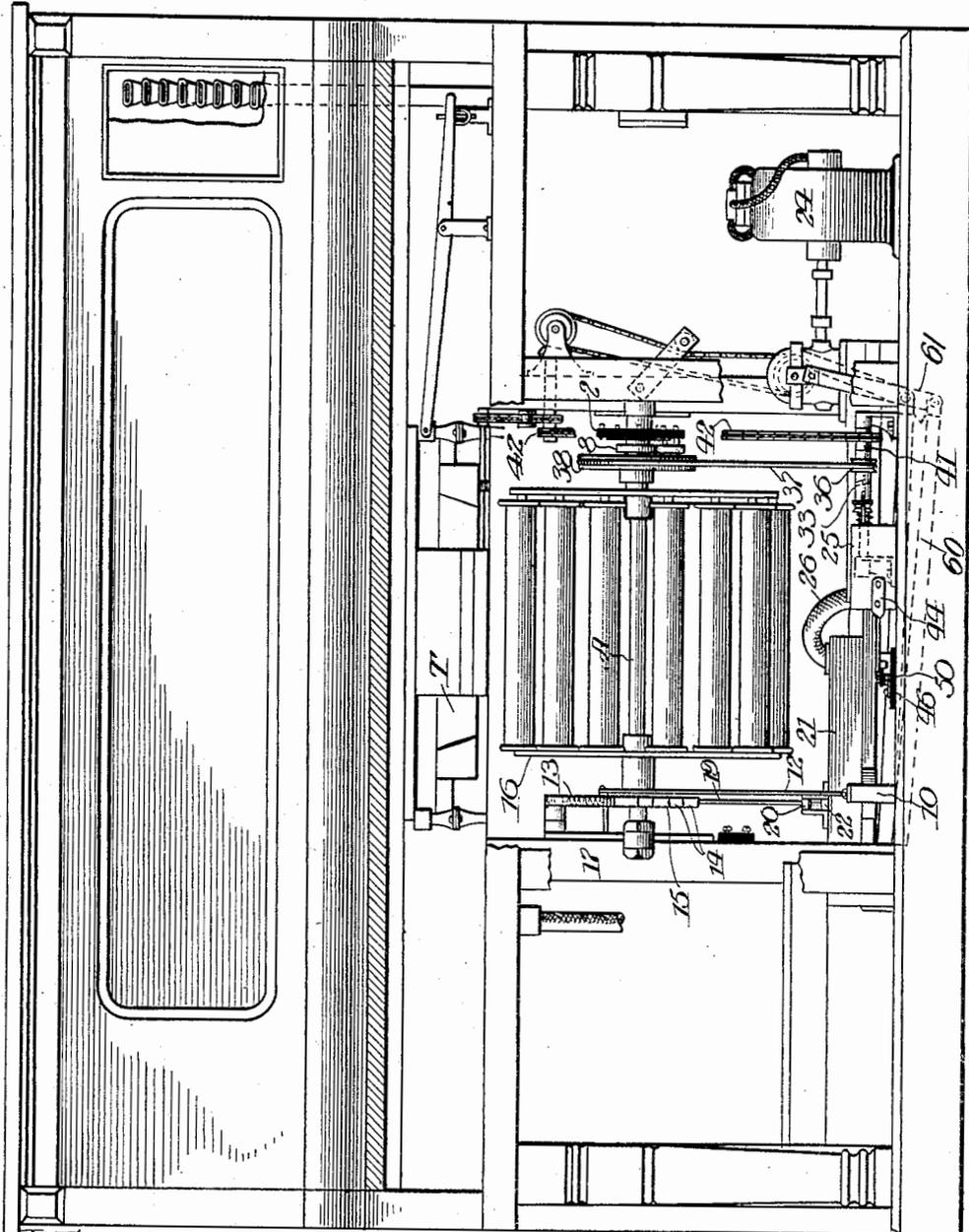


K. O. CARLSON.  
AUTOMATIC PIANO PLAYER HAVING SELF SETTING DEVICE.  
APPLICATION FILED AUG. 7, 1912.

1,068,217.

Patented July 22, 1913.

2 SHEETS—SHEET 1.



Witnesses  
O. M. Hennrich  
E. Lundy.

Fig. 1.

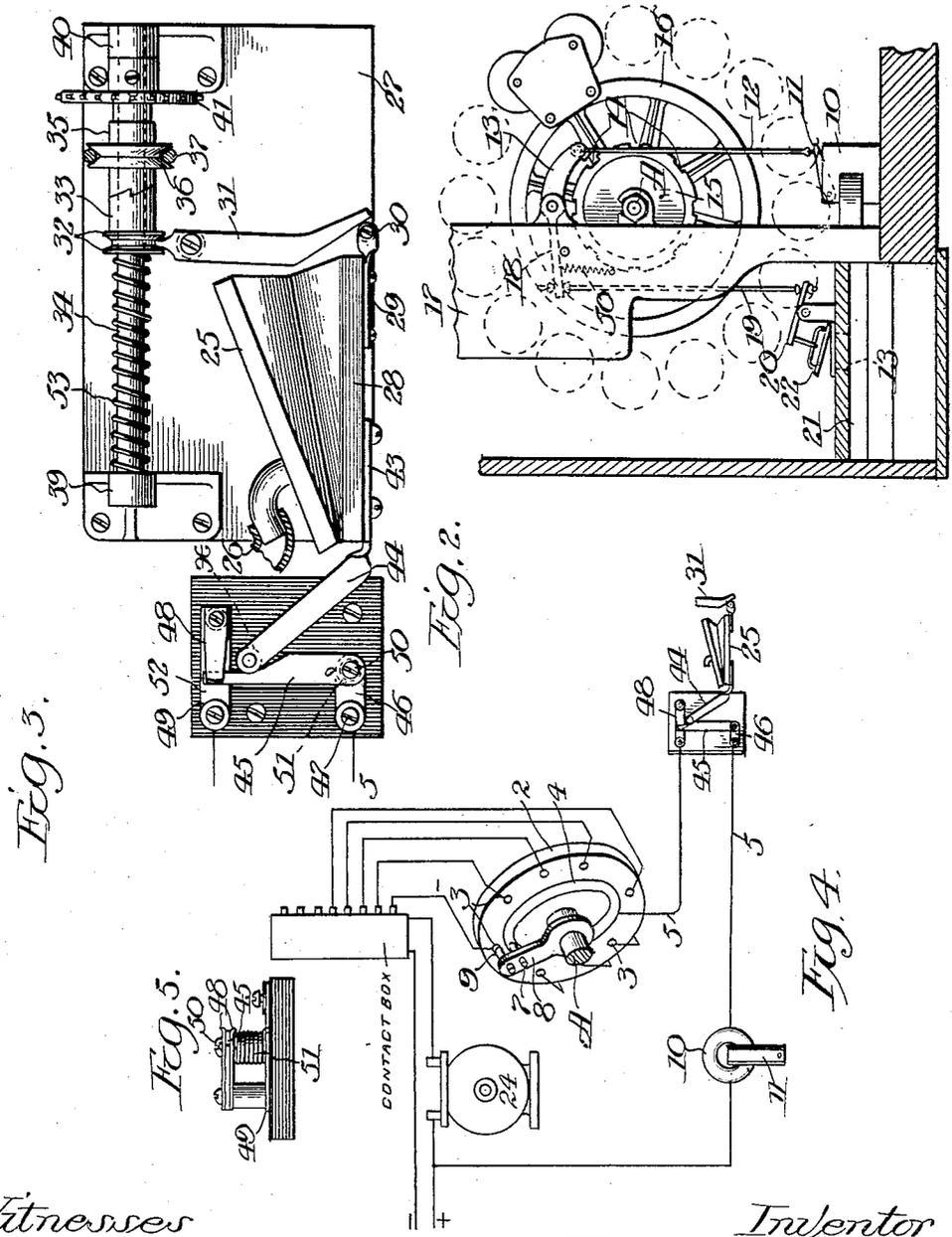
Inventor  
Karl O. Carlson  
by Frank D. Thomason  
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Witnesses  
 Orr. Mennick  
 E. Lundy.

Inventor  
 Karl O. Carlson  
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# UNITED STATES PATENT OFFICE.

KARL O. CARLSON, OF CHICAGO, ILLINOIS, ASSIGNOR TO NATIONAL PIANO MANUFACTURING COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

AUTOMATIC PIANO-PLAYER HAVING SELF-SETTING DEVICE.

1,068,217.

Specification of Letters Patent.

Patented July 22, 1913.

Application filed August 7, 1912. Serial No. 713,752.

*To all whom it may concern:*

Be it known that I, KARL O. CARLSON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Automatic Piano-Players Having Self-Setting Devices, of which the following is a full, clear, and exact description.

My invention relates to improvements in automatic player pianos.

The object of my invention is to automatically and promptly disconnect the actuating mechanism from the rotating perforated music roll magazine, when the selecting mechanism of the piano has moved the same so that the music roll to be played is brought into position to be engaged by the tracker-board, and to break the selective circuit. This I accomplish by comparatively simple devices the operation of which is less complicated and more direct, and at a great reduction of cost, substantially as hereinafter fully described, and as particularly pointed out in the claims.

In the drawings: Figure 1 is a front view of a player piano to which my improvements are applied, showing the lower part of the case broken away and the action and some other parts removed so as to expose to view and illustrate the application of my improvements. Fig. 2 is a fragmentary view showing the lower part of the case in section, and a side elevation of the rotating magazine and coacting mechanism relating to my improvements. Fig. 3 is a detail view showing a plan view of a pneumatic and clutch and electric switch actuated thereby. Fig. 4 is a diagrammatical view illustrating the electrical features of the selective mechanism. Fig. 5 is an edge view of the switch shown in Fig. 3.

The piano player to which my improvements are more particularly intended to be applied is operated automatically by dropping a coin in any one of the series of slots. The mechanism of the piano includes a revolving carrier or magazine that carries a number of rolls of perforated sheet music and when the operator desires to hear any particular piece of music he deposits the coin in the particular slot designated by the title of the same. The first result from this action is to start the motor that sets the pumps in motion, and revolves the maga-

zine, the second result is to automatically stop the magazine from revolving when it reaches the position where the perforated music it is desired to play can be engaged by the tracker-board T, and the third result is to automatically disengage the actuating mechanism from said magazine, and open the electric circuit utilized by the selective mechanism of the player and fourth, bring the tracker-board and perforated sheet music together.

Now, the mechanism for selecting the rolls of perforated sheet music in an automatic piano player to which my improvements are applied is the same as that embodied in the applications for Letters Patent of the United States, filed by Kingsley and Carlson, March 3, 1909, Serial Number 481,068, and May 4, 1910, Serial Number 559,403, and shown diagrammatically in Fig. 4 of the drawings. Briefly speaking, this selective mechanism comprised a stationary disk of insulating material, 2, through which the shaft A of the magazine-carrier (which will hereinafter be more fully described) extended. This disk has a series of equidistant contacts passing transversely through it and each of these contacts is connected by a wire to mechanism that causes the circuit through said wire to become energized when a coin is deposited and engaged the same,—which mechanism is not shown. This disk has a concentric metallic annulus 4 embedded in one side thereof which was connected by the wire 5 of said circuit to a contact, and this annulus was constantly engaged by a metallic brush 7 tapped through an arm 8 securely mounted upon and revolving with shaft A. Arm 8 extended beyond brush 7 and was provided with a substantially corresponding brush 9 which was tapped there-through, the extremity of which latter adjacent the disk 2, as said arm revolves successively engages the contacts 3, 3. When brush 9 engages the contact, 3, that is electrically connected in circuit 5, to the particular mechanism actuated by said coin the circuit is complete, and a magnet, 10, connected in said circuit is energized and attracts an armature, 11, which latter is connected by a rod 12 to a pawl 13 that is adapted to enter a recess 14 in the periphery of a plate 15 securely mounted upon shaft A and stop the further revolution of said shaft.

When pawl 13 engages a recess 14 in plate 15, it is necessary to simultaneously disconnect the actuating mechanism for rotating the perforated sheet music magazine 16. This is accomplished principally through the instrumentality of the main bellows 60 of the piano that is operated by a pitman 61 deriving motion from the main shaft of the apparatus. Pawl 13 is journaled in suitable bearings in a bracket supported by the adjacent standard 17, and has an arm 18 extending rearwardly from its pivotal boss that is connected by a vertically disposed connecting-rod 19 to the forward branch of a rocking-beam 20, which latter is fulcrumed at its center of length to upright members arising from the top of a stationary air-chest 21. The end of this beam 20 opposite that engaged by rod 19 is suitably connected to a valve 22, the office of which is to open and close an opening 23 in the top of said chest 21.

Now, it will be borne in mind that the moment the coin is deposited in the piano, the motor 24 which actuates the mechanism for revolving the carrier also operates the pump for exhausting the air from the tracker-board T. Said parts operate and are arranged in substantially the same manner as the parts corresponding thereto and shown and described in the aforesaid applications for Letters Patents, to which reference is hereby made. The chest 21 is mounted on the upper stationary leaf of the stationary top of the pump, and the tracker-board pneumatically communicates with this chest 21 through the medium of tubes and shafts, which it is unnecessary herein to describe. Now, when valve 22 is open, the outer atmosphere is drawn into chest 21 through the opening controlled by said valve, and consequently, the air will not be exhausted from the tracker-board; but the moment that the pawl 13 engages the plate 15, valve 22 closes, and the pump will exhaust the air from chest 21, and from a small bellows 25 through the medium of a tube 26. This bellows 25 has one of its plates or leaves secured edgewise to a platform 27 located near the bottom of the piano casing, and the other leaf of said bellows has one end hinged to the stationary leaf thereof. This movable leaf 28 has a plate 29 secured longitudinally thereto, one end of which projects out beyond the edge opposite the hinge of the bellows and its projecting end or an anti-friction wheel 30 supported thereby engages the adjacent oblique edge of the longer arm of a lever 31. The extremity of the shorter arm of this lever, opposite its oblique end, is reduced almost to a point, and this pointed extremity enters the channel between two circumferential flanges 32, made integral with the movable member 33 of a clutch, which latter is splined to a shaft 34

to permit its moving longitudinally on said shaft, but insures its revolving therewith. The end edge of this member 33, opposite the flanges 32, is provided with serrations that are adapted to engage corresponding serrations in the adjacent edge of a sleeve 35, which latter is loose on shaft 34 and is provided with a grooved wheel 36 which is connected, by means of a belt 37, to the grooved wheel 38 fast on the shaft A, upon which the perforated music roll magazine is mounted and secured. Shaft 34 is journaled in suitable bearings 39 and 40 that are securely mounted on a platform 27, and it is driven through the medium of a sprocket-wheel 41, and a suitable chain 42, that connects it to the train of gearing that revolves continuously during the operation of the motor 24.

Secured longitudinally to the movable leaf 28 of bellows 25, is a plate 43 which has a continuation or arm 44 extending beyond the hinged edge of said leaf. This arm extends obliquely to the rear a suitable distance and has its farthest extremity provided with a roller  $\alpha$  that engages the beveled edge of a switch blade 45 the opposite end of which latter is pivotally mounted on a stud 50. This stud is connected by a plate 46 to a binding-post 47 to which one branch of the wire 5 of the selective circuit is attached. The free end of blade 45 is adapted to be normally held in engagement with a double spring contact 48 by means of a spring 51, coiled around stud 50, one end of which is held stationary while the opposite end is secured to said blade. Contact 48 is connected by a plate 52 to a binding-post 49, to which one end of the other branch of the wire 5 of the selector circuit is attached, and connects said contact to the annulus 4 of the stationary disk 2.

From the foregoing, it will be readily understood that the moment pawl 13 engages the circular plate 15 to stop the magazine from revolving, the valve 22 will close air-chest 31 to the outer atmosphere, and the pump of the piano, which sucks the air from chest 21, will cause bellows 25 to collapse and simultaneously separate the clutch member 33 from sleeve 35, and thereby disconnect the actuating gear from the magazine. The collapse of said bellows 25 will simultaneously move blade 45 of the switch out of engagement with the spring 48 of the contact 49 and open the selective circuit.

The means for automatically shutting off the current from the motor, when the perforated roll of music engaged by the tracker-board has been played, thereby causing the separation of said tracker-board from said music, and permitting the automatic release of pawl 13 by means of spring 50, to stop the operation of the pump, has been fully described in the aforesaid applications of

Kingsley and Carlson for Letters Patent, and does not need to be further elucidated herein. When these several final operations occur, and valve 22 has been automatically opened, the bellows 25 will expand and draw in air from chest 21, assuming the position shown in Fig. 3 and permitting a coil spring 53, surrounding shaft 34 adjacent the clutch member 33 to force the latter into engagement with the opposite clutch member 35. When the clutch member 33 is disengaged from the sleeve 35 its movement is opposed by this coil spring 53, which latter is compressed and held in its compressed position by the collapse of the bellows 25 and lever 31.

What I claim as new is:

1. An automatic piano comprising a pump, a bellows collapsed by said pump during the operation of the piano, a plurality of music sheets, a rotatable carrier therefor, and means for automatically revolving said carrier which means is disconnected from said carrier by the collapsing of said bellows.
2. An automatic piano comprising a pump, a bellows collapsed by said pump during the operation of the piano, a plurality of perforated music sheets, rolls upon which said sheets are wound, a rotatable carrier for the same, and means for automatically revolving said carrier which means disconnect and cease to revolve said carrier by the collapsing of said bellows.
3. An automatic piano comprising a pump, a bellows pneumatically connected to said pump, a plurality of perforated music sheets, rolls upon which said sheets are wound, a rotatable carrier for the same, a selective device that is adapted to stop the rotation of said carrier at predetermined points, and means actuated by said device that cause said pump to collapse said bellows which latter disconnects the actuating mechanism of said carrier.
4. An automatic piano comprising a pump, a bellows pneumatically connected to said pump which bellows remains collapsed during the operation of the piano, a rotatable carrier for music sheets, and gearing for revolving said carrier including a clutch which latter is disengaged from said carrier by the collapsing of said bellows.
5. An automatic piano comprising a pump, a bellows pneumatically connected to said pump which bellows remains collapsed during the operation of the piano, a rotatable carrier for music sheets, and gearing for revolving said carrier including an automatically returnable clutch member

which latter is disconnected by the collapsing of said bellows.

6. An automatic piano comprising a pump, a bellows pneumatically connected to said pump which bellows remains collapsed during the operation of the piano, an arm projecting from the hinged leaf of said bellows, a rotatable carrier for music sheets, and gearing for revolving said carrier including an automatically returnable clutch member which latter is engaged by said arm and is disconnected by the collapsing of said bellows.

7. An automatic piano comprising a pump, a bellows pneumatically connected to said pump, a plurality of perforated music sheets, rolls upon which said sheets are wound, a rotatable carrier for the same, a selective device, including an electric circuit, which device is adapted to stop the rotation of said carrier at predetermined points, and means actuated by said device which means cause said pump to collapse said bellows which latter opens said circuit.

8. An automatic piano comprising a pump, a bellows pneumatically connected to said pump, a plurality of perforated music sheets, rolls upon which said sheets are wound, a rotatable carrier for the same, a selective device, including an electric circuit, which device is adapted to stop the rotation of said carrier at predetermined points, a switch and means for opening and closing the same, and means actuated by said device which means cause said pump to collapse said bellows and through the latter operate said means and open said circuit.

9. An automatic piano comprising a pump, a bellows pneumatically connected to said pump, an arm projecting therefrom, a plurality of perforated music-sheets, rolls upon which said sheets are wound, a rotatable carrier for the same, a selective device, including an electric circuit, which device is adapted to stop the rotation of said carrier at predetermined points, a switch forming part of said circuit consisting of a spring contact and movable member, and means actuated by said device which means cause said pump to collapse said bellows which latter through the medium of said arm actuates the movable member of said switch and opens said circuit.

In witness whereof I have hereunto set my hand this 18th day of June, 1912.

KARL O. CARLSON.

Witnesses:

E. X. LUNDY,  
E. B. SHERMAN.