

P. WELIN.
 PAPER WINDING MECHANISM FOR MUSICAL INSTRUMENTS.
 APPLICATION FILED APR. 2, 1910.

1,047,598.

Patented Dec. 17, 1912.

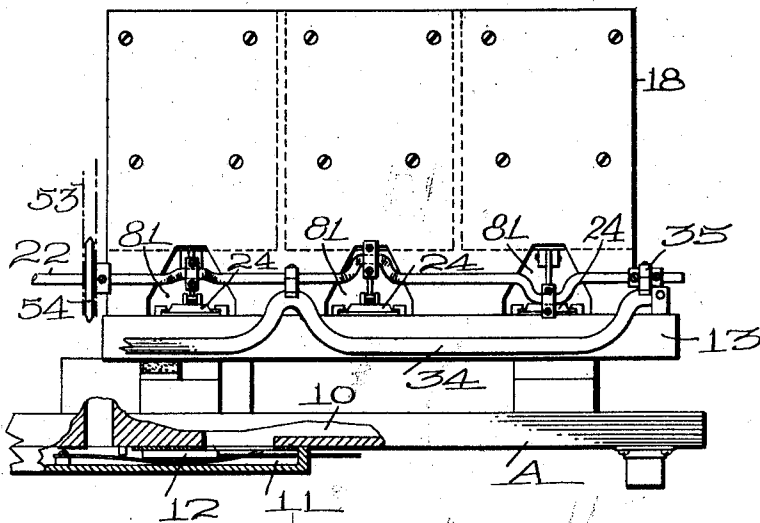


FIG. 1.

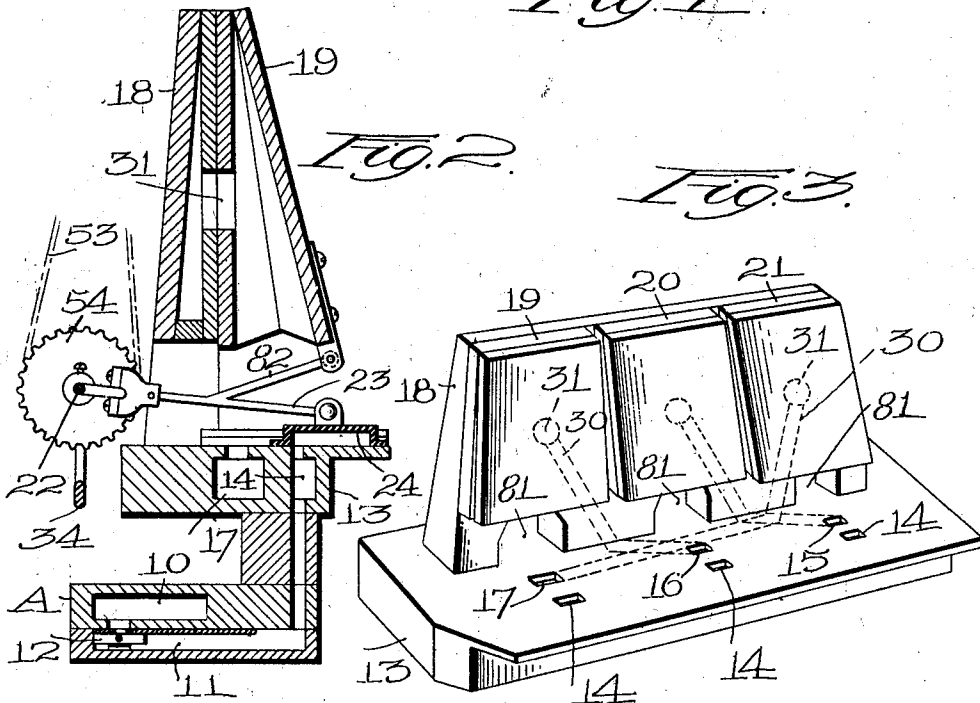


FIG. 2.

FIG. 3.

Witnesses:
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UNITED STATES PATENT OFFICE.

PETER WELIN, OF WORCESTER, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS,
TO KRELL AUTO-GRAND PIANO CO. OF AMERICA, A CORPORATION OF INDIANA.

PAPER-WINDING MECHANISM FOR MUSICAL INSTRUMENTS.

1,047,598.

Specification of Letters Patent.

Patented Dec. 17, 1912.

Original application filed February 24, 1903, Serial No. 144,676. Divided and this application filed April 2,
1910. Serial No. 552,964.

To all whom it may concern:

Be it known that I, PETER WELIN, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Paper-Winding Mechanism for Musical Instruments, of which the following is a specification.

This is a division of my Patent No. 943,802 granted December 21, 1909.

This invention relates to that class of automatic musical instruments which are controlled by rolls of perforated paper.

The especial objects of this invention are to provide a motor which will operate more smoothly and which will be more reliable than winding motors which have heretofore been employed.

To these ends, this invention consists of the paper winding mechanism for automatic musical instruments and of the combinations of parts therein as pointed out in the claims at the end of this specification.

In the accompanying drawing; Figure 1 is a front view of sufficient parts of a paper winding mechanism to illustrate the application of my invention thereto. Fig. 2 is an enlarged transverse sectional view of the same, and Fig. 3 is a perspective view of sufficient parts of the motor to illustrate the relation of the motor pneumatics and the passages which control said pneumatics.

In that class of musical instruments to which this invention relates the winding mechanism of most of the instruments have been driven by wind motors which have been operated by the suction of the bellows. A number of objections have been found to exist to the use of these wind motors as heretofore constructed. These objections have arisen partly from the fact that the motors of this class as heretofore constructed have not been perfectly balanced, that is to say, either the pneumatics or the controlling valves in this class of motors as heretofore constructed have been hung or connected to the motor crank shafts in such relation that the crank shafts would have to lift moving parts against force of gravity rendering the action of such motors somewhat jerky or non-uniform.

One especial object of my present invention is to overcome the objections heretofore existing to the use of wind motors by pro-

viding a construction of motor, having its parts perfectly counterbalanced with respect to its crank shaft and having a simple and reliable tension applying construction which will prevent the speed of the motor from varying.

Referring to the accompanying drawing for a detail description of a paper winding mechanism constructed according to this invention, A designates a base piece or board having a suction chamber 10.

Arranged below the suction chamber 10 and connected therewith by a port is a suction channel 11. The port between the passage 10 and suction channel 11 is controlled by a sliding valve 12 which may be partly opened to throttle the passage between the chamber 10 and suction passage 11 to regulate the speed of the motor. Supported on the base-plate A and at a distance above the same is a board 13. The board 13 as illustrated is provided with valve openings 14 connected to the suction channel 11 and with valve ports which connect the motor pneumatics.

Fig. 3 illustrates the arrangement of the valve ports 15, 16 and 17 and the passages which connect the ports with the motor pneumatics. As shown in this figure the motor preferably comprises three vertically arranged motor pneumatics 19, 20 and 21. The port 15 at one end instead of being connected to the adjacent end pneumatic 21 is connected to the center pneumatic 20. The central valve port 16 is connected to the end pneumatic 19 through a channel and port 31, and the valve port 17 is connected to the pneumatic 21 at the opposite end of the construction. This cross channel construction of the valve ports in a wind motor is important because the swinging section of each motor pneumatic moves synchronously and in the same direction with the slide valve which is arranged below the same, and by this construction the valve, instead of controlling the motor with which it moves, controls one generally moving oppositely or at a different speed. This results in a tendency to balance the resistance of the moving parts.

The motor pneumatics 19, 20 and 21 are supported by a vertical back piece or board 18 which is provided with openings 81 opposite each set of valve ports. The mov-

able section of each pneumatic is connected by a pitman 82 with the crank shaft 22 on the opposite end of the construction from the pneumatics. Operated by an arm 23, extending from the pitman 82 is a slide valve 24. In this construction it will be seen that the motor pneumatics and their controlling valves are connected with the motor crank shaft in such a manner that none of their weight is hung upon or supported from said crank shaft. This is regarded as a feature of particular advantage in a motor for paper winding mechanisms as in all such motors as heretofore constructed the controlling valves have been operated with lines of travel at right angles to the plane of movement of the swinging sections of the motor pneumatic and it has resulted from this that the unbalanced weight of moving parts has been necessarily supported or hung on a motor crank shaft.

For example when motors of such construction are set horizontally the weight of the movable sections of the pneumatics will hang upon the crank shafts and when such motors are arranged vertically the weights of the controlling valves will hang upon the crank shafts whereas in a motor constructed according to this invention the weights are perfectly counterbalanced with respect to the crank shaft and a perfectly reliable uniformity of rotation of the crank shaft is secured.

A swinging frame 34 on the board 13 is provided with bearings 35 in which the motor crank shaft 22 is journaled. On this shaft is a chain wheel 54 operated by a chain 53. The arrangement of music rolls and tracker board may be substantially the same as in other instruments in this class. This tilting construction prevents the two gears which mesh to operate the crank shaft from getting locked together, and removes the strain from them. Moreover only one belt is used, doing away with the counter-shaft and on the rewinding the belt is given more tension.

While I have illustrated and described a preferred embodiment of the invention, I am aware that many other modifications can be made therein by any person skilled in the art without departing from the scope of the invention as expressed in the claims. Therefore, I do not wish to be limited to all the details of construction shown and described but

What I do claim is:—

1. In a motor mechanism for musical instruments, the combination of a plate or

board having an air channel therein, a pneumatic located on one side of said plate or board and having a movable leaf, a valve located on the same side for controlling the air channel, a crank shaft located on the other side of said plate or board, and a pitman connected directly to said crank shaft, movable leaf, and valve.

2. In a paper winding mechanism for automatic musical instruments, the combination of a crank shaft, a plurality of motor pneumatics, and a controlling valve moving with each of said pneumatics and arranged to control the operation of some other one of said pneumatics.

3. In a paper winding mechanism for automatic musical instruments, the combination of a vertical support or board, a crank shaft on one side of the support, a plurality of vertically arranged pneumatics on the other side of the support, horizontally movable controlling valves on said other side, means extending from the crank shaft to the other side of the support or board for connecting it with the pneumatics and valves, said parts being arranged so that the weight of said means will not be hung upon the crank shaft.

4. In a paper winding mechanism for automatic musical instruments, the combination of a crank shaft, a plurality of vertically arranged motor pneumatics, and a horizontally movable valve operated by each of said pneumatics, and connected to control some other one of said pneumatics, said parts being arranged so that their weight will not hang upon the crank shaft.

5. In a paper winding mechanism for automatic musical instruments, the combination of a vertical board or support, a crank shaft on one side of the vertical board or support, a plurality of motor pneumatics on the other side of the vertical board or support, pitmen extending through holes in the vertical board or support and connecting the movable sections of the motor pneumatics with the crank-shaft, and a controlling valve connected to be operated by each of said pitmen, each of said controlling valves being connected to control some other one of the pneumatics than the one which moves in unison therewith.

In testimony whereof I have hereunto set my hand, in the presence of two subscribing witnesses.

PETER WELIN.

Witnesses:

R. E. FAY,
C. F. WESSON.