

P. B. KLUGH.
PNEUMATIC MUSICAL INSTRUMENT.
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942,915.

Patented Dec. 14, 1909.

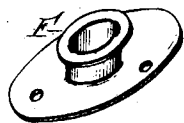
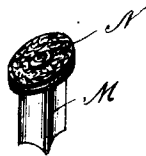
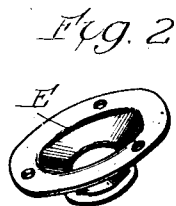
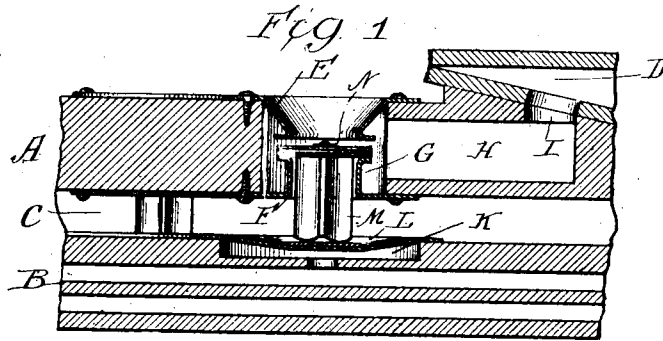
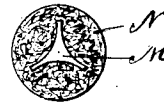


Fig. 3.



Witnesses
F. A. White
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Inventor
Paul Brown Klugh
by J. Clarke Hager
his attorney

UNITED STATES PATENT OFFICE.

PAUL BROWN KLUGH, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE CABLE COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

PNEUMATIC MUSICAL INSTRUMENT.

942,915.

Specification of Letters Patent. Patented Dec. 14, 1909.

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To all whom it may concern:

Be it known that I, PAUL BROWN KLUGH, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Pneumatic Musical Instruments, of which the following is a specification.

My invention relates to the construction of valves and valve-seats, such as are used in organs and automatic player mechanism for various musical instruments, the purpose and novel feature of which will be respectively pointed out in the following detailed description and claims.

Figure 1 is a fragmentary view in vertical section of enough parts of a pneumatic player-mechanism to demonstrate the use, location, and construction of my invention; Fig. 2 is a perspective view of the parts of the invention separately displayed; and Fig. 3 is an end view of the part centrally displayed in Fig. 2.

A represents the valve-board forming the upper member of an air-chamber C and B the "pouch" or diaphragm-board forming the lower member thereof. (The end and side members for inclosing this chamber are not shown.) It will be understood that the mechanism I shall describe in connection with this chamber is duplicated in accordance with the number of notes to be sounded.

At D, I have shown the end part of one of a series of "pneumatics" which are secured upon the member A. Connected by means of the passages H and I with the interior of each pneumatic is a valve-chamber G. Each chamber G is formed in the member A by boring completely therethrough and fitting the ends of the opening with valve-seats or "cups" E and F.

The valve N rests normally upon the seat-flange of the lower cup F and is guided during vertical movement by the wings formed upon the valve-stem M. This stem extends through the barrel of the cup and is suspended by the valve over the usual diaphragm-pneumatic L. Elaborate description of the operation of this valve is unnecessary.

A partial vacuum is produced in the chamber C when the instrument is to be operated but with the valve in the position shown in Fig. 1 the chamber G, passages H and I and pneumatic D are held from communication with the chamber C and are

flushed with atmospheric air entering through the upper cup E. As is well known, the valve N may be raised from the position shown and pressed upwardly against the seat-flange of the upper cup E upon admission of atmospheric pressure to the chamber K and consequent inflation of the diaphragm pneumatic L caused by a perforation in the usual controlling-sheet. In such an instance air is prevented from entering through the cup E and the vacuum existing in the chamber C and around the webbed stem M, may extend through the lower cup F to the chamber G, passages H and I and pneumatic D.

My improvement consists in the peculiar shaping of both the upper and lower cups and particularly in the unique manner of turning the seat-flange thereupon. It is of vital importance that air in passing through the cups should not be obstructed nor caused to pass over sharp edges. As the seat-flange is formed upon a plane parallel with the valve and as the valve is never drawn away from the seat any greater distance than is absolutely necessary, it will be seen that the sharpest turn that the passing air is compelled to make exits at the inner edge of the flange. Heretofore valve-cups have been formed with the seat-flange turned inwardly from the barrel, thus presenting a sharp edge to the passage of air at the point designated. I have reversed this construction and an examination of Figs. 1 and 2 will show that the inner-edges here present a smooth, rounded surface. In most instances the diameter of each valve-chamber G is restricted by the scale or limited distance between the separate note-actions and, as passage H leads from one side of chamber G, a free circulation of air is desirable within the chamber to permit air-access to the circular valve from all sides. It will be seen that with a valve-cup-flange of given diameter, the connection of the barrel with the inner rather than the outer edge of the flange provides more annular space between the said barrel and the sides of the surrounding chamber. With a view toward reducing friction I prefer to taper the barrel of the upper cup and for the purpose of affording a single guide for the valve-stem M, I construct the lower cup with a straight barrel.

For convenience in manufacture I prefer to use a valve-disk N which is faced before attachment to the valve-stem M with oppo-

site surfaces of leather or other suitable packing-material. While I have shown and in this instance prefer to use a valve having a valve-stem rigidly connected therewith to
5 serve as a valve-guide, I do not wish to confine or limit myself to the combination of the cups and this peculiarly shaped valve. The cups may be used advantageously with a variety of valve constructions and in some
10 instances it may be advisable to employ upper and lower cups of the same shape.

I claim:

1. In a pneumatic musical instrument, the combination with an air-passage, a port for
15 connection with said passage, and a valve for controlling such connection, of a member positioned to afford a seat for the valve having an opening and a flange turned outwardly from and surrounding said opening
20 upon which the said valve may rest, said flange having a flat valve-seating surface and a rounded inner edge.

2. In a pneumatic musical instrument, the combination with an air-passage, a port for
25 connection with said passage, and a valve for controlling such connection, of a member

positioned to afford a seat for the valve comprising a barrel having at one end an outwardly-turned annular flange upon which said valve may rest, said flange having a
30 flat valve-seating surface and a rounded inner edge.

3. In a pneumatic musical instrument, the combination with an air-passage, a port for connection with said passage, and a valve
35 for controlling such connection, of a member positioned to afford a seat for the valve comprising a barrel having at one end an outwardly-turned annular flange upon which said valve may rest and at the other end a
40 second outwardly-turned annular flange by which the said member may be secured in position, the first-mentioned flange having a flat valve-seating surface and a rounded inner edge.

Signed at Chicago, Illinois, this eighteenth day of August, 1908, in the presence of two subscribing witnesses.

PAUL BROWN KLUGH.

Witnesses:

W. W. KERR,
T. HESSLER.