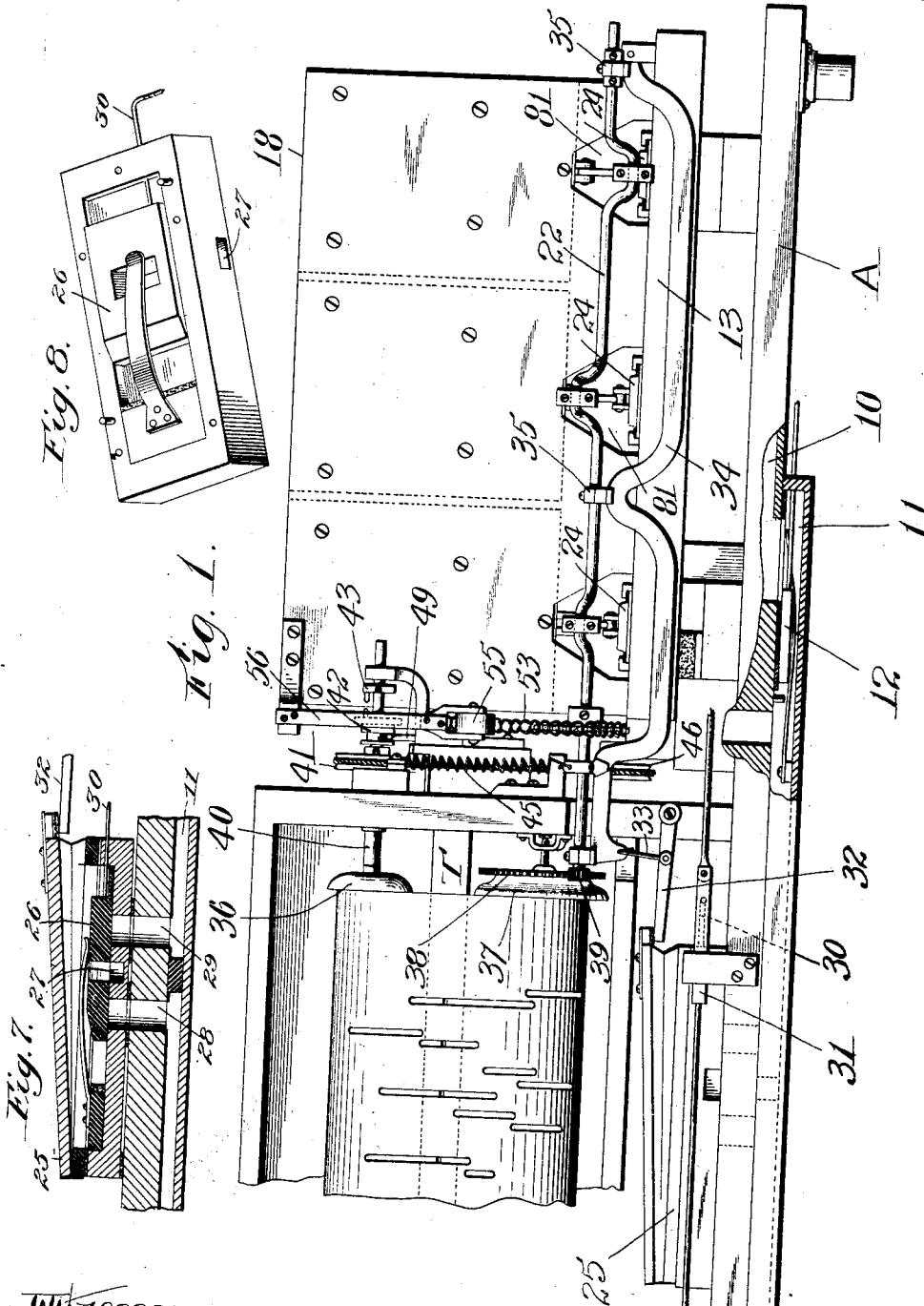


943,802.

Patented Dec. 21, 1909.

2 SHEETS—SHEET 1.



Witnesses:
 G. F. Wesson,
 M. E. Regan.

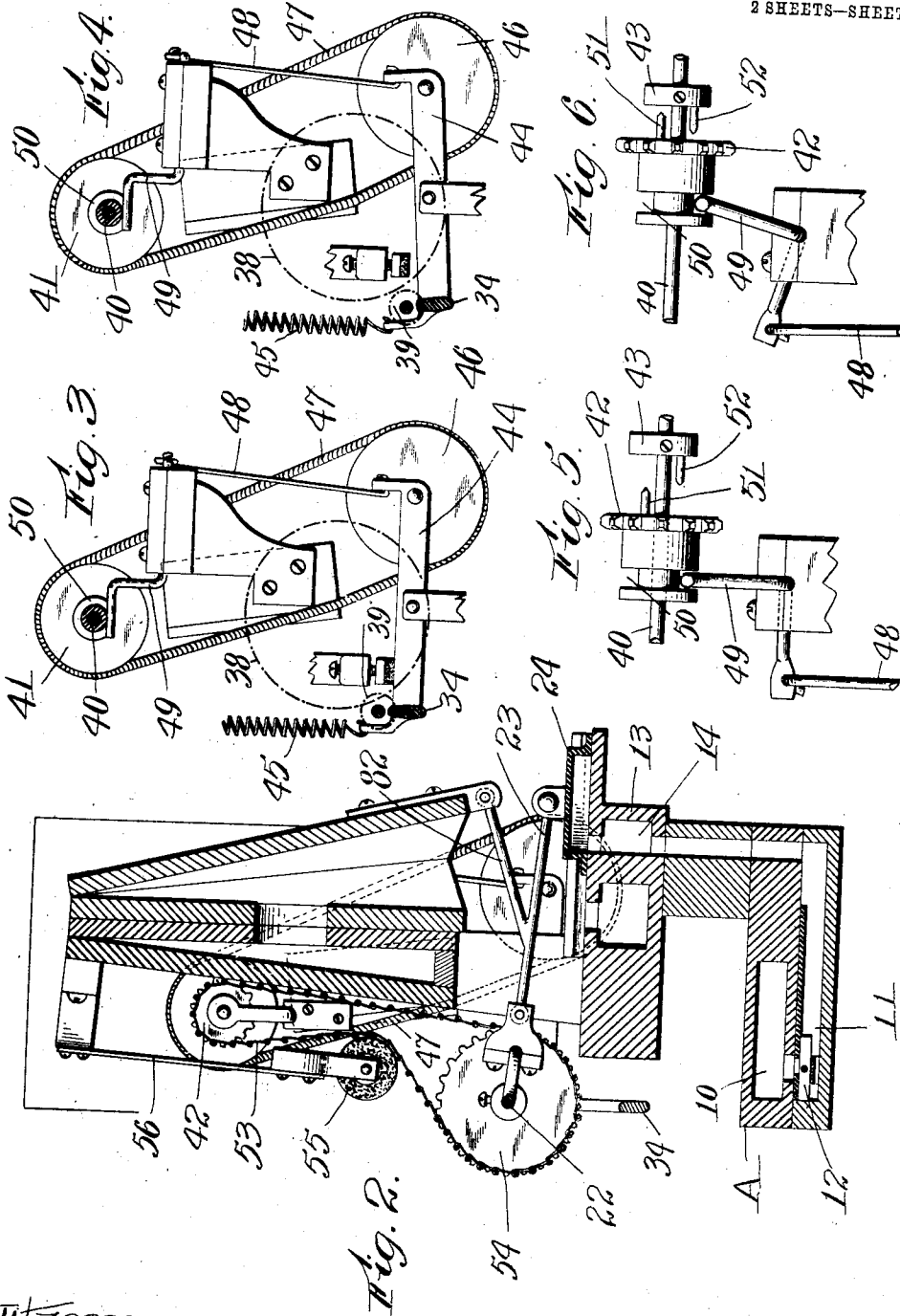
Inventor:
 Peter Welin.
 By his Attorneys,
 Southgate & Southgate

P. WELIN.
 PAPER WINDING MECHANISM FOR MUSICAL INSTRUMENTS.
 APPLICATION FILED FEB. 24, 1903. RENEWED JUNE 15, 1909.

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2 SHEETS—SHEET 2.



Witnesses:
 G. F. Wasson.
 M. E. Regan.

Inventor:
 Peter Welin.
 By his Attorneys,
 Southgate & Southgate

UNITED STATES PATENT OFFICE.

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

PAPER-WINDING MECHANISM FOR MUSICAL INSTRUMENTS.

943,802.

Specification of Letters Patent. Patented Dec. 21, 1909.

Application filed February 24, 1903, Serial No. 144,676. Renewed June 15, 1909. Serial No. 502,332.

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 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 pneumatic reversing connection for re-winding the paper on the music rolls; to provide a regulating belt for tensioning the paper and furnishing a uniform resistance during the forward winding of the music which regulating belt is relaxed during re-winding; to provide a re-winding chain which is relaxed or left loose while the paper is being wound forward and which has an increased tension while the paper is being re-wound.

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

In the accompanying three sheets of drawings, 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. Fig. 3 is a fragmentary end view. Fig. 4 is a view similar to Fig. 3, showing the parts in a different relative position. Fig. 5 is a detail view of the re-winding chain wheel. Fig. 6 is a similar view showing the chain wheel thrown into driving position. Fig. 7 is a sectional view of the pneumatic for operating the reversing devices, and Fig. 8 is a perspective view of the valve which controls the reversing pneumatic.

Referring to the accompanying drawings for a detail description of a paper winding mechanism constructed according to my invention as illustrated in Fig. 1, 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 suc-

tion 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 most clearly in Fig. 2 is provided with valve openings 14 connected to the suction channel 11 and with valve ports which connect the motor pneumatics. Any desired type of motor may be employed, one being shown comprising a back-piece 18 and one or more motor pneumatics 21. The movable 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 and operated by an arm 23; extending from the pitman 82 is a slide valve 24. I do not herein claim the motor and its connections, however, as the same form the subject of a separate invention which I intend to present in a divisional application.

To reverse the winding of the music I preferably provide connections which are pneumatically controlled.

As shown in Fig. 1, a reversing pneumatic 25 is arranged horizontally upon the base-plate A. As shown most clearly in Fig. 7 the reversing pneumatic 25 is provided with a valve 26 controlling the port 27 which is connected to the atmosphere and the ports 28 and 29 which connect with the suction passage 11; the valve 26 is connected by a rod 30 to a slide 31, shown in Fig. 1, which slide 31 may be shifted whenever it is desired to reverse the winding mechanism. The movable section of the reversing pneumatic 25 engages a lever 32 which is connected by a link 33 to the swinging frame 34. The swinging frame 34 is provided with bearings 35 in which the motor crank shaft 22 is journaled. The arrangement of music rolls and tracker board may be substantially the same as in other instruments in this class. As shown in Fig. 1 the music sheet is wound from a music roll 36 over a tracker-board T and onto a winding roll 37.

Carried by the winding roll 37 is a gear 38 which normally meets with and is driven by a pinion 39 on the end of the motor crank shaft 22. Connected with the shaft of the

music roll 36 is a reversing stud or shaft 40 mounted on which is a tension belt pulley 41 and a reversing chain wheel 42 which is movable to cooperate with a fixed collar 43.

5 The operation of the reversing connections is illustrated most clearly in Figs. 2 to 6. As shown in Fig. 3 a pivotally supported arm 44 extends back from the rocking frame 34, which rocking frame 34 is normally held
10 up by a spring 45. Journaled at the rear end of the arm 44 is a belt wheel 46. The belt wheel 46 and the belt wheel 41 before referred to, are grooved to receive a spiral spring tensioning belt 47. When the parts
15 are in the position illustrated in Fig. 3 the spiral spring tensioning belt is held sufficiently tight in its pulleys to impart the proper tension to the music sheet and to prevent the motor from racing or operating unevenly. The rear end of the arm 44 is connected by a link 48 to a rock-shaft having a crank arm 49 engaging a slot 50 in the hub of the reversing chain-wheel 42. As shown
20 in Figs. 5 and 6 the chain-wheel 42 is provided with a pin 51 which is arranged to engage with a pin 52 extending in from the collar 43. As shown in Fig. 2 a chain 53 runs on the chain-wheel 42 and around the chain-wheel 54 on the motor crank shaft 22. The chain 53 is normally quite loose and is held tightly in place by a guide wheel 55 carried by a spring arm 56; said parts being arranged so that the chain 53 will run easily while the music is being played and so that
30 the tension of the chain will be increased when the music is being re-wound. In the operation of the reversing connections as thus arranged when the reversing pneumatic is operated the driving pinion on the end of
35 the crank shaft will be thrown out of gear with the gear on the driving roll as illustrated by the dotted lines in Fig. 4. At the same time the tension of the spiral spring belt 47 will be relaxed to permit the music
40 to be re-wound without restraint while at the same time the driving chain 53 will be tightened and an efficient re-wind secured.

I am aware that numerous changes may be made in practicing my invention by those
50 who are skilled in the art and that certain features of my construction may be used in different combinations and in different locations without departing from the scope of my invention as expressed in the claims. I do not wish therefore to be limited to the constructions I have herein illustrated and described but

What I do claim and desire to secure by Letters Patent of the United States is:

60 1. In a paper winding mechanism for automatic musical instruments, the combination of a tracker-board, a motor, having a shifting crank-shaft, a winding train comprising a winding roll and gears connecting
65 the winding roll with the crank-shaft, a re-

winding train comprising a chain and sprocket wheels driven from the motor crank-shaft, and means for moving the crank shaft to uncouple the driving train, and to connect the driven sprocket wheel of the re-winding train with the re-winding shaft. 70

2. In a paper-winding mechanism for automatic musical instruments, the combination of a tracker-board, a motor, a flexible tension belt and means whereby said belt
75 places the music-sheet under tension and prevents unevenness of operation of the motor when the music-sheet is being wound in one direction, and whereby said belt is relaxed when the music-sheet is being re-
80 wound.

3. In a paper winding mechanism for automatic musical instruments, the combination of a tracker-board, a motor, having a
85 shiftable crank-shaft, a tensioning belt, and means for shifting the motor crank-shaft for re-winding the paper and simultaneously relaxing the tensioning belt.

4. In a paper winding mechanism for automatic musical instruments, the combination
90 of a tracker-board, a motor, a re-winding train operated by said motor, and comprising a chain and sprocket-wheels, and means for tightening the chain when the perforated paper is being re-wound. 95

5. In a paper winding mechanism for automatic musical instruments, the combination of a tracker-board, a motor having a
100 shiftable crank-shaft, a re-winding train comprising a chain and sprocket-wheels, a spring pressed roller engaging the driving chain, and means for shifting the crank-shaft when the paper is to be re-wound, the shifting of said crank-shaft operating to
105 tighten the chain.

6. In a paper winding mechanism for automatic musical instruments, the combination of a tracker-board, a motor having a
110 shiftable crank-shaft, a re-winding train comprising a driving chain and sprocket wheels, a tensioning belt controlling the motor while the paper is being wound in one direction, and means for shifting the crank-shaft when the paper is to be re-wound, said
115 means operating to tighten the driving chain during re-winding, and to relax the tensioning belt.

7. In a paper winding mechanism, the combination of winding and rewinding rollers, means for operating said rollers, a
120 tensioning belt adapted to apply tension when the mechanism is operating to wind the paper, and means for slackening the belt to relax the tension when it is operated to
125 rewind.

8. In a winding mechanism, the combination of a movable shaft, a rewinding shaft, a pulley on the rewinding shaft, a movable
130 arm, a pulley on said arm, and an elastic belt connecting said pulleys, said arm being con-

ected with said first named shaft whereby the movement of said shaft will control the tightness of the belt on said pulleys.

5 9. In a winding mechanism, the combination of a swinging frame, a shaft journaled thereon, a take-up roll, means mounted on the shaft for rotating the take-up roll, and pneumatically controlled means for swinging
10 said frame to disconnect it from the take-up roll.

15 10. In a winding mechanism, the combination of a movable frame, a shaft journaled thereon, a pinion on the shaft, a take-up roll, a gear connected with said take-up roll and adapted to mesh with said pinion to receive power therefrom, a link depending from the frame, and a pneumatic connected with said link for moving the frame when the pneumatic is collapsed.

11. In a winding mechanism, the combination of a frame pivoted at one end, a shaft journaled thereon, a pinion on the shaft, a take-up roll, a gear connected with said take-up roll and adapted to mesh with said pinion to receive power therefrom, and pneumatically controlled means connected with the free end of said frame for swinging the frame about its pivot, whereby the shaft may be moved so as to be connected with, and disconnected from, the take-up roll. 20 25 30

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

PETER WELIN.

Witnesses:

PHILIP W. SOUTHGATE,
JOHN F. CROWELL.