

No. 757,095.

PATENTED APR. 12, 1904.

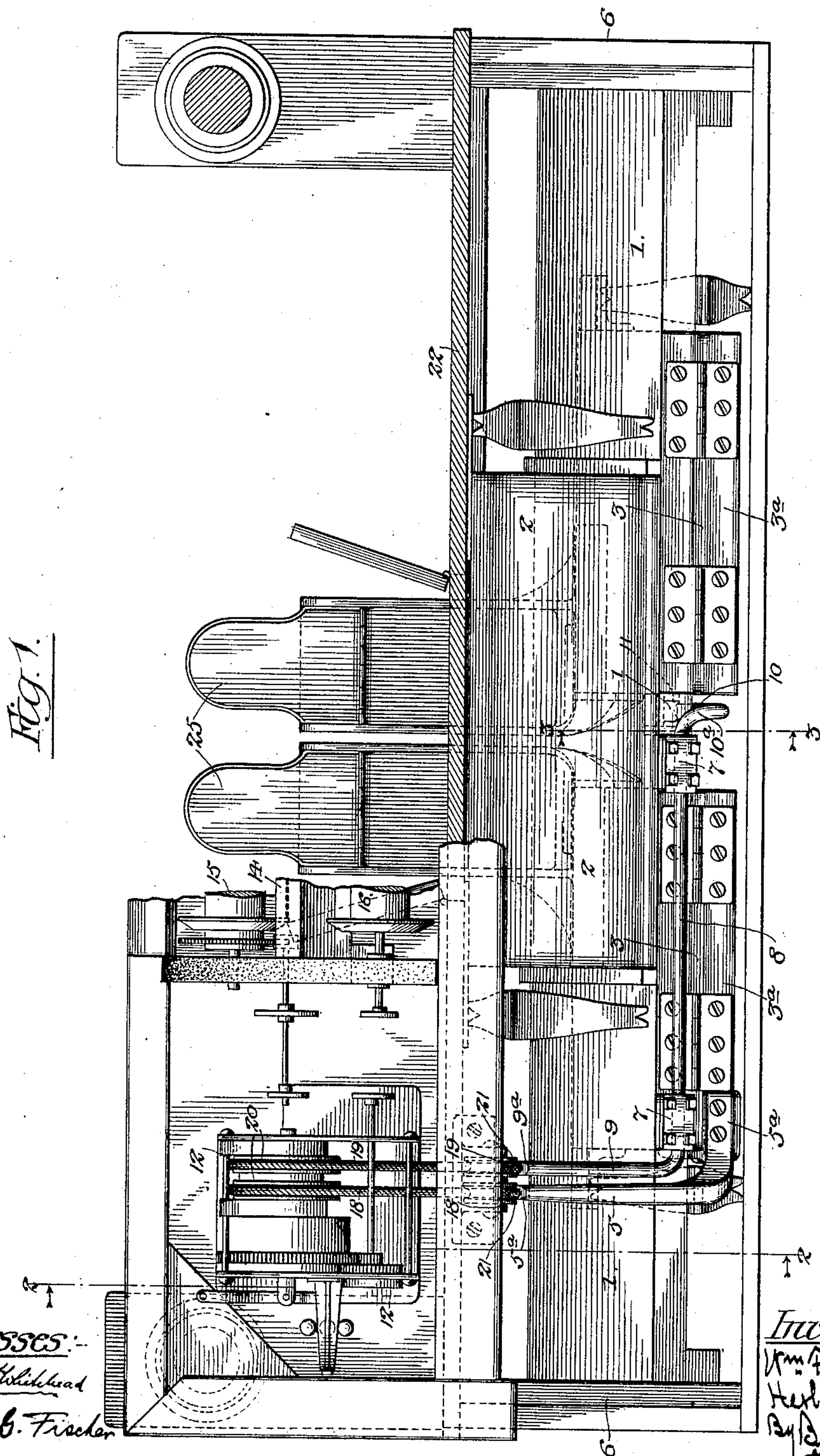
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WINDING DEVICE FOR AUTOMATIC MUSICAL INSTRUMENT MOTORS.

APPLICATION FILED DEC. 21, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses:

Louis M. Whitehead

Fred B. Fischer

Inventors:

Wm. F. Cooper, Jr.

Herbert E. Sharpe

By Burton Burton

their attys.

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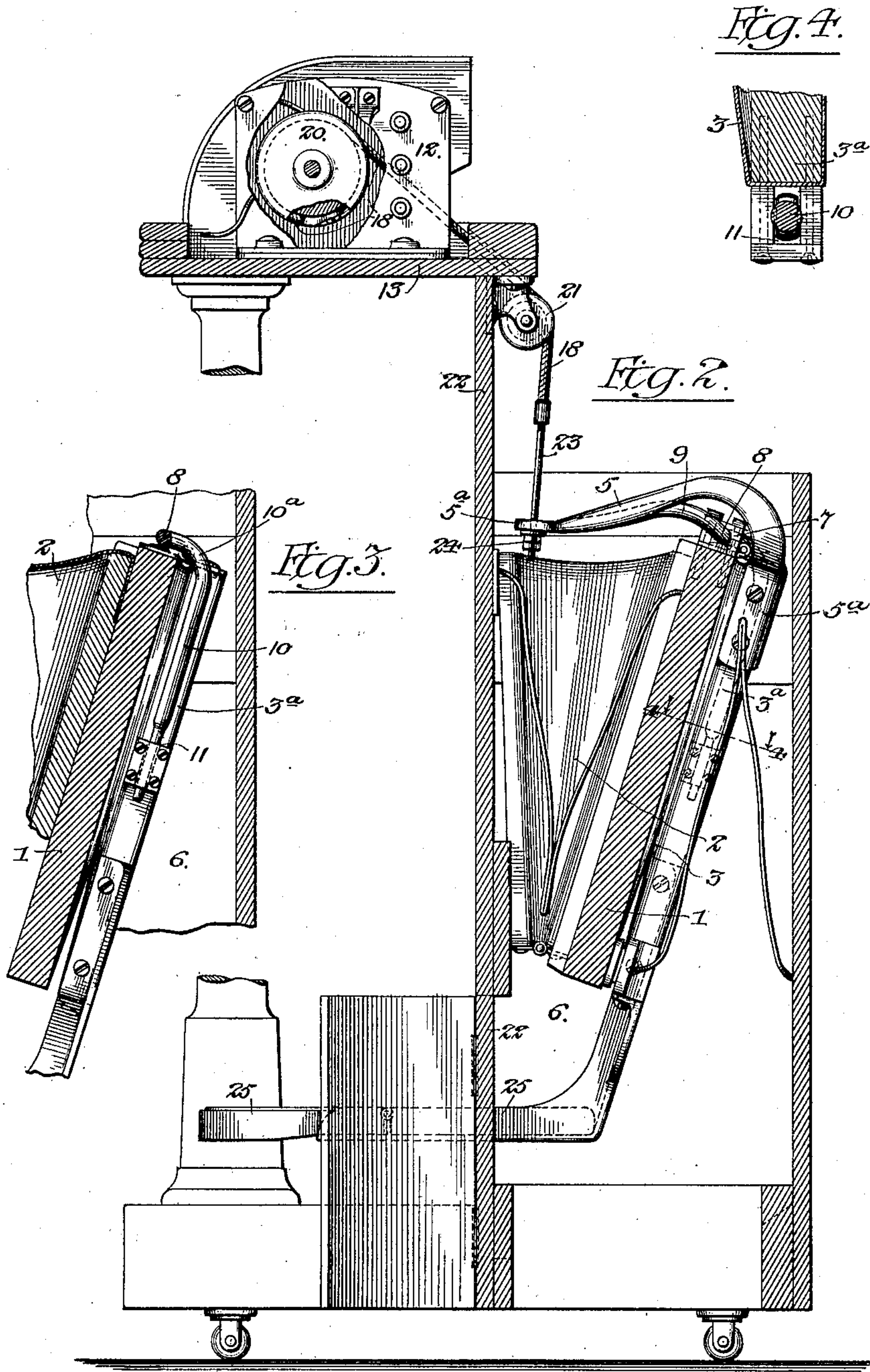
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Wm. H. F. Whitehead

Fred. G. Fischer

Inventors:-

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UNITED STATES PATENT OFFICE.

WILLIAM F. COOPER, JR., AND HERBERT E. SHARPS, OF CHICAGO, ILLINOIS,
ASSIGNORS TO THE CABLE COMPANY, A CORPORATION OF ILLINOIS.

WINDING DEVICE FOR AUTOMATIC MUSICAL-INSTRUMENT MOTORS.

SPECIFICATION forming part of Letters Patent No. 757,095, dated April 12, 1904.

Application filed December 21, 1903. Serial No. 186,726. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM F. COOPER, Jr., and HERBERT E. SHARPS, citizens of the United States, residing at Chicago, county of Cook, and State of Illinois, have invented new and useful Improvements in Winding Devices for Automatic Musical-Instrument Motors, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

This invention relates to means for winding a mechanical motor whose function is to operate the controlling devices of an automatic player or musical instrument by means of the foot-operated devices for supplying the instrument with air, either for operating the automatic mechanism which controls the sounding devices or for operating the sounding devices. It is shown in connection with an automatic piano-player, in which the air is supplied for the purpose of operating the automatic playing mechanism; but it is not limited to use in this particular situation.

It consists in the features of construction set out in the claims.

In the drawings, Figure 1 is a plan view of a piano-player having the motor wound by means of our invention, the rollers, tracker-range, and case being in part broken away to disclose the pedals. Fig. 2 is a sectional elevation at the line 2 2 on Fig. 1. Fig. 3 is a detail section at the line 3 3 on Fig. 1. Fig. 4 is a detail section at the line 4 4 on Fig. 2.

In the drawings, 1 is the "foundation-board," so called, upon which, at the forward side, there is mounted the exhaust-bellows 2 or chamber from which the air is exhausted or in which it is maintained in rarefied condition by the pumpers 3 3, which are hinged to the rear side of said foundation-board.

This construction is a common one in musical instruments, and we adopt it in this instance for the purpose of utilizing certain features of it for our present invention. From the upper end of the oscillating side 3^a of the right-hand pumper the lever-arm 5 is extended forward, being attached by an angle-flange 5^a, which clasps the upper right-hand corner of said board to obtain fastening on

both edges, the arm extending up a little from the angular fastening, so as to overhang and extend forward above the upper edge of the foundation-board, because it is desirable to avoid notching this board or otherwise in any manner weakening it at this point. The foundation-board, it will be understood, extends to the ends 6 6 of the case for rigid attachment thereto and necessarily is exposed to the stress in both directions of the action of the pumpers 3 and exhaust-bellows 2. Upon the upper edges of the foundation-board 1 there is mounted in journal-bearings 7 7 a rock-shaft 8, having at the upper right-hand end a forwardly-projecting lever-arm 9, corresponding to the lever-arm 5 and extending approximately parallel therewith. At the other end of the shaft 8 it has a rigid arm 10 bent off rearward for a distance sufficient to extend beyond the rear plane of the foundation-board, said arm being then bent downward at the portion 10^a, extending along the right-hand edge of the oscillating side 3^a of the left-hand pumper. The arm 10 is engaged with the pumper-board 3^a by its lower end, which is thrust into an eye 11, formed at the edge of said board and projecting beyond the bellows' sides for that purpose. The axis of the shaft 8 with this construction is only a short distance out of line with the hinge of the right-hand board 3^a, and as the swinging of the right-hand board 3^a vibrates the lever-arm 5 up and down at its forward end so the swinging of the left-hand board 3^a by the engagement of the arm 10^a with the eye 11 on said left-hand board 3^a rocks the shaft 8 and vibrates the lever-arm 9 at its forward end similarly and to substantially equal extent.

The motor, represented conventionally and in outline only, (indicated by numeral 12,) is mounted upon the platform-board 13 in a position at one side—preferably, as shown, the right-hand side—of the tracker-range 14 and rolls 15 and 16, which carry the controlling-sheet. The tracker-range rolls and controlling-sheet, as well as the motor, are shown only conventionally and partially, the only purpose of showing them being to indicate the

relative position of said parts with respect to those concerned in the present invention.

The drawings illustrate a motor of the type shown in our Patent No. 697,754, dated April 15, 1902, the details of which it is not necessary to illustrate or explain in this application further than to point out that it is wound by means of cables 18 and 19, extending from winding-pulleys 20 20 of the motor back and down about suitable guide-pulleys 21 21, mounted on the platform-board and guiding said cables into the rear part of the case behind the forward screen-board 22. The cable 18 is connected by a link 23 to the forward end of the lever-arm 5 of the right-hand pumper-board 3^a and the cable 19 by a similar link 23 to the lever-arm 9 of the rock-shaft 8, which is operatively connected with and actuated by the left-hand pumper-board 3^a, as described.

When the motor is wound tight—that is, to the maximum tension for which the winding devices are adapted—the continued action of the pumpers no longer having any effect on the winding-pulleys the back-and-forth play of the levers 5 and 9 would simply take up and straighten the slack of the cables if the ends of the cables were positively attached to the levers. Preferably for strength the cables are of material not extremely pliable, and the stiffness of the cables, while not so great as to interfere with their operating properly around the guide-pulleys and the winding-pulleys when performing the work of winding when they are under tension to the extent of the tension of the springs which are being wound, is nevertheless such that if the play operated merely to take up and straighten the slack of the cables there would be liability to lift them out of the grooves of the guide-pulleys or winding-pulleys or of otherwise displacing them from proper position for winding. To avoid, therefore, such action on the cables, we provide for the play of the lever with respect to the connections by which it operates the cables by extending the links 23 23 from the cables 18 and 19 through eyes 5^a and 9^a in the ends of the levers 5 and 9, respectively, through which the links play loosely and freely and furnishing the links beyond the eyes with stop-nuts 24, which may be adjusted to take up any slack in the cables and otherwise to cause the parts to act snugly in winding. We have shown the oscillating boards 3^a 3^a of the pumpers provided at their lower ends with the rigidly-attached and forwardly-projecting pedals 25 25 for operating the pumpers by oscillating action of such rigidly-mounted pedals; but for the purpose of the present invention in one aspect the mode of actuating the oscillating boards of the pumpers is not essential, and other connection might be employed from a differently-mounted pedal for that purpose. However, on the other hand, the same action

of the winding mechanism might be obtained by a pedal hinged at an elevated point corresponding to the position of the hinge of the oscillating board 3^a of the pumpers, and from this point of view the pedal 25 and board 3^a may be considered as one element, since they are, in fact, rigid, and that element be regarded as the pedal, disregarding in this aspect of the invention the function of the board 3^a as being a part of the pumper. We consider our invention, therefore, broadly, to involve the employment of a pedal hinged at an elevated point and having at such elevated point or near it a lever-arm for connection with the winding-cable and as involving also in the construction shown the utilizing of the oscillating board of the pumper for operating the winding mechanism by means of a lever-arm on said oscillating board, as described.

Specifically, the invention involves the two features above mentioned in one structure in which the pedal, broadly considered, comprises as a rigid part necessary for its operation the oscillating pumper-board and the extension of the lever-arm from the oscillating board of the pumper as a specific construction involving extending such lever-arm from the pedal. We do not limit ourselves, therefore, to either construction specifically nor to the construction in which both features are present at the same time.

We claim—

1. In an automatic musical instrument, in combination with the pumper, a motor; winding-cables therefrom; a pedal for operating the pumper having rigid with it a part extending upward and fulcrumed at its upper end near the upper part of the instrument; a lever-arm extending rigidly forward from said upwardly-extending part near its fulcrum, and connected to the cable.

2. In an automatic musical instrument, in combination with a motor having cables for winding it, a pumper for operating the instrument having its oscillating board hinged at the upper end near the upper part of the instrument; a lever-arm extending forward from said upper end and connected with the cables, and means for operating the pumper.

3. In an automatic musical instrument, in combination with a motor having a cable for winding the same, the pumper having its oscillating board hinged at the upper end and swinging back and forth at the lower end, the pedal rigid with said lower end projecting forward therefrom, and a lever-arm rigid with the upper end projecting forward therefrom and connected to the cable.

4. In an automatic musical instrument, in combination with the pumper, a motor having cables for winding the same, a foot-actuated element for operating the pumper hinged at its upper end toward the upper part of the instrument and oscillating back and forth below such hinge; a lever-arm extending rigidly

forward from the upper end of said oscillating element; a link extending from the cable loosely through an eye in said lever-arm, and a stop on the link beyond the eye.

5 5. In an automatic musical instrument, in combination with the motor having cables for winding the same; the pumper comprising a foot-actuated element fulcrumed at the upper part of the instrument, farther rearward than
10 the motor; a lever-arm extending forwardly therefrom; a link connected with the winding-cable and extending loosely through an eye on said lever-arm and provided with a stop beyond the eye.

15 6. In an automatic musical instrument, in combination with a motor having two cables for winding the same; the foundation-board of the pneumatic action rigid with the case, the pumpers having their oscillating boards
20 hinged to said foundation at the upper edge; a rock-shaft mounted upon the foundation-board having at one end a lever-arm connected with the oscillating board by one of the pumpers for rocking said shaft as the pumper-board oscillates, and having at the other end
25 an upwardly-extending arm connected with one of the motor-winding cables.

7. In an automatic musical instrument, in combination with a motor having cables for winding the same, the foundation-board for
30 the exhaust-chamber rigid with the case, the pumpers at the rear side of such foundation-board having their oscillating boards hinged thereto at the upper edge, one of said oscillating boards having a rigid lever-arm projecting forward from its upper end; a rock-shaft journaled upon the upper edge of the foundation-board and having at one end a lever-arm extending substantially parallel with
35 the oscillating board of the other pumper, and operatively engaged therewith, and at the other end a lever-arm extending forwardly, said two forwardly-extending lever-arms being connected to the motor-winding cables respectively.
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In testimony whereof we have hereunto set our hands, in the presence of two witnesses, at Chicago, Illinois, this 7th day of December, A. D. 1903.

WILLIAM F. COOPER, JR.
HERBERT E. SHARPS.

In presence of—

CHARLES S. BURTON,
FRED G. FISCHER.