

Sheet 1-4, Sheets.

R. Nutting, 2d.,

Reed Organ,

No 5,438,

Patented Feb. 8, 1848.

Fig. 1.

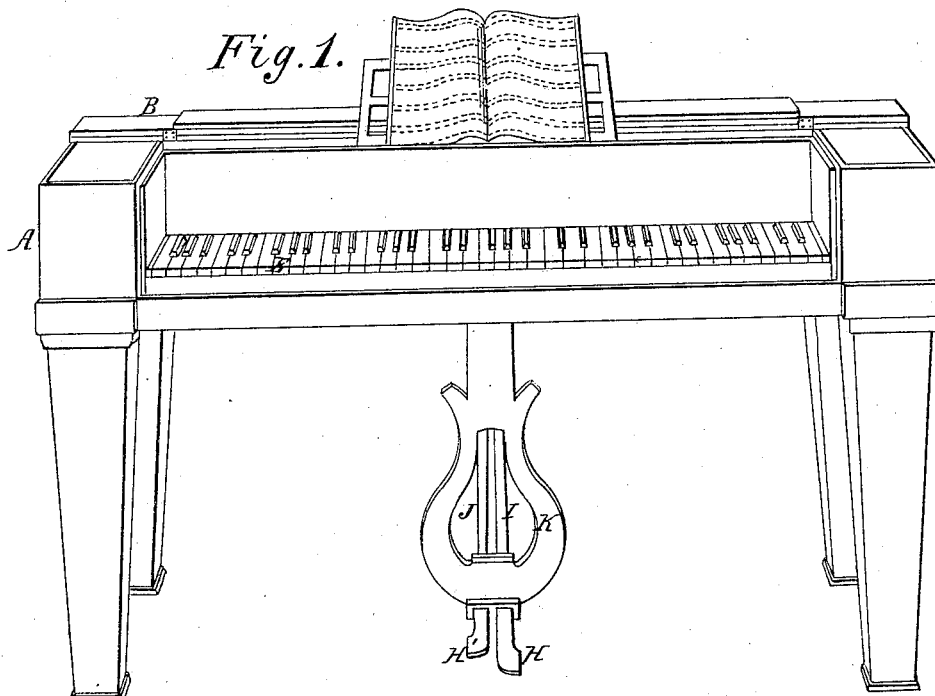
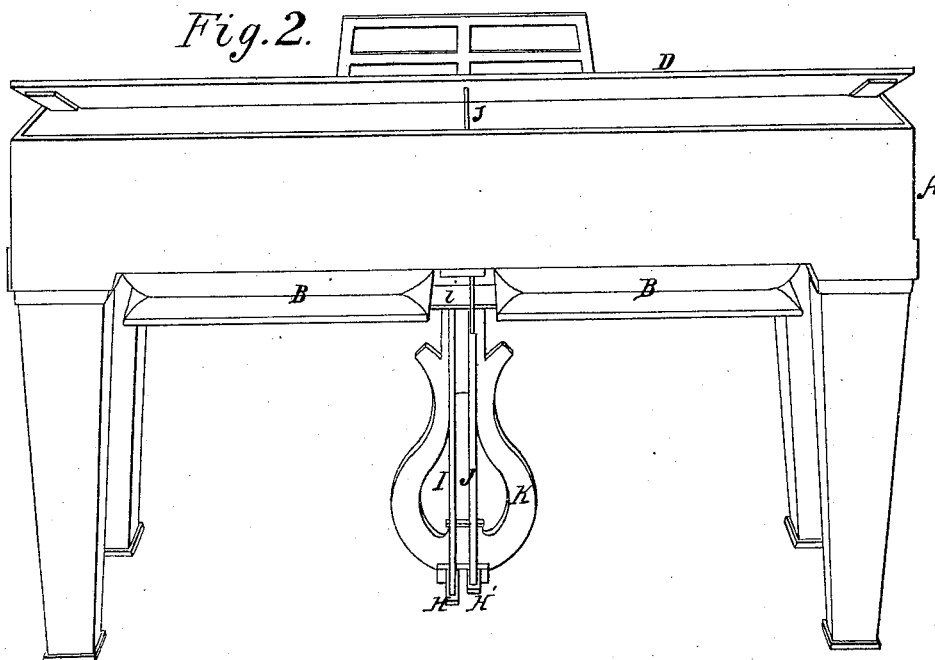


Fig. 2.



R. Mitting, 2d,

Reed Organ,

No. 5,438,

Fig. 3.

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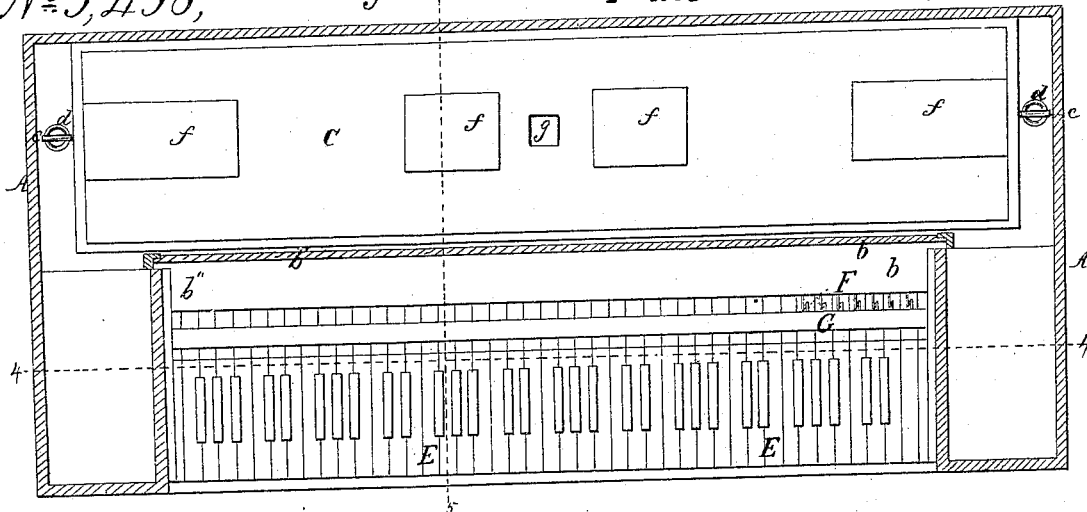


Fig. 4.

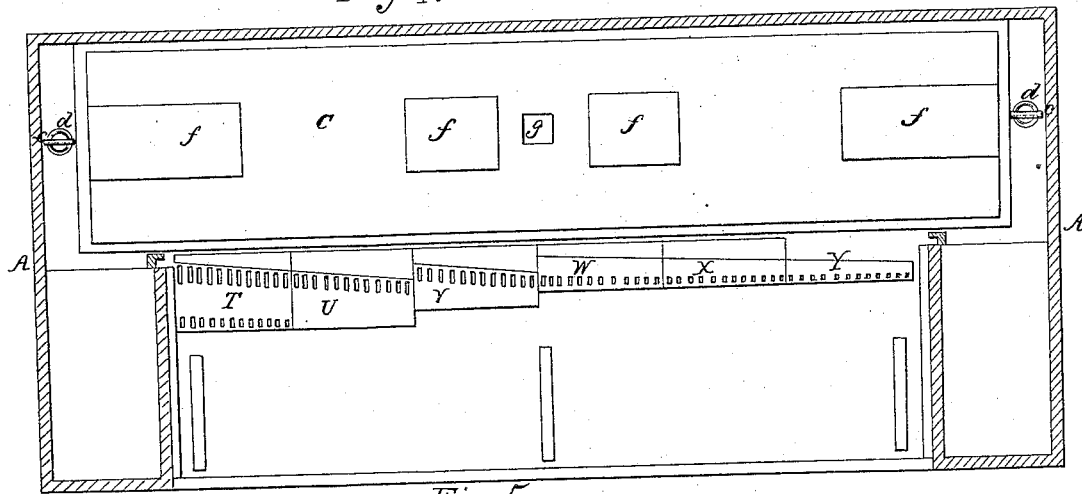
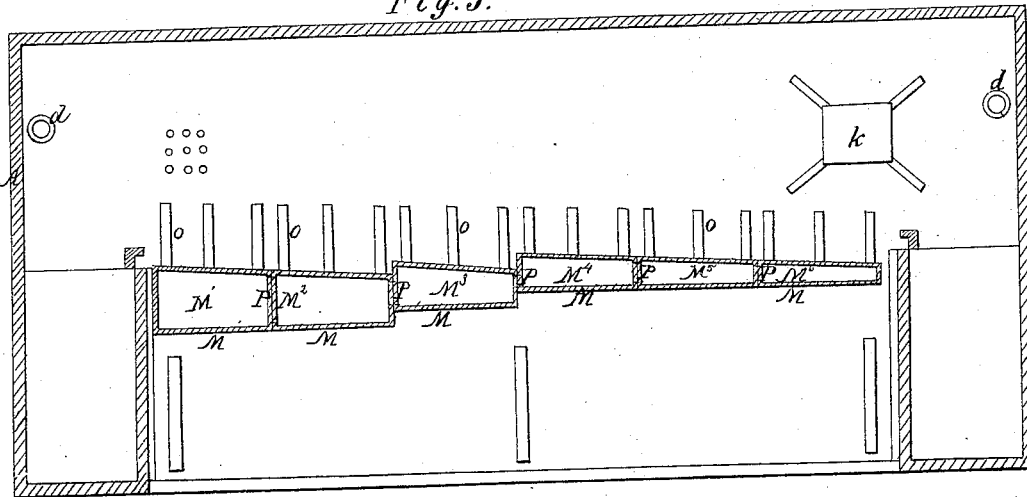


Fig. 5.



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Fig. 7.

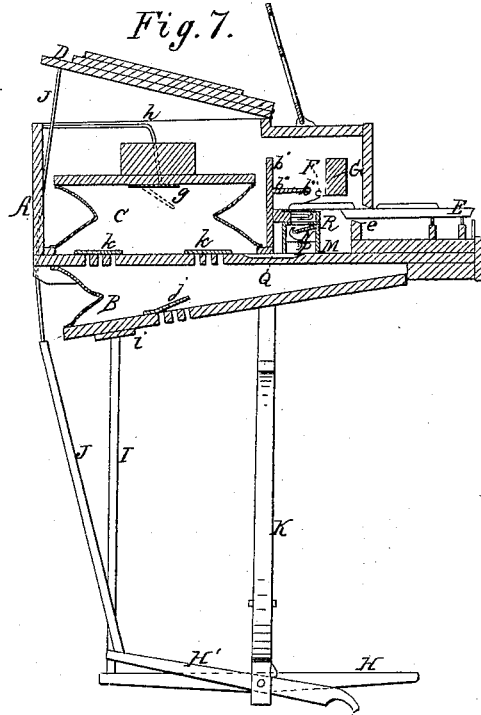
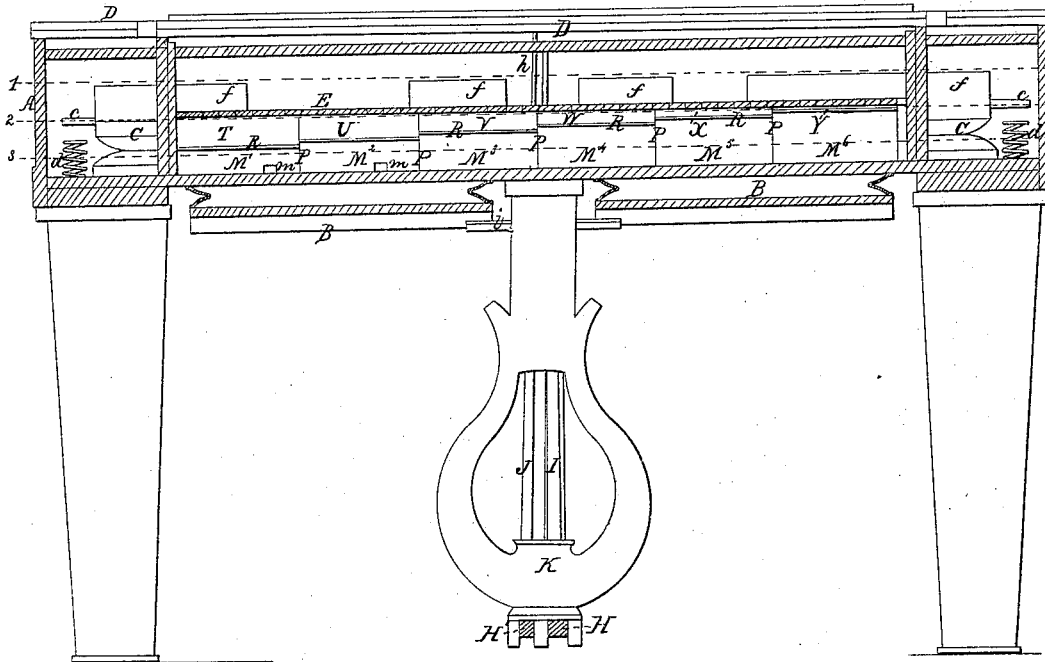


Fig. 6.



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Fig. 8.

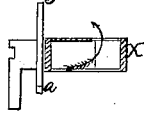


Fig. 9.

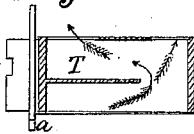


Fig. 10.

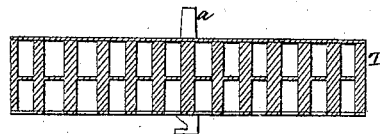


Fig. 11.

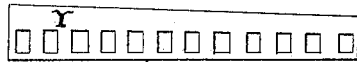


Fig. 17.



Fig. 12.

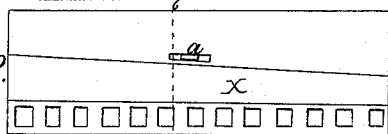


Fig. 18.

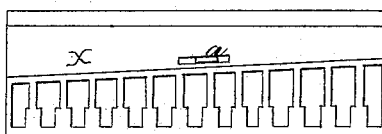


Fig. 13.

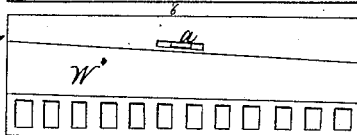


Fig. 19.

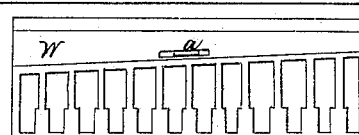


Fig. 14.

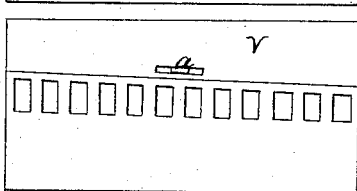


Fig. 20.

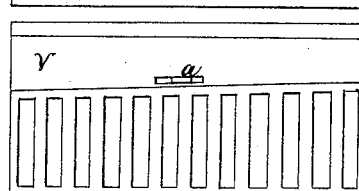


Fig. 15.

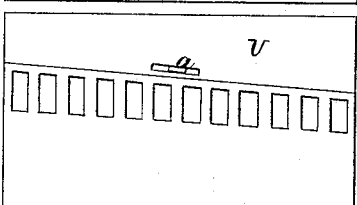


Fig. 21.

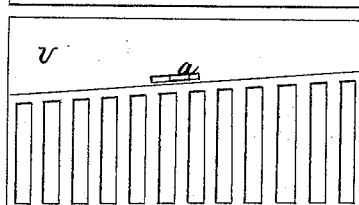


Fig. 16.

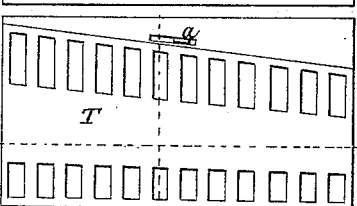


Fig. 22.

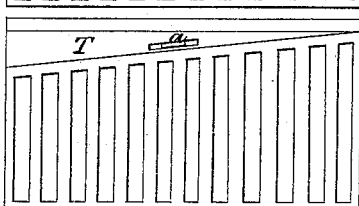


Fig. 23.

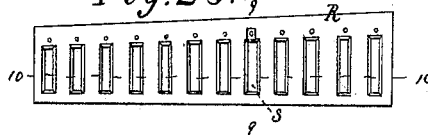


Fig. 24.

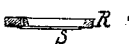


Fig. 25.



UNITED STATES PATENT OFFICE.

RUFUS NUTTING, 2D, OF ROMEO, MICHIGAN.

ORGAN-PIANO.

Specification of Letters Patent No. 5,438, dated February 8, 1848.

To all whom it may concern:

Be it known that I, RUFUS NUTTING, 2d, of Romeo, Macomb county, and State of Michigan, have invented new and useful
5 Improvements in the Construction of Musical Instruments, called "Nutting's Organ-Piano," which is described as follows, reference being had to the annexed drawings of the same, making part of this specification.
10 tion.

Figure 1, represents a perspective view of the front of a common piano, to the interior of which I apply my improvement, as represented in Figs. 5 and 6. Fig. 2 is a perspective view of the back of the piano, showing the top raised to make a swell. Fig. 3, is a horizontal section at the dotted line 7, 7, of Fig. 6, the top and name board being removed, showing the receiver, spring
20 board, keys, &c. Fig. 4, is a horizontal section at the dotted line 2, 2, of Fig. 6, the key board, spring board, sounding board and keys being removed, showing the receivers, weights, caps, and front portion of the floor
25 of the piano. Fig. 5, is a horizontal section on the dotted line 3, 3, of Fig. 6—showing the floor of the piano, and a set of apertures through which the air passes from the bellows, and a valve covering a similar set of
30 apertures—the wind chests and the channels, or grooves through which the air passes from the receivers to the wind chests. Fig. 6, is a vertical section on the dotted line 4, 4, of Fig. 3, showing the bellows, and wind
35 chests, caps, keys, ends of receivers, spiral springs, weights, pedals, connecting rods, valve-wire, case, and music holder—the other portions of the internal arrangement of the instrument being removed. Fig. 7, is
40 a vertical transverse section of the instrument at the dotted line 5, 5, of Fig. 3, showing the case, pedals, rods, bellows, receiver, wind chest, channel leading from the receiver to the wind chest, inclined sounding
45 board in the chest, cap, and diaphragm of leather, air conductors, seed plate, key, key spring, spring board, sounding board, valve, and rod. Fig. 8, is a vertical transverse section of cap X on the dotted line 6 6. Fig. 9,
50 is a vertical transverse section of cap T, on the dotted line 7, 7. Fig. 10, is a vertical longitudinal section of cap T, on the dotted line 8, 8. Figs. 11, 12, 13, 14, 15, 16, views or plans of the six caps, looking down upon
55 them, showing the pieces of leather secured to the same. Figs. 17, 18, 19, 20, 21, 22,

views of the under sides of said six caps, showing the strips of leather thereon. Fig. 23 a plan of one of the reed plates, there being only one of the reeds in its place. 60
Fig. 24 is a vertical transverse section of said plate and reed on the dotted line 9, 9, of Fig. 23. Fig. 25, is a vertical longitudinal section on the dotted line 10, 10, of Fig. 23. 65

Similar letters in the several figures refer to corresponding parts.

The external case A, of the organ piano or other instrument to which I apply my improvements may be made in the usual 70
manner, as represented in Figs. 1, 2, 3, 4, 5, 6 and 7, or in any form to suit the views of the constructor.

The bellows B, receiver C, top D, keys E, springs F, spring board G, pedals H, H', 75
connecting rods I, J, fulcrum piece or lye K may be made in the usual or most approved mode.

My improvements relate to the peculiar construction, and novel arrangement of a 80
series of caps, that are made to cover the reed plates, having passages therein to conduct the wind from the reeds to the termination of said apertures, which are closed
85 by the keys; and to a sounding board, arranged over the said caps, and to other sounding boards arranged beneath the reeds in the wind chests; and to a new arrangement of wind chests below the reeds—the
90 said caps defending the reeds from moisture, dirt, and from accidents; dispensing with valves under the reeds; false keys and pistons; rendering access to the reeds easy; and improving the quality and duration of
95 the tones, and sending the instrument capable of producing music of any movement, and of any power, from the softest tones of the æolian harp, to the heaviest of the small church organ, accurately and taste-
100 fully played upon it—being more durable, and permanent, than the Coleman piano, the pianoforte, the harpsichord, and seraphine, and requiring less tuning than either of those instruments, or the common pipe organ, and having tones more like the human
105 voice, and being so very compact and portable to be easily applied to any description of organ or piano, and to an easy chair, center table, bureau, and other articles and well adapted to church use. 110

The wind chests M, for the purpose of holding a body of wind or air, which being

compressed modifies the tones, and also by the position of the inclined sounding board N, to give a certain direction to the current of wind as indicated by the arrow in the transverse section Fig. 7. The wind chests are made of thin pieces of wood about one-fourth of an inch thick, and glued or otherwise fastened to the floor of the instrument. They are made generally about six inches long, except the one represented at M⁵ which is half an inch longer, for greater convenience in an instrument of only five octaves—the width and depth being in due proportion to the length open on the top where the reed plate is placed, and each containing an inclined sounding board N, of pine, about one-eighth of an inch thick and as long as the inside of the chest, and about three-fourths its width, and glued to the front edges as high as the upper edge of the chest—the back edge being dropped about half an inch, or as much as will give it the required inclination.

Conducting trunks O leading from the receiver into the wind chests, are arranged in convenient positions on the floor of the piano, for conveying the air from the receiver to the wind chests. Openings P are made in the ends of the wind chests that come together, to allow the wind to pass from one to the other. The inner or inclined sounding boards also increase the vivacity and fineness of the tones of the instrument by their elasticity, and causing the wind to strike the reeds in a particular direction. Grooves Q Fig. 7 may be cut in the floor, to conduct the wind from the receiver under its frame, to the wind chests, as substitutes for the trunks.

The reed plates R, are placed upon these wind chests. Each reed plate is made of soft metal of a trapezoidal shape, or of a shape corresponding to that of the wind chest, having as many oblong parallel openings, as there are to be reeds, widening gradually from the under to the upper side—the four sides sloping upward at an angle of about thirty-five degrees.

The object of increasing the size of the openings from the under to the upper side, is that the reeds may be bent as little as possible, by the wind passing through the openings—and thus diminishing their action so that the reeds may be rendered as durable as possible, and answer instantly to the action of the key.

The plates are made of an alloy, which will fuse perfectly at a less temperature than will char wood; is stiff and yet so soft that the reed, as it is riveted on, will sink in the plate a little, so as not to be moved sidewise, and that it may be made smooth and true with an edged tool; is nearly free from sonorous or vibrating properties, and by the action of the atmosphere oxidizes but

slowly. The reeds S, are made of hard brass, and are secured to the plates by rivets headed at one end upon the reed and at the other upon a piece of hard metal placed between it and the reed plate.

The caps T, U, V, W, X, Y, for defending the reeds from moisture, dirt, accident, and for improving the quality and duration of the tones and for dispensing with valves under the reeds, false keys, and pistons, are made of pieces of pine wood, and soft leather of a trapezoidal or other form of different sizes, partitioned off by thin partitions into as many parallel cells or chambers as there are keys for each section, decreasing gradually in length, and surrounded on their upper and lower edges by strips of soft leather.

The chambers of the large cap marked T, are divided horizontally at the middle by soft leather diaphragms or partitions, two thirds of the length of the said chambers, or cells, glued therein or otherwise secured in the position represented at Figs. 9 and 10 for the purpose of conducting the wind to the reeds in a proper direction as represented by the arrows, and to aid in giving volume and pureness to the tones. The top is covered by a trapezoidal shaped piece of soft leather about the length of the cap and nearly as wide, cut into two rows of openings directly over the cells or chambers over which the keys are arranged, there being two of said openings under each key and over each cell or chamber. The wind passes through these openings when the keys are raised. To the back edge of this wooden cap is glued a strip of wood about $1\frac{1}{4}$ inches wide and $\frac{1}{4}$ inch thick to keep it from warping, resting upon blocks of wood glued to the frame of the receiver.

The cap should generally be made of a block of soft pine wood, having the grain running in the direction of the length of the cells which are formed in the block, or in any more convenient way. They are held in their proper places upon the reed plates, by hooks *a* attached to the caps and hooked over pins or screws inserted into the backs of the wind chests. This arrangement enables the performer to gain access to the reed plate with great facility.

The cap lettered U, is made in the same manner as cap T, except in relation to the leather glued on top of it, which has only one row of openings, corresponding with the cells or chambers, in number and width, but not in length, being less than half their length. The cap lettered V, is made, arranged and secured in the same manner as cap U.

The cap lettered X is made differently, the chambers being made to extend only half way through the block except over the riveted ends of the reeds, where they extend entirely through. The portion of each

chamber not extending through the block, is made of greater width than the other portion extending through. There are no leather diaphragms or partitions in this cap, but the upper and lower edges of the openings or chambers are lined with leather, in the manner before described; and the cap is arranged and secured in the same way. It is made about a half inch longer to correspond with the length of the fifth reed plate.

Cap W is made and arranged in the same manner as cap X except that it is half an inch shorter than cap X.

The sixth cap or cap Y, Fig. 11, is made of two thicknesses of soft leather, glued together, having apertures therein, directly over the reeds, and covered by the keys. This cap is held to its place by the keys, and therefore needs no hook and pin to hold it to the wind chest, which is made narrower and taller than the other wind chests. The wind chests increase gradually in height from M' to M^c.

E are the keys placed upon the caps, the fulcra being seen at e—F springs, and G spring board made in the usual manner.

b, b'', Figs. 3 and 6, is an additional sounding board. This sounding board is arranged above the caps, and is designed for giving volume, smoothness, and vivacity to the tones by its elasticity and power of reflection. It is generally made about 40 inches long of bass, and pine wood, but may be made of any suitable wood, and of any convenient size. The vertical part b' which may be of bass wood, is about two and a half inches wide—and half an inch thick. The horizontal part b b'' is about 2½ inches wide and ½ inch thick at the edge b'' which is glued into a groove made in the vertical part, and ¼ inch thick at the outer edge, which is directly over the openings in the caps closed by the keys. c c are pieces projecting from the center of each end of the receiver, and which strike upon wire springs d d placed upon the floor of the instrument at a certain point, in the de-

scent of the top of the receiver, and thus gradually counteracting the effects of the weights f f, placed upon the top of the receiver, and thereby enabling the performer to give dynamic expression with greater ease.

The safety valve g, is attached to the under side of the top of the receiver C, and during the process of inflation is kept closed by the pressure of the contained wind. To avoid straining the receiver or other parts connected therewith by an undue pressure, a bent wire rod h is attached to the back of the case A by one end, the other end being placed in such a position that when the receiver is fully distended the safety valve strikes against it, and is opened, and made to assume the position represented by dotted lines in Fig. 7,—thus permitting the surplus wind to escape without doing injury.

i is the piece of wood, connecting the bellows, to which the pedal rod is attached.

j is the valve for opening and shutting the apertures, in the bottom of the bellows.

k k are valves for opening and closing the apertures, leading from the bellows into the receivers.

What I claim as my invention and desire to secure by Letters Patent is—

1. The caps combined with the reed plates, whether constructed in the manner described or other mode substantially the same by which analogous results are produced.

2. I claim the additional sounding board, placed over the caps.

3. I claim the inclined sounding boards under the reeds.

4. I claim the wind chests combined with the receiver and reed plates, whether constructed in the manner described or other mode substantially the same, for the purpose set forth.

RUFUS NUTTING, 2ND.

Witnesses:

GIDEON GATES,
C. JANE OWEN.