, first having released the frame from the other two pins.

The boxing or frame L has a rectangular-shaped slot, *g*, running from end to end, and in a direction at right angles to the travel of the music-strip, over the board M and over the open ends of the reed-chambers *b* in the reed-board A. This slot *g* is directly over the open ends of the reed-chambers, and the reed-board at the open ends of its reed-chambers projects, as usual, slightly above the rest-board M, and in such projection it is convex or rounding in the direction of the travel of the perforated music-strip G over it.

$N^2$ is a rectangular swell-box loosely fitting the rectangular slot *g* of the frame L, and resting at, along, and around its lower edges, *h*, where it is open upon the perforated music-strip at and along each side of the open ends of the reed-chambers and at each end of the reed-board. These lower edges *h* may have a strip of rubber or of other material suitable to secure a close joint between such edges and the perforated music-strip in their rest thereon. The swell-box $N^2$ outside and above the frame L has flanges $h^2$, by which to rest upon the top of the frame about the slot *g*, when the frame L is lifted from its position in the instrument, and it also has a series of apertures, $h^3$, in its upper wall or side and a similar aperture, *k*, midway between two of the apertures $h^3$. The apertures $h^3$ are the swell-apertures.

At and opposite the intermediate aperture, *k*, of the swell-box $N^2$ is located a light valve, *l*, attached to the outer and free end of a light spring-arm, *n*, running lengthwise of the swell-box and secured at its other end thereto. *o* is a light spring-arm, which projects from the valve *l* along the length of the swell-box, in continuation of the spring-arm *n*, and carries a small lead or other weight, *p*, arranged to be adjusted to and fro thereon to regulate the vibrations of the valve. This valve *l*, to be called hereinafter the "tremulant" or "tremolo," by its arrangement and the construction of its parts of suspension and attachment described, is free to flutter within the swell-box when the aperture *k* of the swell-box, at which it is arranged, is open for the passage of air through it to or from the reeds, according as exhaust or force bellows are used, as and for a purpose which will hereinafter fully appear.

P is a board or strip arranged to slide across the swell and tremulant apertures $h^3$ *k*, and along the length of the swell-box, and through transverse guide-blocks Q at each end of said box. This slide-strip has a series of apertures, *q*, similar to the swell-apertures $h^3$ and at similar distances apart. These two sets of apertures $h^3$ *q* are relatively arranged to secure, by a slide of the slide-board P in one direction, an opening of the swell-apertures $h^3$, and in the other direction a closing of the same, and to secure, when the swell-apertures $h^3$ are opened, a close of the aperture *k*, at which the fluttering valve *l* or tremulant is located, and when the swell-apertures are closed an opening of said aperture *k*. To insure this relative opening and closing of the swell-apertures and of the aperture *k* at the tremulant valve *l*, above described, the slide-board has shoulders *r* at each end, making abutments or stops to the movement of the slide-board P in the opposite directions stated, and so as to secure the relative opening and closing of the swell-apertures $h^3$ and tremulant-valve aperture *k*, as described.

The slide-board P has a knob, *s*, for convenience in manipulating it, as described, and the swell-box $N^2$ has a pin, *t*, across its width, and projecting at each side thereof, for holding the swell-box against accidental escape from the frame L when such frame is being handled either to attach or to remove it, or otherwise.

With a construction and arrangement of the swell-box above described it is plain that the air can pass to the reeds only through such box, entering at the swell-apertures $h^3$ when they are open, and at the aperture *k*, at which the tremulant valve *l* is located, when that is open; that the opening of the swell-apertures increases and their closing decreases the sound of the reeds by correspondingly varying the volume of air passing to the reeds through the swell-box, and thus swell effects are secured, and that when the aperture *k* is opened the flutter of the valve or tremulant located thereat produces a variation in the volume of air passing to the reeds, thus securing tremolo or tremulant sounds therefrom. Again, this swell-box improves the quality of tone and rounds off the "twang" so common to reeds in this class of instrument, and it also acts as a resonant chamber.

*u* is the safety-valve of the bellows B. This valve is arranged to open against a bent spring, *v*, and to close with such spring, as usual.

*w* is a flexible band, at one end fastened to

the lower or free end of the safety-valve $u$ and at the other end suspended to a hook, $x$, at the outer end of a crank-arm, $y$, at one end of a horizontal rod, $z$, which is arranged to turn in stationary bearing-blocks $a^2$ of the cabinet K, and at its other end has another and similar crank-arm, $b^2$, hung at its outer end to the inner end, $c^2$, of a pusher-rod, $d^2$, which projects and is arranged to move through a guide-opening, $f^2$, in the cabinet K.

A safety-valve, $u$, to the bellows B, arranged as described, it is plain, can be opened to admit air to the bellows from the outside of the instrument and independently of the ordinary play of the valve from the movement of the bellows produced by the operating mechanism for the exhaust-bellows C. By this admission of air the pressure upon the bellows B is relieved, and if so admitted when the blank portion of a perforated music strip is passing over the reed-chambers—as, for instance, at the end of a tune or between any two tunes of the music-strip—it obviously will prevent any undue strain and pressure upon the bellows and other parts connected therewith from the then continued operation of them under the rotation of the feed-roller to which they are connected to feed the music-strip along, and, furthermore, any unpleasant and disagreeable snarl of sounds from the reeds when the music-strip has passed completely through; and, again, such means can be employed to advantage to produce swell effects, for the reason that the valve, when opened as described, causes a diversion of the air from the reeds.

The bearings $b^3$ for the music and take-up rollers H I, as before stated, are in brackets J of the cabinet. Each bearing $b^3$ is composed in one part of a seat, $g^2$, which is in the edge $h^4$ of the bracket, and is of suitable shape to fit the journal $l^2$ of the roller and to partially surround it, and in the other part of a spring-arm, $m^2$, which is secured by screws $n^2$ or other suitable fastening devices to said edge $h^4$ of the bracket, and is located in a position to bear upon the journal $l^2$ on its side opposite to that which is in the bracket-seat $g^2$, and otherwise it is arranged to yield to the pressure of the journal against it, and as it so yields it moves by its opening $o^2$ over the shank of a headed screw-pin, $p^2$, suitably attached therefor to the bracket edge $h^4$. These spring bearing-arms $m^2$ for the music and take-up rollers prevent rattling of the roller-journals in their bearings, allow the rollers to be easily and readily placed in and removed from position, and by the adjustment of the headed screw-pins $p^2$ the roller-journals can be made secure against movement to such an extent as to endanger the retention of the rollers in their bearings when the instrument is in operation.

S is a pulley-wheel having a hollow screw-threaded hub, T, by which to screw it to the screw-threaded end of the journal $q^2$ to feed-roller E.

$T^2$ is a crank-arm to the pulley-wheel S, and it is made of one piece of metal or other suitable material with said wheel. The pulley-wheel S is connected, as usual, through an endless belt, U, to a pulley-wheel, V, of the take-up roller I, and its crank-arm $T^2$ has a knob or handle, $r^2$, for convenience in operating it.

A pulley-wheel, S, and crank-arm $T^2$, made in one piece, as described, obviously is inexpensive in construction, and the pulley cannot possibly become detached from the crank, and vice versa, and as a whole it is most convenient and practical for use in mechanical musical instruments.

$s^2$ is a valve of each exhaust-bellows C, all of which in their operation open outwardly. Each valve $s^2$ is made of a strip of leather or other suitable flexible material, and it is secured with tacks or other suitable fastening devices at and along one edge, $t^2$, together with one edge, $u^2$, of a fender, $v^2$, made of wood or of other suitable material, to the outer face of the side or board $U^2$ of the exhaust-bellows C. The valve $s^2$ is of suitable size to more than cover and to have a seat at and about the air passage or passages $w^2$ in the bellows-board $U^2$, and leading into the bellows. The fender $v^2$ is outside of the valve, and it is of a size to substantially cover the valve in its length and width. The fender, in its inner face, $w^3$—that is, its face toward the valve $s^2$—and from its confined edge $w^2$ in a direction toward and preferably to its unconfined opposite edge $x^2$, is made with a bevel, (see Fig. 4,) thus giving an open space, $z^2$, between the inner face, $w^3$, of the fender and the outer face of the valve $s^2$, with the valve on its seat, which space is to be made sufficient for the proper play of the valve at its free and unconfined portion to and from its seat on the bellows. The fender is also open at and along all of its edge except at that edge attached to the bellows, as aforesaid, which, with the space $z^2$ aforesaid, affords ample opportunity for the circulation of air desired.

A flexible valve, $s^2$, secured at one edge and covered by a fender, $v^2$, as described, obviously is free to move as required. It is always in position to act instantly on the slightest change in direction or degree of pressure of air. Its expansion and contraction from atmospheric changes are free to occur without detriment to its efficiency. It is not liable in operation to wrinkle or buckle. It is always in position by the pneumatic pressure to secure a perfect and close seat against the bellows. It is quiet in operation. It can be made of quite thin and very flexible or pliable material.

I do not herein claim the valve for the bellows composed of a flexible strip secured at one edge and a fender which covers the strip secured at one edge and beveled to provide an open space between it and the strip, as such features will constitute the subject-matter of a separate application for Letters Patent; nor do I herein claim the combination, in a mechanical musical instrument, of a removable lid having an opening and a box or chamber adapted to be placed and retained in said opening by

suitable devices to prevent its accidental escape in handling the lid, as such constitutes the subject-matter of a separate application for Letters Patent.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a mechanical musical instrument, the combination, with the reed-board and the perforated music-sheet, of a detachable swell chamber or box having its lower edge resting directly upon the music-sheet on the reed-board and above the open ends of the reed-chambers, to produce a close joint between the swell chamber or box and music-sheet, and means for opening and closing said swell chamber or box, substantially as described.

2. In a mechanical musical instrument, the combination, substantially as hereinbefore described, of a reed-board, a perforated music-sheet arranged to travel over the same, and a removable and replaceable swell-chamber provided with means for operating its swell and having the lower edges of its transverse side walls resting directly on the music-sheet, to produce practically a close joint between such lower edges of the swell-chamber and the music-sheet, for the purposes set forth.

3. The combination, with a mechanical musical instrument, of a closed removable and replaceable box or chamber and means for detachably securing the same to the instrument with a tremulant valve, *l*, arranged within said box or chamber, to flutter with the passage of the air through the valve-opening of the instrument, substantially as described.

4. In a mechanical musical instrument, a tremulant valve arranged within a removable box or chamber, to flutter with the passage of the air through the valve-opening of the instrument, and means by which it may be placed into and out of such operation, all substantially as described, for the purpose specified.

5. In a mechanical musical instrument, a box or chamber resting on the perforated music-sheet, having arranged within it a tremulant valve to flutter with the passage of the air, and constructed with an aperture leading to said valve, arranged to be closed and opened, substantially as described, for the purpose specified.

6. In a mechanical musical instrument, a removable and replaceable box or chamber having within it a tremulant valve suspended by a spring, to flutter with the passage of the air, and means, substantially as described, for opening and closing apertures in the box or chamber to produce tremulant or swell effects at different times, essentially as set forth.

7. In a mechanical musical instrument, the frame L, constructed to be attached to and detached from the instrument, and provided with a box or chamber having its lower edge resting directly on the perforated music-sheet above the reed-board, in combination with means for producing tremulant effects in said box or chamber, substantially as described.

8. In a mechanical musical instrument, the combination of a reed-board, a perforated music-sheet arranged to travel over the same, a detachable and attachable box or chamber resting on the music-sheet, and means within said box or chamber to produce tremulant effects, substantially as described.

9. In a mechanical musical instrument, the combination, with a bellows, &c., of a valve arranged to act as a relief thereto, of mechanism composed of a pusher-pin, $d^2$, crank-arm *y*, having a flexible connection, *w*, with valve, all substantially as described, for the purpose specified.

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

J. HERBERT CHASE.

Witnesses:
THOS. D. GIBSON,
H. L. RANDALL.