

No. 780,079.

PATENTED JAN. 17, 1905.

W. W. WATERMAN.
SELF PLAYING PIANO ATTACHMENT.

APPLICATION FILED NOV. 7, 1903.

Fig. 1.

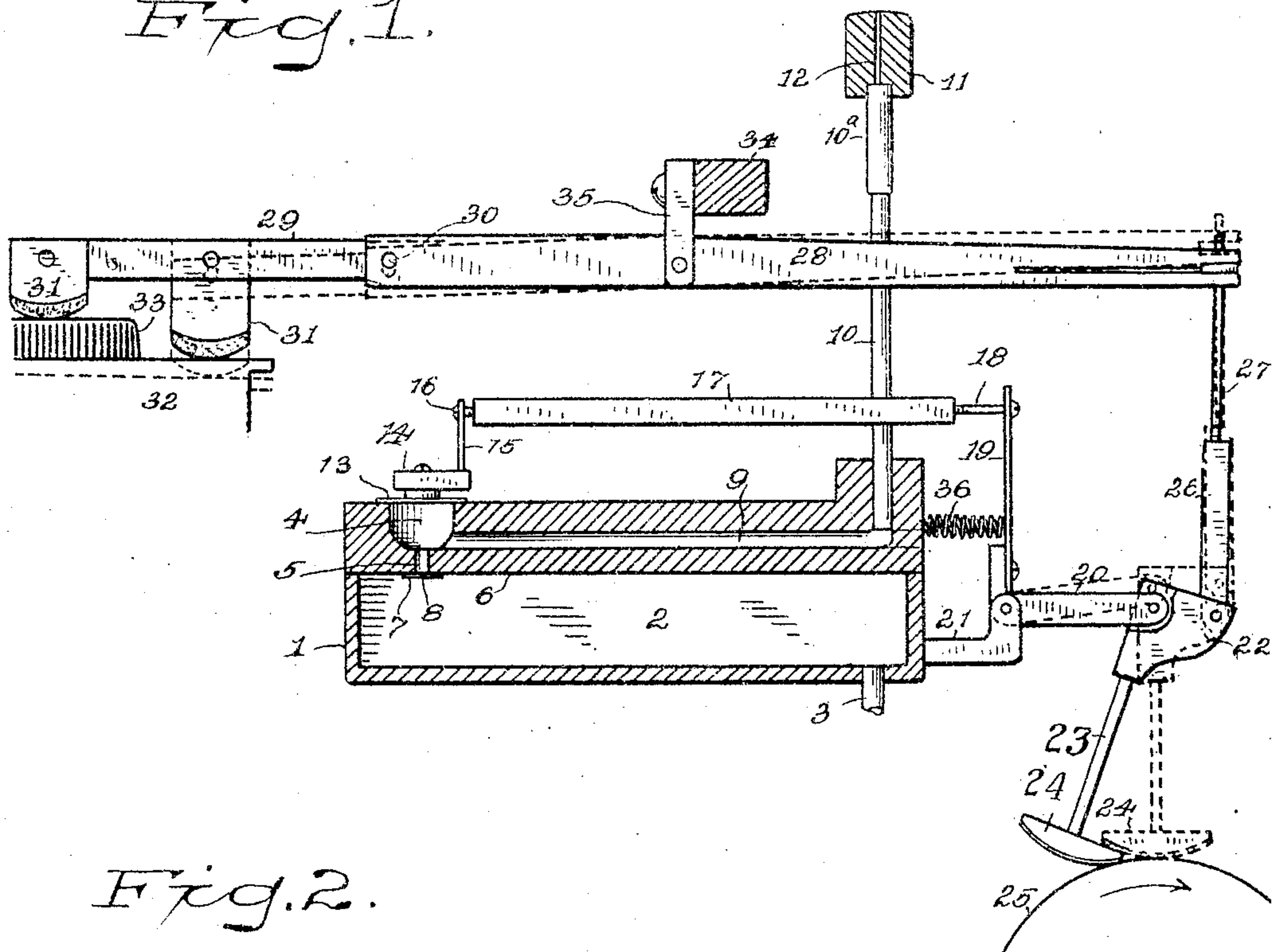


Fig. 2.

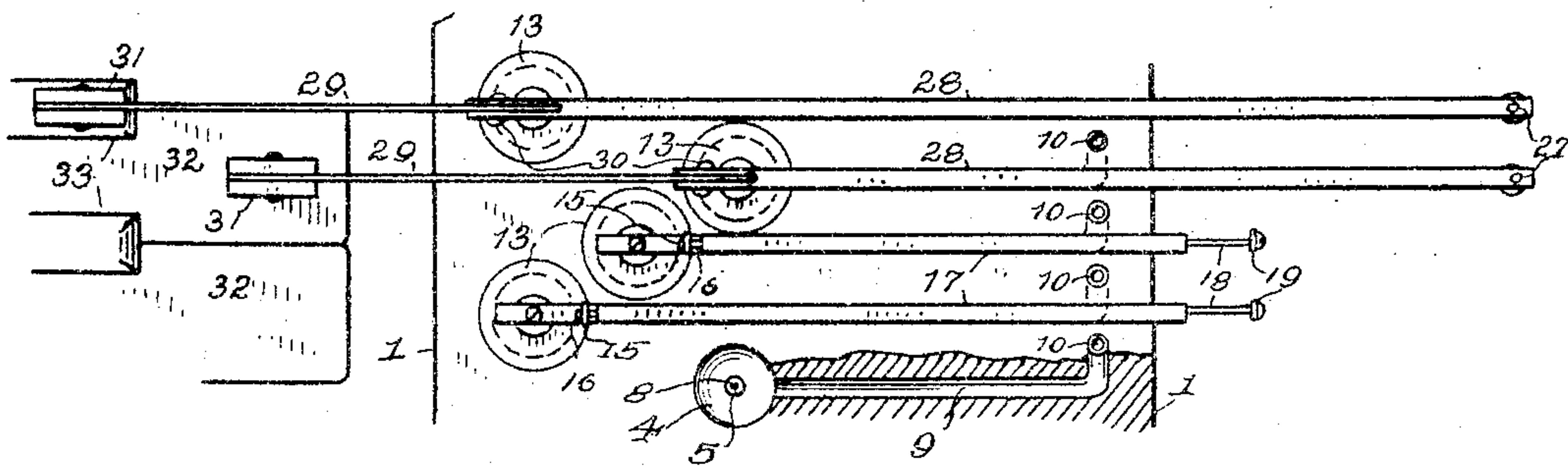
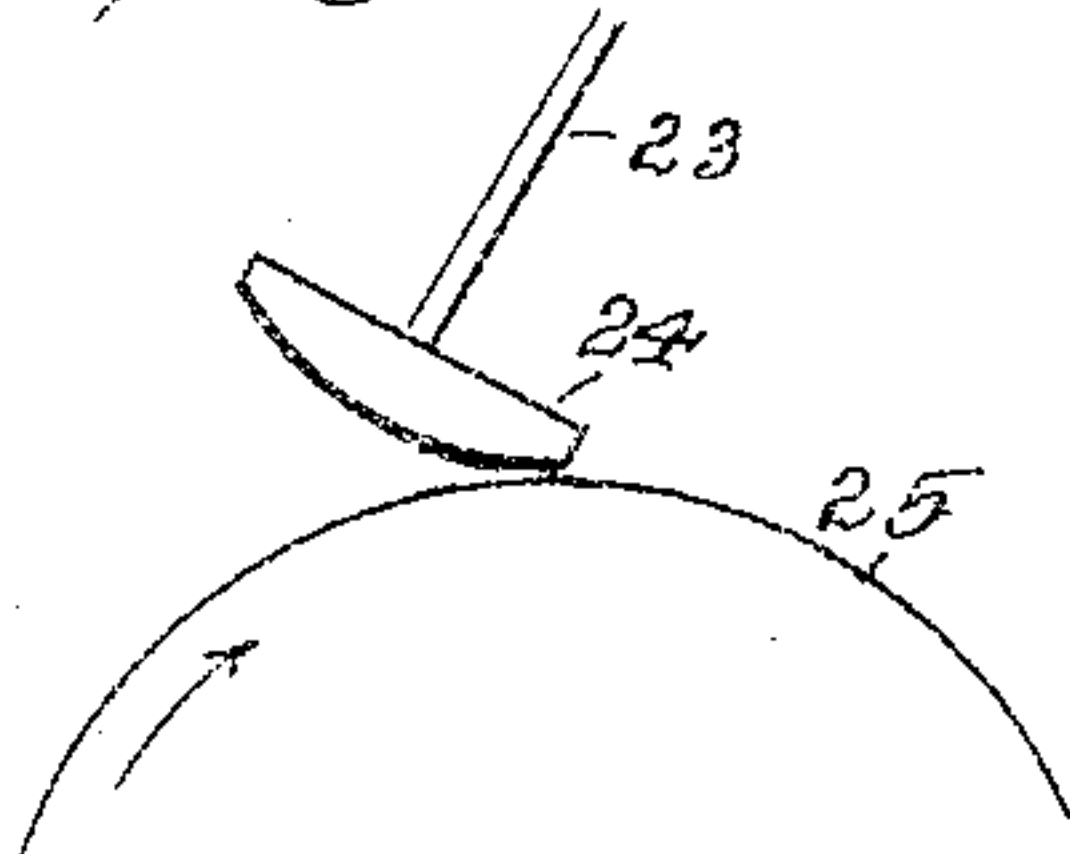


Fig. 3.

WITNESSES:

H. A. Lamb.
B. J. Chaffee.



INVENTOR

William W. Waterman.

BY Geo. D. Phillips.

his ATTORNEY

UNITED STATES PATENT OFFICE.

WILLIAM W. WATERMAN, OF BRIDGEPORT, CONNECTICUT.

SELF-PLAYING PIANO ATTACHMENT.

SPECIFICATION forming part of Letters Patent No. 780,079, dated January 17, 1905.

Application filed November 7, 1903. Serial No. 180,223.

To all whom it may concern:

Be it known that I, WILLIAM W. WATERMAN, a citizen of the United States, and a resident of Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Self-Playing Piano Attachments, of which the following is a specification.

My invention relates to self-playing attachments for pianos; and it consists in certain details of construction, to be more fully set forth in the following specification.

To enable others to understand my invention, reference is had to the accompanying drawings, in which—

Figure 1 is a side elevation of one of the finger-bars carrying finger-pads, broken view of two of the piano-keys, sectional view of the tracker, support for the finger-bars, wind-chest, and broken view of the driving-cylinder. Fig. 2 is a broken upper plan view, partly in section, of the wind-chest and broken plan view of the piano-keys and plan view of two of the finger-bars, plan view of two of the diaphragm-bars, the driving-cylinder not shown. Fig. 3 is a broken detail view of the driving-cylinder and one of the shoes of the key-bars out of contact with the cylinder.

Its construction and operation are as follows:

1 represents the wind-chest, which is adapted to extend nearly the full length of the keyboard, or, in other words, a distance sufficient to embrace the width of the music-sheet of sixty-five notes.

2 is the air-chamber; 3, broken view of the pipe or air connection leading from the air-chamber to the air-suction pump below, but not shown.

4 represents a series of vacuum pockets or chambers, one for each note.

5 is a hole extending through the partition 6 and leading into the chamber 2. 7 is a thin cover overlying this hole, having the small pin-hole 8 therethrough to form an air connection between the chamber 2 and the pockets 4.

A channel leads from each vacuum-pocket transversely through the wind-chest above the

chamber 2. 9 is one of these channels. (Shown at Figs. 1 and 2.)

10 is one of a series of vertical air-pipes whose lower ends open into said channels and whose upper ends are connected to the rubber tubes 10^a, and these rubber tubes are connected directly with the tracker 11. This tracker has a series of small holes, one, 12, being shown, which lead into these vertical pipes.

Overlying each of the vacuum-pockets are the flexible diaphragms 13, and connected thereto are the short bars 14. 15 represents short vertical rods projecting from these bars, which are loosely attached to the pins 16 in one end of the connecting-rods 17. 18 represents pins in the opposite ends of these rods, which are loosely attached to the vertical rods 19, which rods are connected to one arm of a series of bell-crank levers. One only, 20, is shown at Fig. 1. These levers are pivotally connected to the fixed support 21. The other arm of these bell-crank levers is pivoted to the connection 22. 23 is a rod attached to this connection, and it carries at its lower end the shoe 24, adapted to engage with the driving-cylinder 25, presently to be more fully explained.

26 is one of a series of vertical bars pivoted to the connections 22, and 27 represents a series of wires which connect these bars with each of the finger-bars 28. 29 represents reduced portions of these bars and for convenience in closing or folding them up may be secured to the heavier portion of the bars by the rivets 30.

31 represents the finger-pads, adapted to engage the piano-keys 32 and 33. The finger-bars are pivotally supported to the stationary cross-piece 34 by means of the vertical bars 35.

The pipes 10 are so connected with the wind-chest that they will all stand vertical and will not have to be bent to line with the tracker.

36 is a spring adapted to be placed between each of the vertical rods 19 and the wind-chest to exert a constant pressure against said rods for the purpose presently to be explained.

Operation: The driving-cylinder 25 is running continuously while the piano is being

played. When, therefore, the hole 12 of the tracker is closed by an unperforated portion of the music-sheet, the exhaust-pump or bellows operated by the feet will exhaust the air from the chamber 2, pockets 4, channels 9, and pipes 10. In other words, there will be a vacuum formed in the wind-chest and above the same. This vacuum will cause the flexible diaphragm to fall in or sink down into the pockets, and this downward movement of the diaphragms will lift the shoe 24 from the cylinder and also compress the spring 36. The instant a perforation in the music-sheet has uncovered the hole 12 of the tracker the air will rush down into the pocket 4; but owing to the very small pin-hole 8 the volume of air cannot flow into the chamber 2 fast enough to cause a loss of its force before the diaphragm 13 is lifted sufficient to permit the spring 36 to throw down the shoe 24 onto the continuously-running cylinder and carry said shoe from its position shown at Figs. 1 and 3 to the dotted position shown at Fig. 1. This will tilt the finger-bar connected with such shoe and depress its opposite end to sound a note.

The construction above described is very simple and cheap, as there are no valves to be operated and get out of order.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a self-playing attachment for pianos, the combination with a wind-chest, a tracker over which perforated sheet-music is fed, said tracker having air-passages leading therefrom, of pockets located at the end of said passages, each pocket of larger area in cross-section than the air-passage opening therein, a flexible diaphragm overlying each of said pockets, key-actuating mechanism connected with said diaphragms, air-passages of smaller area in cross-section than said tracker air-

passages and leading from said pockets to said wind-chest, for the purpose set forth.

2. In a self-playing attachment for pianos, the combination with a wind-chest and a tracker over which perforated sheet-music is fed, said tracker having air-passages leading therefrom, of pockets located at the end of said passages, each pocket larger in cross-section than said air-passages opening therein and of smaller area at the bottom, a flexible diaphragm overlying said pockets, key-actuating mechanism connected with said diaphragms, air-passages of smaller area in cross-section than said tracker air-passages and leading from said pockets to said wind-chest, for the purpose set forth.

3. In a self-playing attachment for pianos, the combination with a wind-chest and a tracker over which perforated sheet-music is fed, said tracker having air-passages leading therefrom, of concave pockets located at the end of said passages and of larger area in cross-section than said air-passages, air-passages of smaller area in cross-section than said tracker air-passages and leading from the bottom of said pockets to said wind-chest, a flexible diaphragm overlying said pockets, key-actuating mechanism connected with said diaphragms comprising the horizontal connecting-rods 17, bell-cranks 14 and 15, bell-crank levers 19, connections 22 carrying at their lower ends shoes 24 adapted to engage the driving-cylinder 25, vertical bars 26 intermediate of the finger-bars 28 and said connections, for the purpose set forth.

Signed at Bridgeport, in the county of Fairfield and State of Connecticut, this 6th day of November, A. D. 1903.

WILLIAM W. WATERMAN.

Witnesses:

GEORGE W. FINN,
S. J. CHAFFEE.