

No. 844,879.

PATENTED FEB. 19, 1907.

E. DE KLEIST.
VALVE FOR PNEUMATIC MUSICAL INSTRUMENTS.
APPLICATION FILED NOV. 27, 1905.

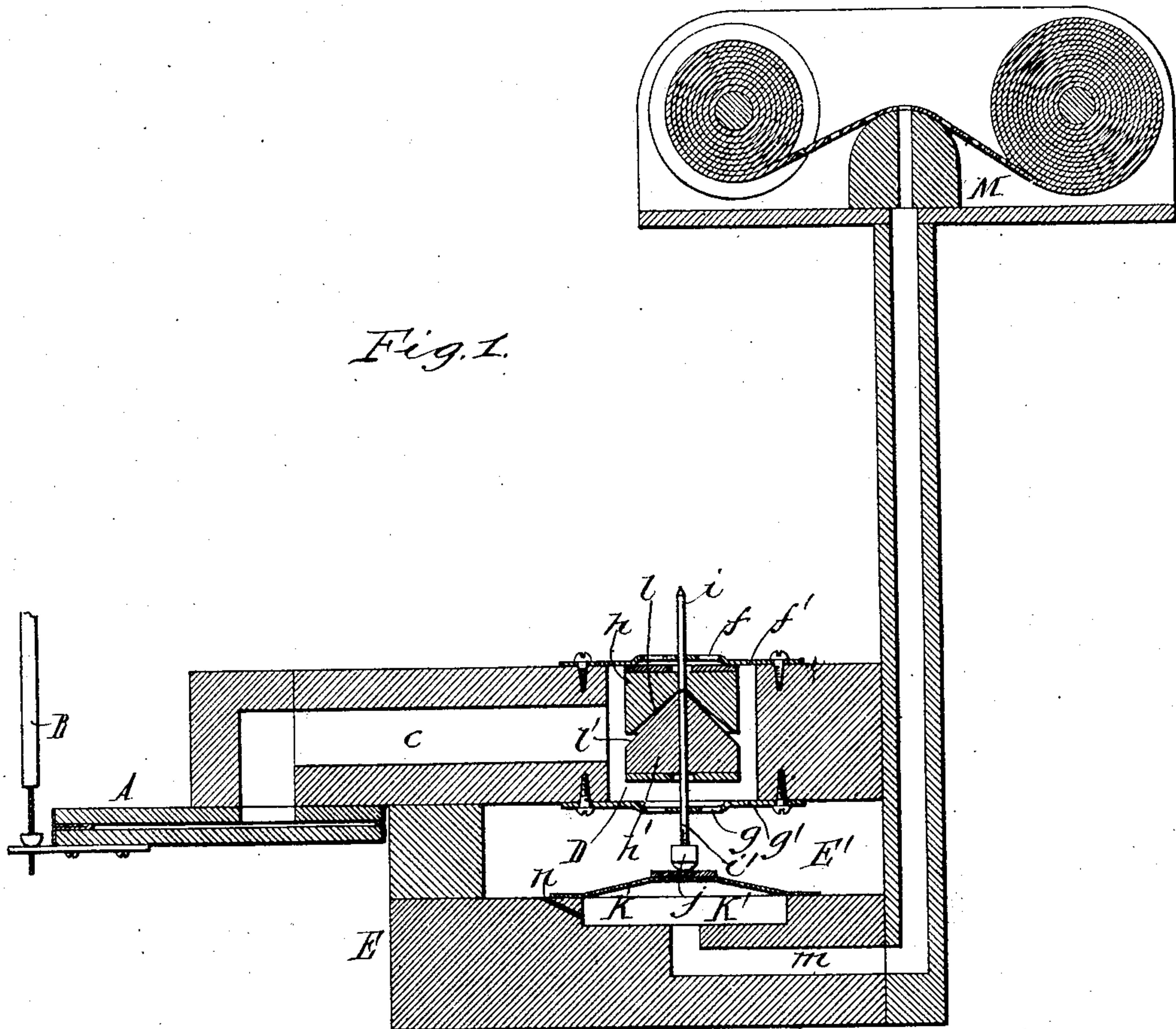
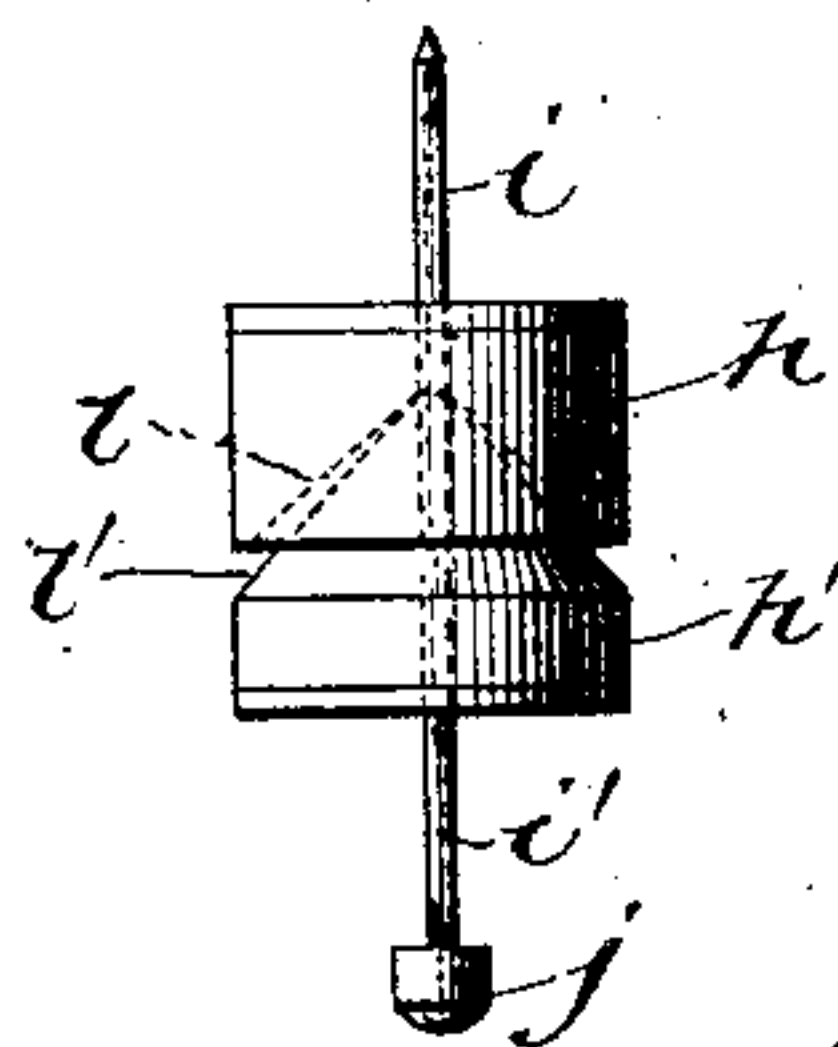


Fig. 1.

Fig. 2.



Engine de Kleist.

Witnesses:
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UNITED STATES PATENT OFFICE.

EUGENE DE KLEIST, OF NORTH TONAWANDA, NEW YORK.

VALVE FOR PNEUMATIC MUSICAL INSTRUMENTS.

No. 844,879.

Specification of Letters Patent.

Patented Feb. 19, 1907.

Application filed November 27, 1905. Serial No. 289,208.

To all whom it may concern:

Be it known that I, EUGENE DE KLEIST, a citizen of the United States, residing at North Tonawanda, in the county of Niagara and State of New York, have invented a new and useful Improvement in Valves for Pneumatic Musical Instruments, of which the following is a specification.

This invention relates more particularly to that class of valves which are employed in pneumatic pianos, piano-players, and other pneumatic musical instruments and which are capable of a limited swiveling action to enable them to adapt themselves to any imperfections of their seats, due to warping or other causes, thus insuring a reliable closure of the same under all conditions.

It is the object of my invention to provide a simple and reliable valve of this kind which can be cheaply produced.

In the accompanying drawings, Figure 1 is a fragmentary vertical section of an automatic piano embodying my invention. Fig. 2 is a side elevation of the duplex valve.

Similar letters of reference indicate corresponding parts throughout the several views.

In the drawings but a single unit of the pneumatic action is shown, as the general organization of such instruments is well understood by those skilled in the art, an example being found in Letters Patent of the United States No. 726,701, granted to me April 28, 1903.

A indicates one of the motor-pneumatics of the action, and B the sticker, which transmits the motion of the same to the piano-hammer or other sound-producing part. (Not shown in the drawings.) The motor-pneumatic is connected by a duct or channel *c* with a valve-chamber D, preferably arranged in the top board of the wind-chest E. This valve-chamber communicates at its upper end with the atmosphere by vent-ports *f*, while its lower end communicates by ports *g* with the exhaust-chamber E' of the wind-chest. These ports are formed in guide-plates *f'* *g'*, secured to the upper and lower ends of the valve-chamber. The vent and exhaust ports are controlled by a double puppet-valve arranged in the valve-chamber. The upper member *h* of this valve is adapted to seat against the upper plate *f'* for closing the vent-ports, and the lower member *h'* is adapted to seat against the lower plate *g'* for closing the exhaust-ports, the arrangement being such that the ex-

haust-valve is opened when the vent-valve is closed, and vice versa, as is usual in this class of pneumatic actions.

The upper valve member *h* is provided with an upwardly-extending axial stem *i*, guided in a central opening of the top plate *f'*, while the lower valve member *h'* has a similar stem *i'*, passing downwardly through the lower plate *g'* and provided at its lower end with an adjustable nut or button *j*, which rests upon a flexible diaphragm K. The upper valve member rests loosely upon the lower member, and the contiguous faces of the two members are respectively concave and convex. In the preferred construction (shown in the drawings) the upper member is provided in its bottom with a conical socket *l* and the lower member has a conical upper end *l'* fitting into said socket, the conical contact faces of the two members being of different angles or pitches to allow each valve member to swivel in all directions on the other. This construction permits the valve members to seat squarely against the ends of the valve-chamber and to adjust themselves to any imperfection or unevenness of the valve-seats, such as is sometimes caused by the warping of the parts, due to atmospheric changes. The straight front ends of the valves are provided with the usual facings of leather or other suitable material. The flexible diaphragm K covers an air pocket or chamber K', which is connected with one of the ducts *m* of a tracker-board M and which also communicates with the exhaust-chamber E' by the usual small duct or pin-hole *n*. As is common in this class of pneumatic actions, the diaphragm K is permitted to descend under the weight of the valve members *h* *h'* when an imperforate portion of the customary music-sheet closes the duct *m*, thereby cutting off communication between the motor-pneumatic and the exhaust-chamber E' and placing it in communication with the atmosphere, while when a perforation of the music-sheet registers with said duct the diaphragm is elevated and reverses the valve members, thereby collapsing the motor-pneumatic and operating the corresponding sound-producing part.

I claim as my invention—

1. In a pneumatic musical instrument, the combination of a chamber having opposing ports, and a duplex valve comprising opposing valve-heads coöperating with said ports, one of said heads having a concave back and the other a convex back bearing against said

concave back, said heads being free to move at an angle to each other, substantially as set forth.

2. In a pneumatic musical instrument, the
5 combination of a chamber having opposing ports, and a duplex valve comprising opposing valve-heads cooperating with said ports, one of said heads being provided in its back with a conical socket and the other with a
10 conical rear end fitting into said socket, the contiguous faces of the two heads being of different pitches, substantially as set forth.

3. In a pneumatic musical instrument, the
15 combination of a wind-chest, a valve-chamber having exhaust and vent ports communicating respectively with the wind-chest and

the atmosphere, a duplex valve comprising exhaust and vent heads or members arranged in said chamber and controlling the corresponding ports thereof, one of said members
20 being provided in its back with a conical socket and the other with a conical rear end seated in said socket, and means for guiding said valve members, substantially as set forth.

Witness my hand this 18th day of November, 1905.

EUGENE DE KLEIST.

Witnesses:

C. F. GEYER,
E. M. GRAHAM.