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PATENTED JUNE 16, 1908.

R. H. McHARDY.

PNEUMATIC FOR KEYBOARD MUSICAL INSTRUMENTS.

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Fig. 1,

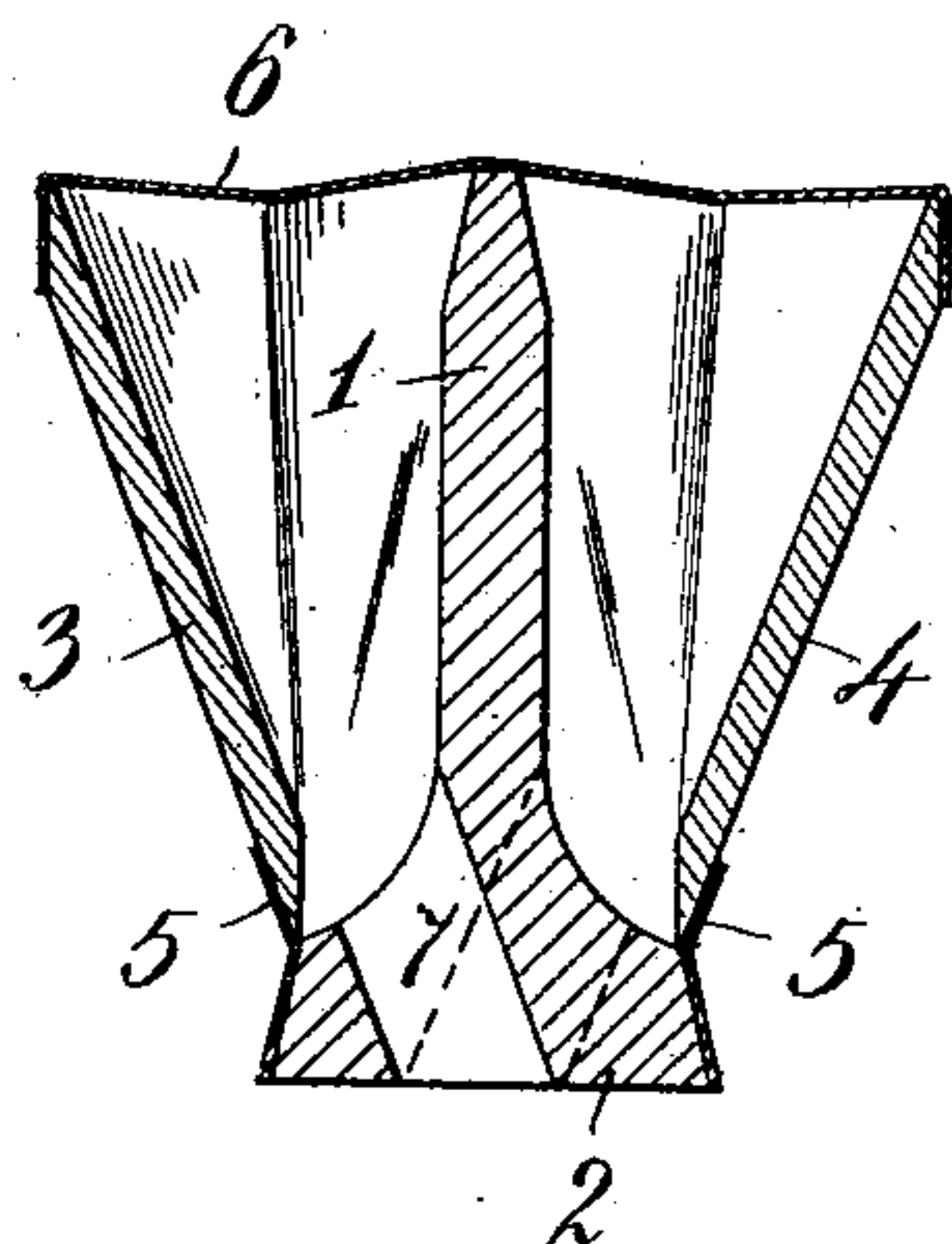


Fig. 2,

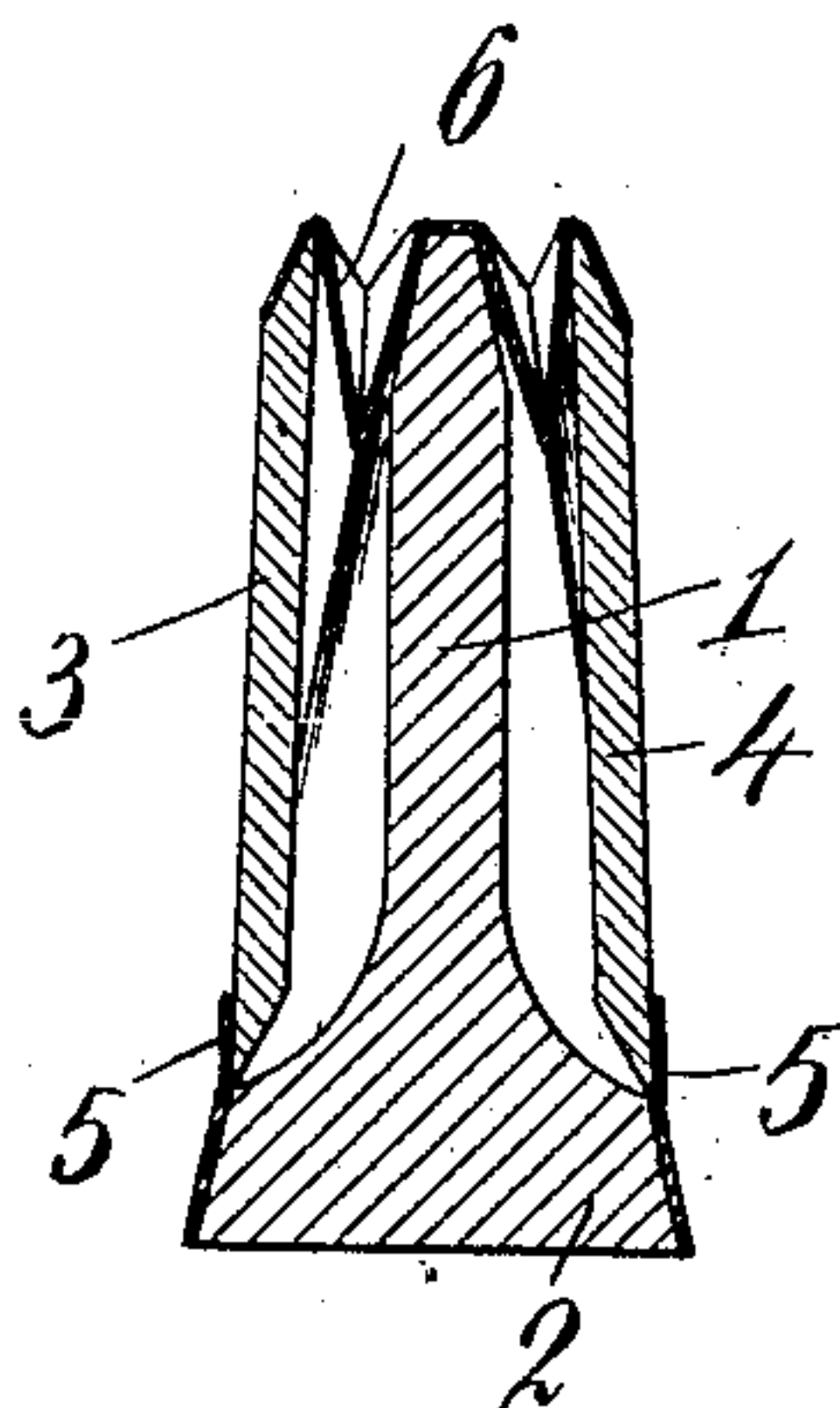


Fig. 3,

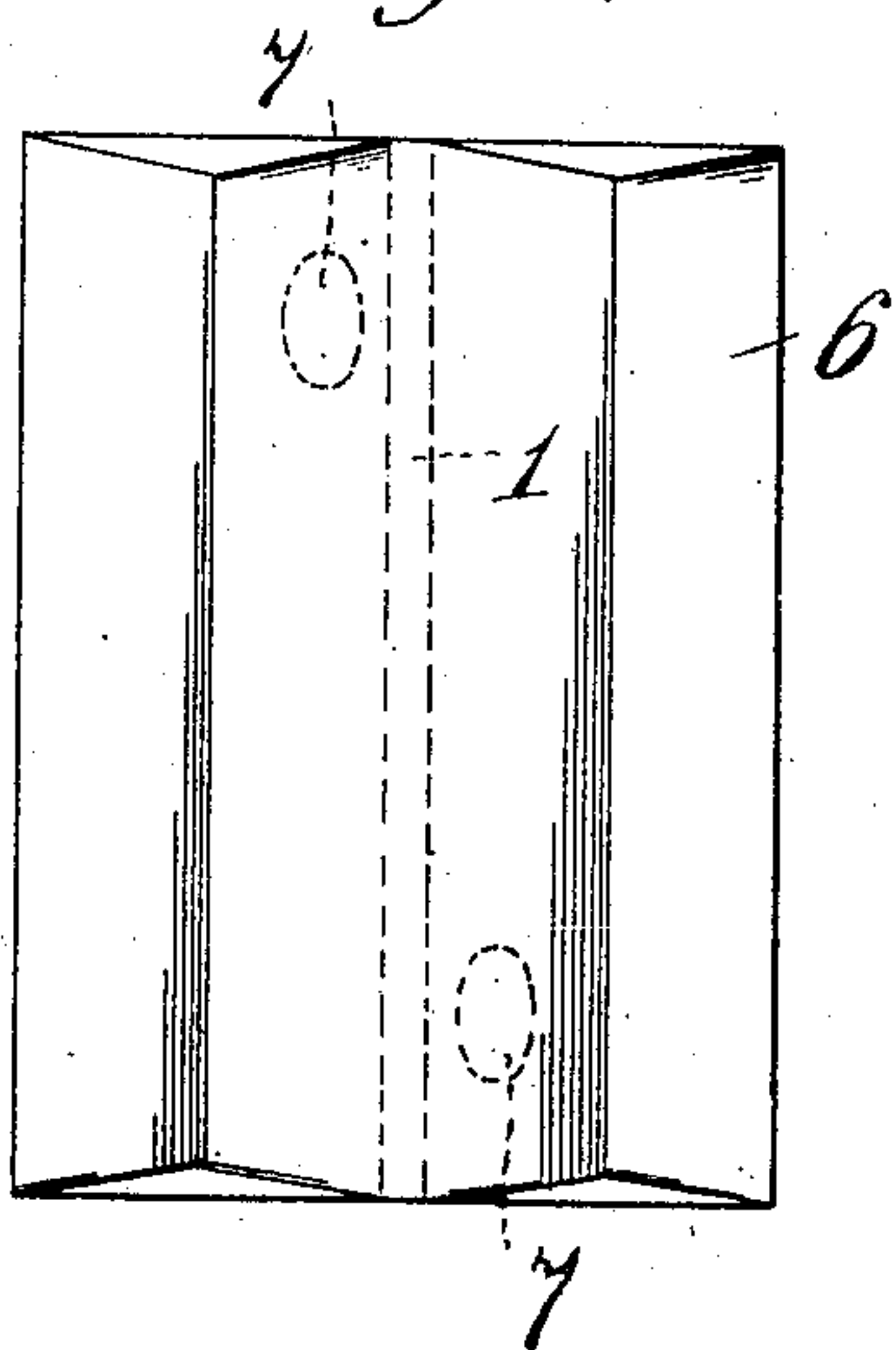
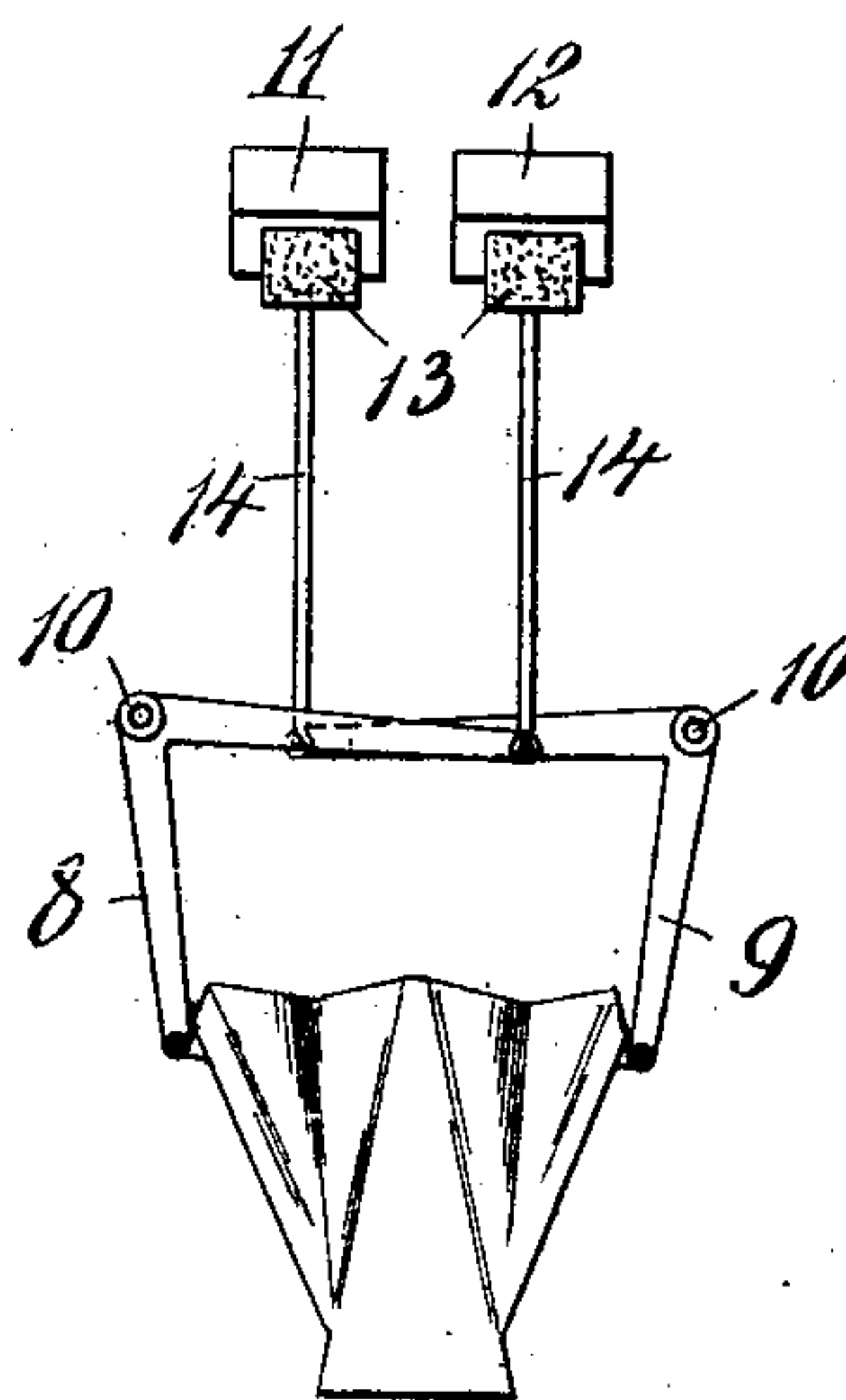


Fig. 4,



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# UNITED STATES PATENT OFFICE.

RUDOLPH HERMANN McHARDY, OF LONDON, ENGLAND.

## PNEUMATIC FOR KEYBOARD MUSICAL INSTRUMENTS.

No. 890,694.

Specification of Letters Patent.

Patented June 16, 1908.

Application filed August 23, 1907. Serial No. 389,774.

*To all whom it may concern:*

Be it known that I, RUDOLPH HERMANN McHARDY, a subject of the King of Great Britain and Ireland, and a resident of London, England, have invented certain new and useful Improvements in Pneumatics for Keyboard Musical Instruments, of which the following is a specification.

This invention relates to pneumatics for use in mechanically operated keyboard musical instruments, and particularly automatic pianos.

The object of the invention is to provide an improved construction of pneumatic, to the end that the large number of pneumatics which are necessary in an automatic keyboard instrument shall occupy comparatively small space, without a sacrifice in the size and power of the pneumatics or in the strength of the structure. This object is attained by constructing the pneumatics in pairs by arranging the movable members of two pneumatics on opposite sides of a wall or partition which is common to both of them, so that in the operation of the pneumatics these movable walls move toward and away from the central common wall. In this way, a pair of pneumatics occupies but little more space than a single one constructed as has heretofore been the practice, this reduction in the space occupied by the pneumatics being of material importance in the construction of mechanically operated pianos, and the completed structure can be manufactured at a reduced cost, these advantages being attained without a sacrifice in the power and strength of the pneumatics.

The preferred embodiment of my invention is illustrated in the accompanying drawings, in which

Figure 1 is a central section through a pair of pneumatics showing the movable members thereof in open position; Fig. 2 is a similar view with the movable members in closed position; Fig. 3 is a top view; and Fig. 4 is a view in elevation showing the preferred connections between the movable members of the pneumatics and the keys of the instrument.

Referring to these drawings, 1 indicates a central partition or molding consisting of an upright wall and an enlarged base 2 by which the pair of pneumatics is supported within the instrument. This piece is preferably of wood and being of uniform cross-section throughout can be manufactured at

very low cost. The movable members 3 and 4 of the pair of pneumatics are hinged to the base 2 of the central partition 1 on opposite sides of the latter, preferably by means of strips 5 of kid or similar flexible material. The top and sides of the movable members 3 and 4 are connected to the top and sides of the partition 1 by means of a single piece or two pieces 6 of kid or other suitable flexible material, and this is preferably creased as indicated in the drawings, so that in the movement of the members 3 and 4 toward and away from the partition 1 the folding of this material will offer but little retardation.

The piece or pieces 6 are preferably glued to the beveled edges of the members 3 and 4 and to the edge of the partition 1. Openings 7 are formed in the base 2 of the partition 1, leading one to one side of the partition and the other to the opposite side, as shown in Figs. 1 and 3, these openings carrying the air to and from the two pneumatics, whereby the latter are inflated and collapsed either simultaneously or independently.

The movable members 3 and 4 of the two pneumatics are connected in any suitable way to independent keys of the instrument, so as to actuate the latter. The connections which I prefer to use are those shown in Fig. 4, wherein 8 and 9 indicate two bell-crank levers pivoted at 10 and each connected at one end to one of the movable members 3 and 4 of the double pneumatic. The opposite ends of the two bell-crank levers extend in opposite directions because of the opposite directions of movement of the movable members 3 and 4 of the pneumatics in operating the keys.

11 and 12 indicate two of the keys of the instrument, and these are adapted to be actuated by buffers 13 carried on the ends of links 14, each of the latter being connected at its lower end to the end of one of the bell-crank levers 8 and 9.

It will be seen that by constructing the pneumatics in pairs as herein described, with a common central wall and movable walls on opposite sides thereof, a very compact structure is obtained and one which may be manufactured at low cost.

Having thus described my invention, what I claim as new therein and desire to secure by Letters Patent is as follows:—

1. In a keyboard musical instrument, a pair of pneumatics having a common wall and two movable walls located one on either



side of said common wall, said pneumatics being adapted to be inflated and collapsed either simultaneously or independently, and connections between said movable walls and  
5 independent keys of the instrument, substantially as set forth.

2. In a keyboard musical instrument, a pair of pneumatics having a common central wall, movable walls hinged to opposite sides  
10 of said central wall and flexible material secured to said central and movable walls, said central wall having openings therein leading to opposite sides thereof for the passage of air for inflating and collapsing said pneu-  
15 matics either simultaneously or independently, and connections between said movable walls and independent keys of the instrument, substantially as set forth.

3. In a keyboard musical instrument, a  
20 pair of pneumatics having a common central wall provided with an enlarged base, movable walls hinged to said base on opposite sides of the central wall and flexible material secured to said central and movable walls,  
25 said base having openings therethrough lead-

ing to opposite sides of said central wall for the passage of air for inflating and collapsing said pneumatics either simultaneously or independently, and connections between said movable walls and independent keys of the  
30 instrument, substantially as set forth.

4. In a keyboard musical instrument, a pair of pneumatics having a central common wall and movable walls hinged thereto on opposite sides thereof, said pneumatics being  
35 adapted to be inflated and collapsed either simultaneously or independently, a pair of pivoted bell-crank levers each having one arm pivotally connected to one of said movable walls, the other arms of said levers ex-  
40 tending in opposite directions, and connections between said last-named arms and independent keys of the instrument, substantially as set forth.

This specification signed and witnessed  
45 this 21st day of August, 1907.

RUDOLPH HERMANN McHARDY.

Witnesses:

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