

No. 881,402.

B. A. HOGLUND.

PATENTED MAR. 10, 1908.

MOTOR FOR MUSIC ROLLS OF PNEUMATIC MUSICAL INSTRUMENTS.

APPLICATION FILED FEB. 7, 1906.

2 SHEETS—SHEET 1.

Fig.1.

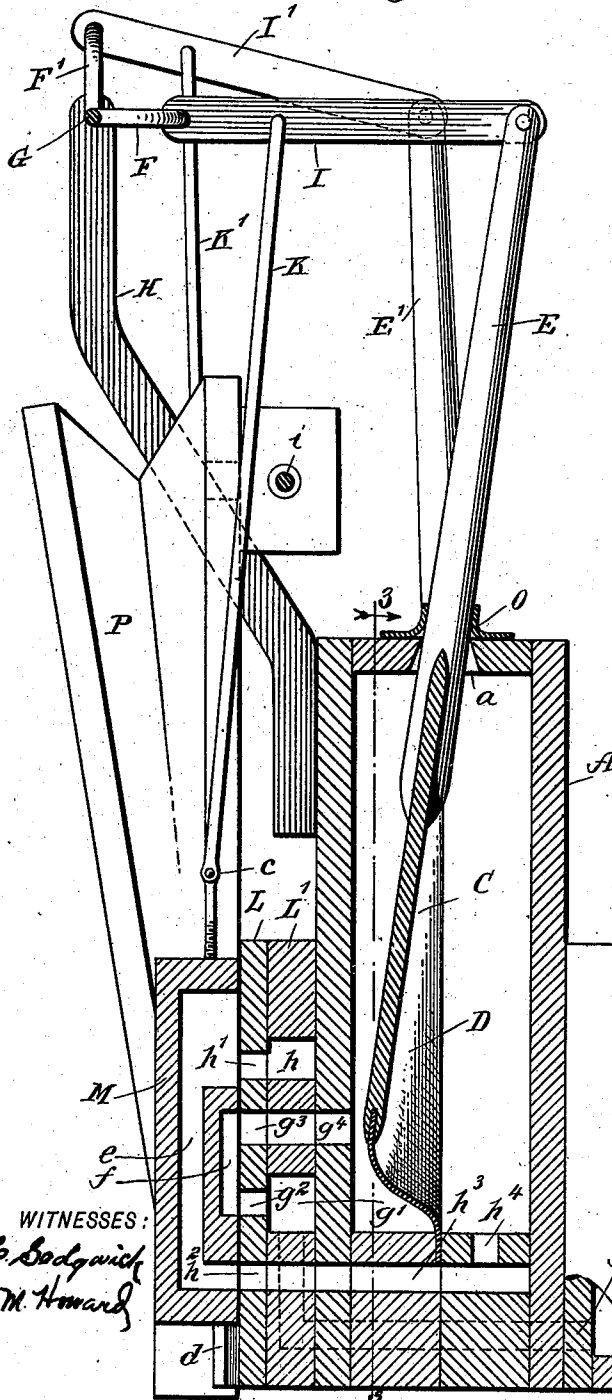
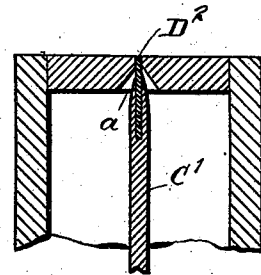


Fig. A.



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2 SHEETS—SHEET 2.

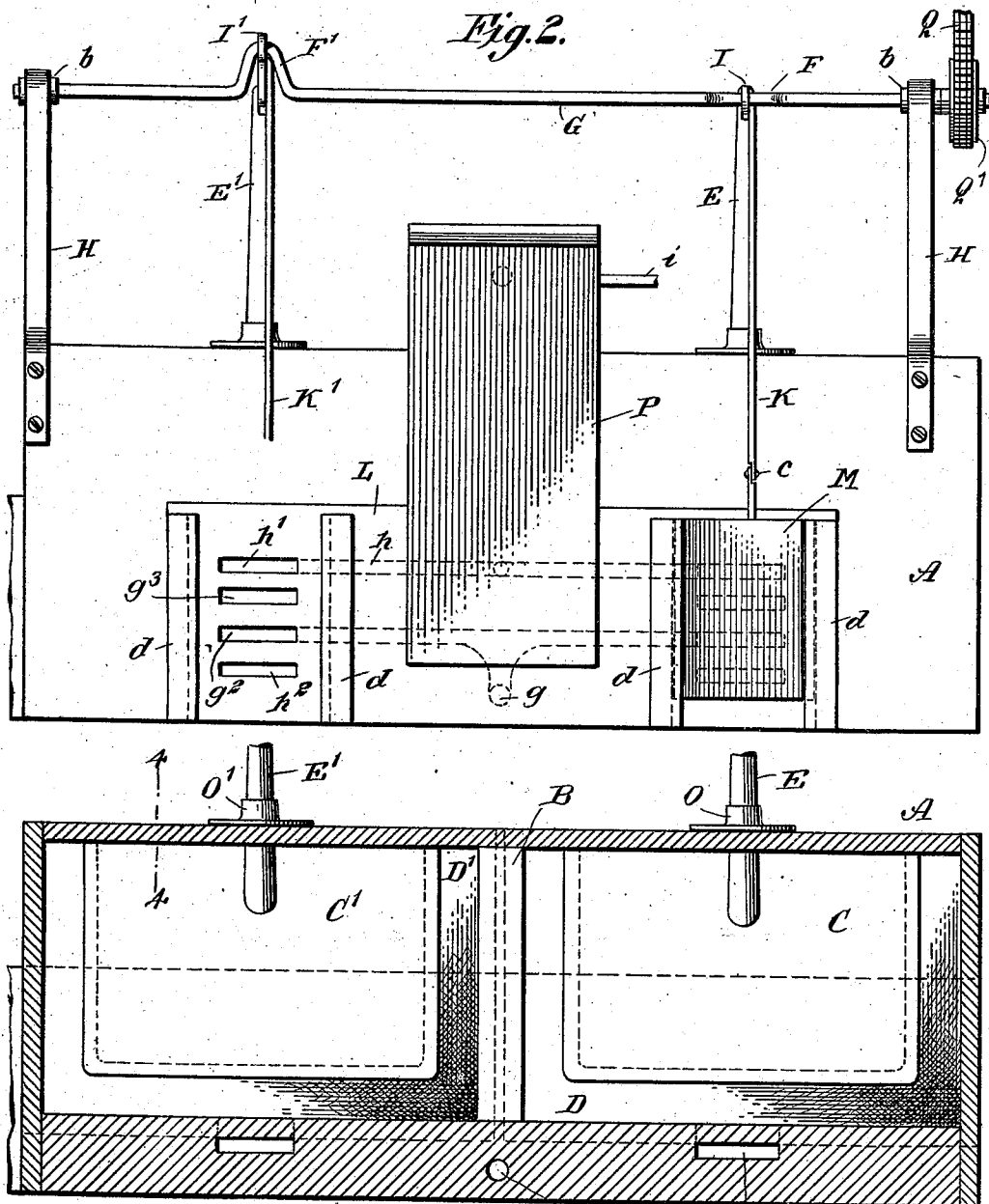


Fig. 3. 9

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MOTOR FOR MUSIC-ROLLS OF PNEUMATIC MUSICAL INSTRUMENTS.

No. 881,402.

Specification of Letters Patent.

Patented March 10, 1908.

Application filed February 7, 1906. Serial No. 299,945.

To all whom it may concern:

Be it known that I, BERNDT ALFRED HOGLUND, a citizen of the United States, residing at Williamsbridge, borough of the Bronx, city of New York, New York county, and State of New York, have invented certain new and useful Improvements in Motors for Music-Rolls of Pneumatic Musical Instruments, of which the following is a full, clear, and exact specification, reference being had to the accompanying drawings and to the reference characters marked thereon.

My present invention has relation to motors such as are employed in pneumatic musical instruments for winding and unwinding the music roll, these motors being operated by air pressure and principally by causing an exhaustion on one side and permitting the normal pressure of the atmosphere to act upon the other side, but sometimes by the employment of air under greater or less pressure.

The object of this invention is to provide or produce a pneumatic motor of few and simple parts, cheap and easy of construction and easy to be assembled and mounted in place for use, which will afford abundant power for effectually accomplishing the desired movements of the music roll at all times when in use, which may be easily and conveniently controlled so that the movements will be rendered uniform and so that it may be economically operated either by air at the ordinary pressure or by compressed air.

To accomplish all of the foregoing objects and to secure other and further advantages in the matters of construction, operation and use, my improvements involve certain new and useful arrangements or combinations of parts, peculiarities of construction and principles of operation, as will be herein first fully described and then pointed out in the claims.

In the accompanying drawings forming part of this specification, Figure 1 is a vertical view, partly in section and partly in elevation showing my improved motor as applied in connection with the crank shaft. Fig. 2 is an elevation corresponding with Fig. 1, omitting one of the valves. Fig. 3 is a vertical section and elevation as on a plane through line 3—3 of Fig. 1 and looking in the direction of the contiguous arrow. Fig. 4 is a sectional view of a fragment on a plane through line 4—4 of Fig. 3, showing the man-

ner of hinging the piston in one wall of the piston chamber.

In all these figures like letters of reference, wherever they occur, indicate corresponding parts.

The principal parts of the motor are preferably made of wood, although any other suitable material might be employed.

A is a box of general rectangular form and of suitable size, the same being made air tight except for the openings specially provided therein and being divided into compartments of substantially equal size by a suitable division strip, as represented at B. Each of these compartments is of general rectangular form and each constitutes a chamber for the piston which is movable therein. Two pistons are shown in the drawings, but a greater number may be employed if so desired.

The pistons are composed of rectangular plates or pieces, as C and C', these being preferably made of wood or other light material impervious to air. The pistons are each connected with four of the walls and at about their middle lines by a flexible diaphragm, as represented at D and D', the same entering a recess in the corresponding plate C or C' and also a recess in the surrounding portion of the piston chamber, and being secured in place so as to prevent passage of air through them or through the joints from one side to the other of the piston thus formed. These diaphragms may be made of leather, or of cloth coated with rubber, or of other suitable flexible material, and they are sufficiently extensive to permit of the movements of the piston from one side to the other of the piston chamber. Each piston is hinged along one wall of the piston chamber by a piece, as D², secured in the edge of the piston plate and also in the adjacent wall of the piston chamber, and this hinge, made of leather or fabric or other flexible material may be constituted of a portion of the diaphragm surrounding the other three edges of the piston plate, or it may be made of a separate piece. The hinges permit the pistons to move in the manner required and a portion of the wall adjacent to the hinge is recessed, as at a, so as to admit of the movements of the piston plate without interference by the wall of the piston chamber. Each piston is supplied with a projecting

stem or piston rod, as E, E¹, and these rods are connected with the cranks F, F¹, of a crank shaft, B. The crank shaft is preferably mounted in suitable journals, as *b*, *b*, in suitable supports as H, H, secured upon the piston chambers, and the piston rods E and E¹ are connected with their respective cranks by suitable connecting rods, I, I¹.

K and K¹ are valve rods connected with and operated by the connecting rods I and I¹ and serving to operate the valves, being suitably connected therewith by a joint, as at *c*.

L is the seat for a valve, the same being supplied with four openings and being sustained at a short distance from the wall of the piston chambers, on an intermediate block L¹ having openings through it which communicate through suitable channels with either side of the piston and with the trunk or reservoir.

M is one of the valves arranged to control the outlet of air from and the inlet of air to the corresponding portion of the piston chamber, the other valve being similarly constructed and arranged.

N is a trunk or reservoir from which air may be exhausted, or, if the motor is to be driven by compressed air, constituting a receptacle for containing a supply of compressed air. Any suitable mechanical means may be employed to exhaust air from or compress it in the reservoir.

The valves are suitably mounted upon their respective seats and they are confined in place by suitable guides, as *d*, *d*. Two passages in the valve, as *e* and *f*, connect the ports in the valve seat or disconnect them in the manner necessary for the operation of the motor. The piston being in the position indicated in Fig. 1, communication between the trunk N and the side of the piston nearest the valve seat is established through the channel shown in dotted lines at *g*, the channel *g*¹ in the block or plate L¹, the port *g*², the channel *f* in the valve, the port *g*³ and the opening *g*⁴, as will be readily understood. If the air be exhausted through these openings the piston will be carried towards the port *g*⁴. The other piston is at the same time moved in the opposite direction, and this compels the continuous movement of the crank shaft and the continuous movement of the valves, as will be readily understood. When the piston C has reached the limit of its travel in this direction, the valve commences to shift, air having been during the previous movement admitted to the opposite side of the piston through channel *h*, port *h*¹, passage *e* in the valve, port *h*², channel *h*³ and port *h*⁴. When the valve is moved sufficiently in the opposite direction the port *h* is opened into the channel *f* in the valve which then establishes communication between port

*h*¹ and port *g*³ and uncovers the port *g*², so that air will be exhausted from the opposite side of the piston through port *h*⁴, channel *h*³, channel *e*, port *g*², channel *g*¹, and channel *g*. In this manner the piston is made to swing back and forth on its hinge in its chamber and communicates movement to the crank shaft. When the air is exhausted from one side of the piston air is admitted to the other side so that the piston will move easily. To prevent leakage of air around the piston rods, flexible sockets, as O and O¹ are employed, these being secured upon the piston chambers and made to fit tightly around the piston rods, as indicated.

P represents a governor bellows which is kept normally opened in case exhaustion is employed, as by any suitable spring, or normally closed in case compressed air is employed, by any suitable form of spring or weight. Air from the exterior enters through this bellows to the channel *h* or the channel *h*³, being admitted to the bellows through a tube, as *i*, leading from a position where its inlet can be easily controlled. By means of this regulator bellows the speed of the motor is maintained at a practically uniform rate, the normal rate being determined by the degree to which the tube *i* is opened or closed. The music rolls are driven by any suitable chain or other connection, Q, with a driving wheel, Q¹, mounted upon the shaft G.

The improved motor being constructed and arranged substantially in accordance with the foregoing explanations is of few and simple parts, easily operative, economical of power, and well adapted for use in connection with mechanical musical instruments and especially for winding and unwinding the music rolls, but it may be employed in other situations and for analogous purposes. The piston rods are shown in general vertical position, but the motor may be placed in any position, being operative in one position as well as in another.

Having now fully described my invention, what I claim as new herein and desire to secure by Letters Patent, is:—

1. In a motor for music rolls of musical instruments, the combination of the two piston chambers, hinged pistons movable therein, diaphragms connected with the pistons and surrounding the same, projecting piston rods, connecting rods, crank shaft, valves, valve seats, trunk or reservoir, and a governor bellows, all constructed and arranged for operation substantially as and for the purposes set forth.

2. The herein described motor for music rolls of musical instruments, comprising the two piston chambers, hinged pistons movable therein, diaphragms connected with the pistons and surrounding the same, projecting piston rods, connecting rods, crank shaft,

valves, valve seats, trunk or reservoir, governor bellows, drive wheel applied on the crank shaft, and means for connecting said drive wheel with the object to be driven, all
5 constructed, arranged and combined substantially as shown and described.

3. In a motor for music rolls of musical instruments, the combination of the piston chambers having inlets and outlets for air
10 thereto and therefrom, of hinged pistons movable in said chambers, regulator valves

and a perforated block intermediate of said valves and the wall of the piston chambers, substantially as shown and described.

In testimony whereof, I have signed my
name to this specification in the presence of
two subscribing witnesses.

BERNDT ALFRED HOGLUND.

Witnesses:

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