

No. 755,944.

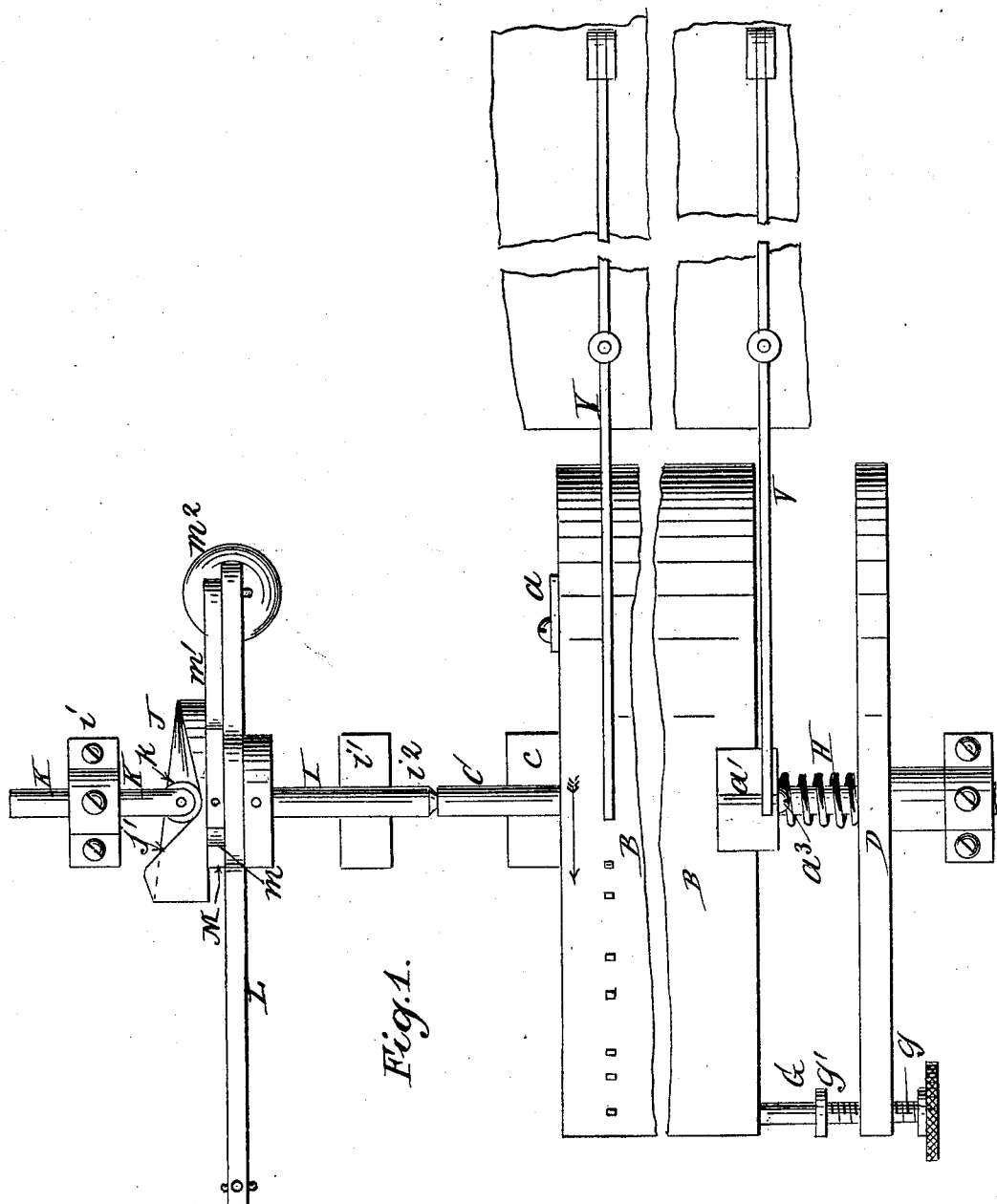
PATENTED MAR. 29, 1904.

F. SCHIPPERS.
PNEUMATIC MUSICAL APPARATUS.

APPLICATION FILED MAY 8, 1903.

NO MODEL.

5 SHEETS—SHEET 1.



Witnesses:

Wm. Gardner.
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Inventor:

Frank Schippers.
By his Attorney
Geo. Wm. Math

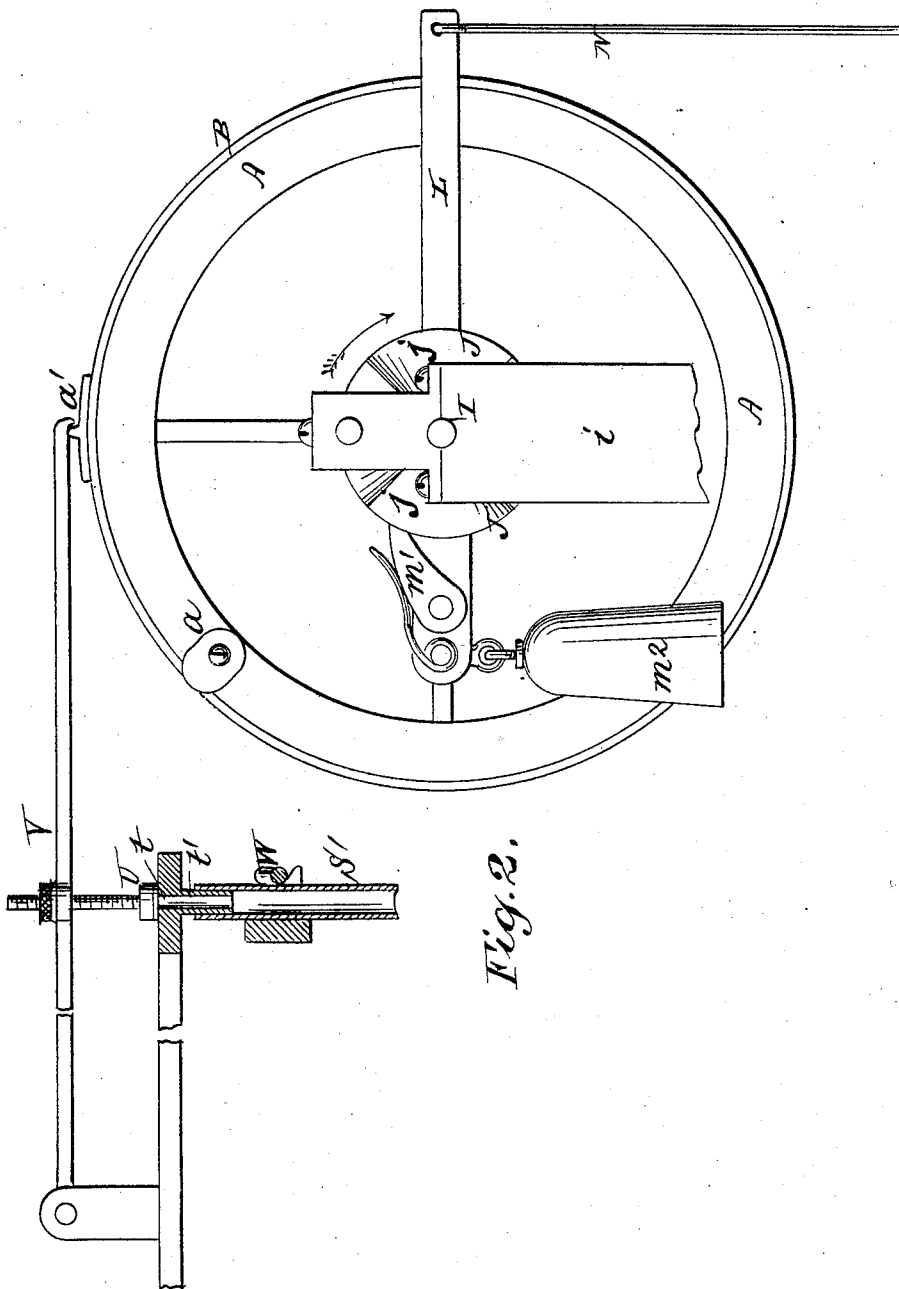
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5 SHEETS—SHEET 2.



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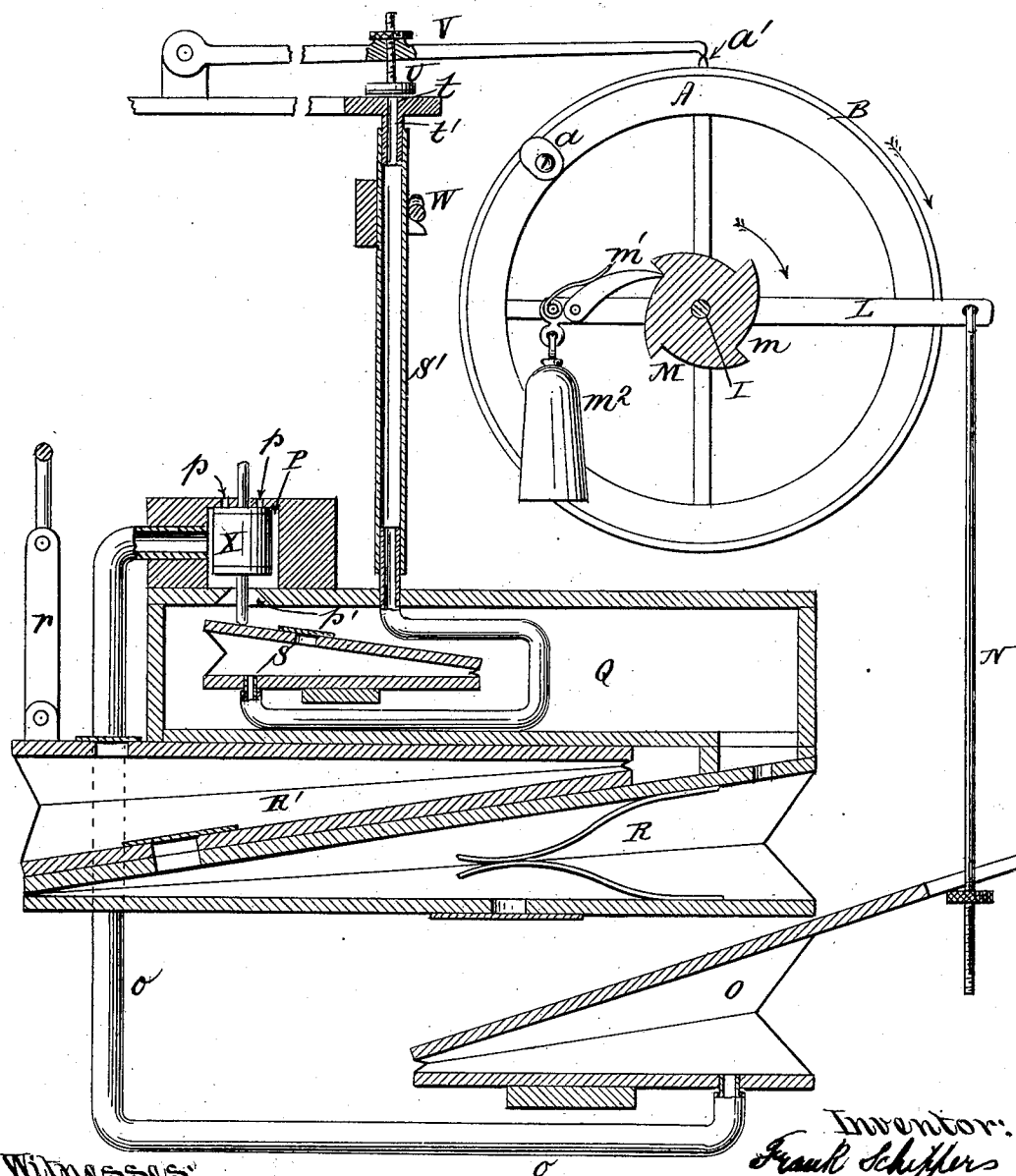
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5 SHEETS—SHEET 3.

Fig. 3.



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5 SHEETS—SHEET 4.

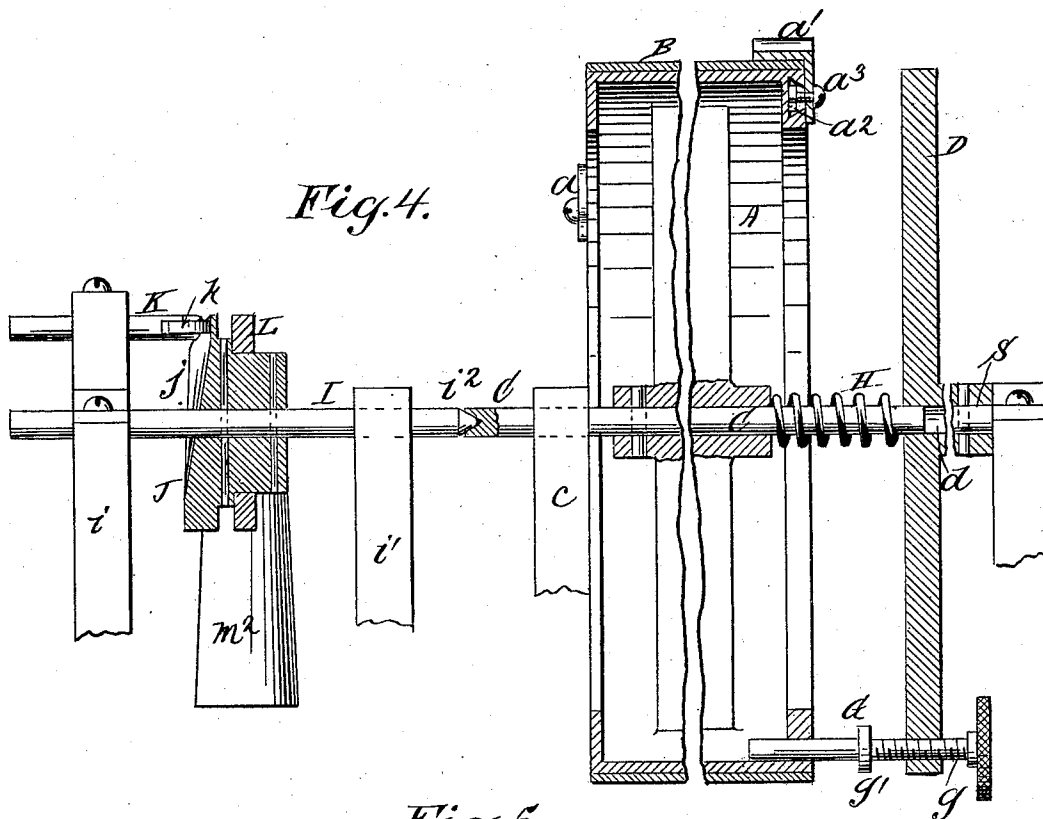


Fig. 5.

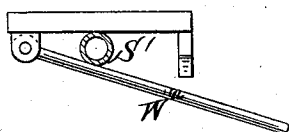
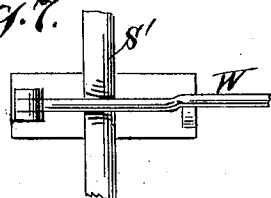


Fig. 6.



Fig. 7.



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5 SHEETS—SHEET 5.

Fig. 8.

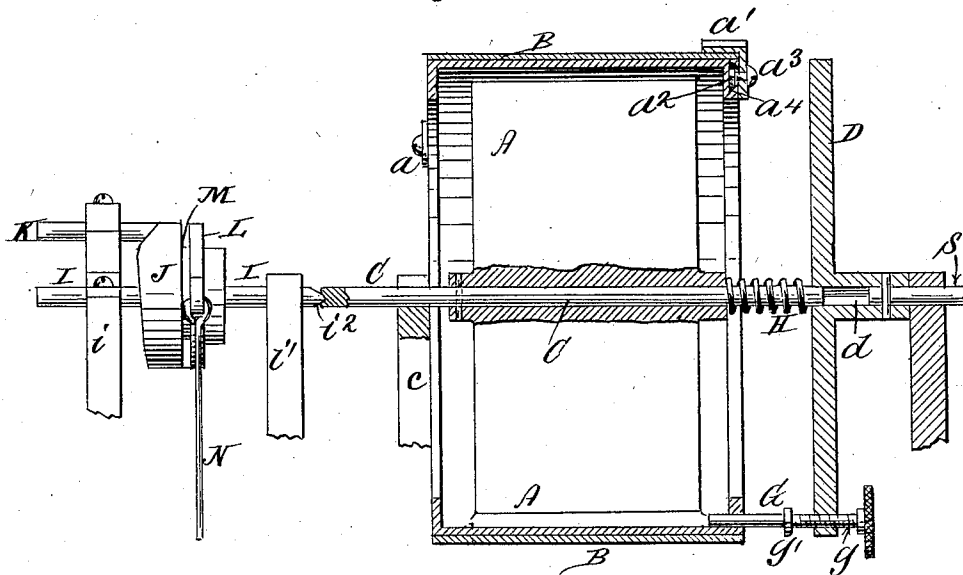


Fig. 9.

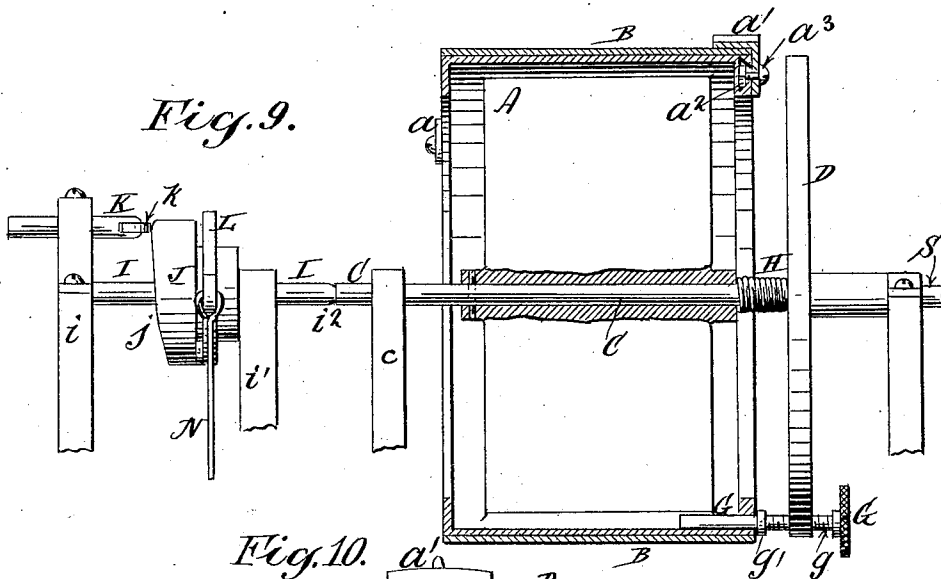
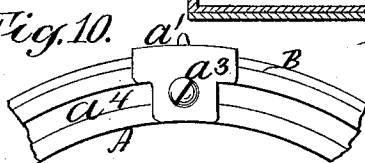


Fig. 10.



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UNITED STATES PATENT OFFICE.

FRANK SCHIPPERS, OF NEW YORK, N. Y., ASSIGNOR TO AMERICAN BELL
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PNEUMATIC MUSICAL APPARATUS.

SPECIFICATION forming part of Letters Patent No. 755,944, dated March 29, 1904.

Application filed May 8, 1903. Serial No. 156,200. (No model.)

To all whom it may concern:

Be it known that I, FRANK SCHIPPERS, a citizen of the United States, residing in the city of New York, borough of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Pneumatic Musical Apparatus, of which the following is a specification sufficient to enable others skilled in the art to which the invention appertains to make and use the same.

My invention relates to tune-shifting devices for use in automatic musical apparatus; and it consists in the special construction and arrangement of parts described and claimed herein specifically.

In the accompanying drawings, Figure 1 is a plan of the device and connections; Fig. 2, an elevation of the same, partly in section; Fig. 3, a sectional diagram showing the device connected with pneumatics; Fig. 4, a central longitudinal section partly broken away; Figs. 5, 6, and 7, detail views of the cut-off; Figs. 8 and 9, sectional elevations, upon a smaller scale, illustrating the action of the shifting mechanism; Fig. 10, a section of the periphery of the music-drum, showing the adjustable stop.

In the accompanying drawings, A represents a drum upon which the musical cylinder B is supported, it being held thereon by a latch *a* or other mechanical expedient. The drum A is rigidly attached to the shaft C, which is supported on one side by the pillow-block *c* and upon the other side by the disk D, which is formed with an axial recess *d* for the reception of the end of said shaft C, as will be understood by reference to Figs. 4 and 8. The disk D is rigidly secured to the end of the power-shaft S, to which motion is applied by any suitable means. The disk D and the drum A are coupled together by a stud G, the shank of which is formed with a screw-thread *g*, so that the shoulder *g'* may be adjusted with relation to the drum A to limit the motion of the latter, as hereinafter described. A spring H is interposed between the drum A and disk D and tends constantly to separate them. The drum A is formed

with a stop *a'*, which is made adjustable by any suitable means, as by a nut and set-screw *a'' a'''*, resting in the concentric slot *a⁴*.

I is a shaft resting in and supported by pillow-block *i i'* in such manner as to allow it to move longitudinally as well as to rotate upon its axis. The inner end *i''* of this shaft I, which may be designated as the "cam-shaft," rests against or engages with the opposed end of the drum-shaft C, so that the spring H tends constantly to press the cam-shaft I toward the left as the parts are arranged in the drawings. The cam J is rigidly secured to the shaft I and is formed with a spiral bearing-surface *j* and incline or drop *j'*, as shown in Fig. 1. This bearing surface or tread rests constantly by reason of the pressure of the spring H against a stop or stationary abutment K, preferably provided with a friction-roller *k*.

Forming a part of the hub of the cam J is the ratchet-wheel M, formed with four or more ratchet-teeth *m*. Fulcrumed on the hub of the ratchet M is the lever L, one arm of which carries the spring-pawl *m'*, and a counterweight *m''*, the opposite arm of the lever being connected by a rod N with the pneumatic O, communicating through the pipe *o* with the valve-chamber P, formed with the air-ports *p* and the valve-seats *p'* opening into the vacuum-chamber Q, from which the air is exhausted by the pneumatics R and R', actuated through the connection-rod *r* by suitable mechanism, as heretofore.

Situated in the vacuum-chamber Q is the pneumatic S, communicating with the flexible conduit S', which is attached to the valve-seat *t*, which valve-seat *t* is formed with the air-duct *t*, which is closed normally by the valve U, adjustably mounted upon the valve-lever V.

W indicates a lever or other suitable device for compressing the flexible tube S' when it is desired to cut off communication between the atmosphere and the pneumatic air-supply for the purpose of rendering the operation of the music-cylinder continuous.

The valve U is made adjustable upon its lever

V for the purpose of compensating for variations in the thickness of the music-cylinder B.

It is to be understood that the note-levers Y, only one of which is shown in Fig. 1, operate on the note projections upon the periphery of the music-cylinder B, as heretofore.

The operation is as follows: The parts being in the position shown in Fig. 1 and the line of motion being in the direction indicated by the arrows in the several figures, the rotation of the drum A and music-cylinder B by the power-shaft through the medium of the disk D and coupling G causes the note projections to operate the levers Y in the usual manner. The stop *a'* is so set that at the end of the tune it trips the lever V, thereby raising the valve X, as shown in Fig. 3, from the port *p'* and opening communication through the pipe *o* between the vacuum-chamber Q and the pneumatic O, which latter is thereby collapsed, causing the rod N to rock the lever L, so that the pawl *m'* will forward the ratchet M, causing the cam J to rotate against the resistance of the abutment K, and thereby force the hub A and cylinder B toward the right against the resistance of the spring H, when the hub and cylinder will make another revolution, playing another tune, at the end of which the operation is repeated by the tripping of the lever V and the forwarding of the music-cylinder by the cam J. At the end of the last tune the cam is forced back to its original position by the spring H by reason of the offset or drop *j'* upon the cam, bringing the cylinder B into position for the first tune, when the whole operation is repeated.

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

1. In combination with a shaft, a music-cylinder, mounted upon said shaft which latter is movable longitudinally, an auxiliary shaft abutting against the end of the shaft supporting the music-cylinder, a cam upon said auxiliary shaft, a stationary abutment engaging said cam, and means for pressing the cam against said stationary abutment whereby the music-cylinder is moved automatically to change the tunes, substantially in the manner and for the purpose set forth.

2. The combination of a shaft, the music-cylinder, mounted upon said shaft which latter is movable longitudinally, an auxiliary shaft, in line with said first-named shaft, a cam mounted rigidly on said auxiliary shaft, a stationary abutment for engaging said cam, a ratchet-wheel rigidly secured to said auxiliary shaft, a lever fulcrumed on said auxiliary shaft, and carrying a pawl for actuating said ratchet, a pneumatic apparatus, a stop on the cylinder, and a rod connecting said lever with said pneumatic apparatus, the latter being controlled by said stop on the music-cylinder,

whereby said cylinder is shifted automatically to change the tune, substantially as described.

3. The combination of the power-shaft S, disk D, formed with the axial recess, the sliding shaft C, carrying the drum A, and music-cylinder B, the spring H, the auxiliary shaft I, carrying the cam J, and ratchet M, the stationary abutment K, pneumatics, a trip on the music-cylinder, and the lever L, fulcrumed on said auxiliary shaft I, and connected with said pneumatics for actuating said lever by means of said trip on the music-cylinder, substantially as set forth.

4. The combination of the power-shaft S, the disk D, shaft C, carrying the drum A, and music-cylinder B, the coupling-pin G, connecting the said disk and drum A, said pin being formed with a screw-thread *g*, and stop *g'*, substantially as set forth.

5. The combination with the power-shaft S, the disk D, coupling-pin G, drum A, music-cylinder B, and the stop *a'*, made adjustable peripherally for the purpose described.

6. The combination of the power-shaft S, disk D, coupling-pin G, drum A, music-cylinder B, shaft C, spring H, cam-shaft I, abutment K, with the lever L, pneumatic mechanism, together with the trip-lever V, valve U, and duct *t*, for admitting air to said pneumatic mechanism by which the said lever L, is operated, substantially in the manner described.

7. The combination with the music-cylinder-shifting mechanism, pneumatics for operating the same, of a cut-off device to prevent the admission of air to the pneumatics when desired, substantially in the manner set forth.

8. In combination with a music-cylinder, and mechanism for operating the same, pneumatics, a trip-lever provided with a valve for controlling the admission of air to the said pneumatics, by which the shifting mechanism is operated, said valve being adjustable upon the lever for the purpose of compensating for variations in the thickness of the music-cylinder, substantially as described.

9. The combination with the pneumatics, the valve-lever and the drum, of a stop upon the drum and made adjustable upon the periphery thereof to cooperate with said lever, as and for the purpose specified.

10. The combination with the pneumatics, the trip-lever and valve, of the flexible tubing interposed between the pneumatics and the valve, and a cut-off device for compressing said flexible tubing to exclude the air from the pneumatics, as set forth.

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