

(No Model.)

T. L. LEBEAU.

SELF PLAYING ATTACHMENT FOR PIANOFORTES.

No. 519,157.

Patented May 1, 1894.

Fig: 1.

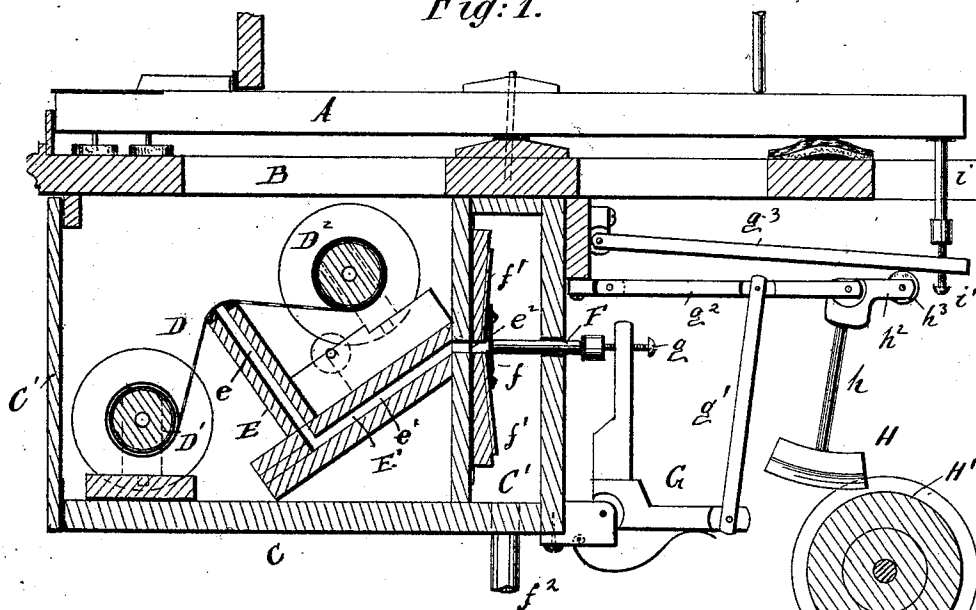
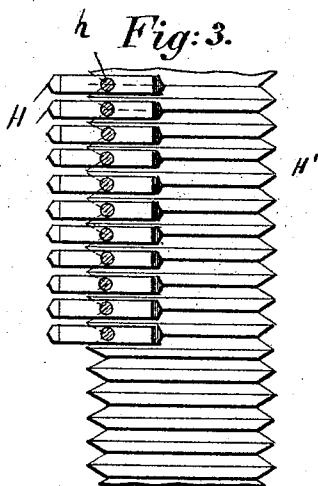
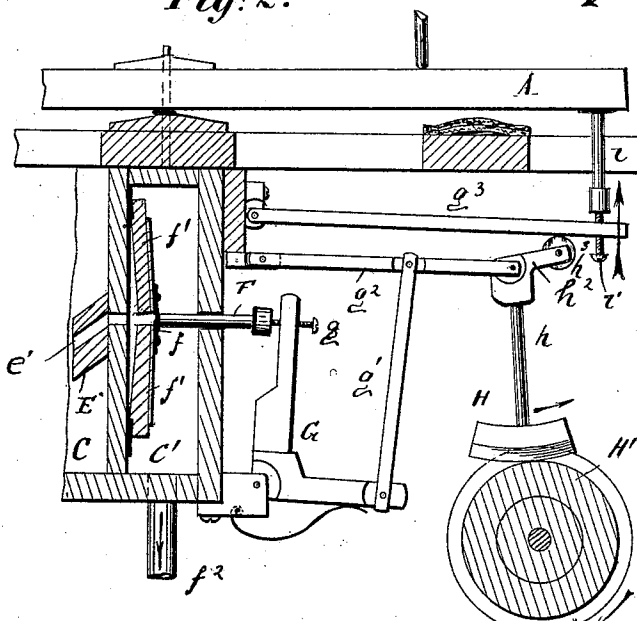


Fig: 2.



WITNESSES:

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SELF-PLAYING ATTACHMENT FOR PIANOFORTES.

SPECIFICATION forming part of Letters Patent No. 519,157, dated May 1, 1894.

Application filed August 23, 1893. Serial No. 483,849. (No model.)

To all whom it may concern:

Be it known that I, TELESPHAR L. LEBEAU, a citizen of the United States, residing in the city of New York, in the county and State of New York, have invented certain new and useful Improvements in Self-Playing Attachments for Pianofortes, of which the following is a specification.

This invention relates to that class of self-playing attachments for piano-fortes, in which a perforated music-sheet is operated by suitable power, operates by pneumatic action an intermediate lever mechanism, by which the key-levers of the piano are operated, and thereby the piano played in an automatic manner.

The invention consists of a self-playing attachment for piano-fortes, which is arranged below the key-bottom of the piano, and in which a continuously-moving music-sheet operates by intermediate pneumatic actions horizontally guided pushers, which actuate by means of intermediate levers a series of beveled push-pieces that engage a continuously rotating roller having a series of parallel grooves for said push-pieces, said push-pieces operating intermediate levers, and stickers that act on the key-levers of the piano so as to operate the piano action and produce thereby the playing of the piano.

The invention further consists in the construction and combination of parts and details, which will be fully described hereinafter and finally pointed out in the claims.

In the accompanying drawings, Figure 1 represents a vertical longitudinal section of my improved self-playing attachment for piano-fortes, showing the same arranged below the key-board of the piano. Fig. 2 is also a vertical longitudinal section, showing the same in the act of operating a key-lever operating one of the piano actions, and Fig. 3 is a detailed plan view of the grooved roller and the push-pieces actuated by the same.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, A A represent the key-levers of a piano-forte, which are fulcrumed in the usual manner and supported on a key-bottom B, below which the casing C is arranged, in which my improved self-play-

ing attachment for piano-fortes is contained, so that the same is entirely out of sight and fully protected against injury. The front of the casing C is provided with a hinged fall-board C', by which access is given to the interior of the casing, so as to interchange the perforated music-sheet D, which is wound on a roller D' and attached to a second roller D², which rollers are supported in bearings of standards arranged at the interior of the casing C. The roller D² acts as the winding up roller, while the roller D' acts as the unwinding roller when the music-sheet is moved to operate the self-playing attachment. The winding up roller D² is actuated by a belt and pulley or other suitable transmission from a foot-operated treadle, a spring-motor, electro-motor, or other suitable power, so as to receive a uniform rotary motion by which the perforated music-sheet D is moved over the rounded-off end of an inclined frame E, which is provided with as many channels *e* or ducts for the air as there are keys to be operated, said frame corresponding to the width of the music-sheet and the number of pneumatic actions. My self-playing attachment is not intended to actuate every key of the piano, but it takes in only those keys which are within a certain range, and which are necessary to play the average piece of music, the self-playing actions being arranged for about one half of the keys of the ordinary piano. The inclined frame E is arranged immediately between the unwinding roller D' and the winding up roller D², and communicates with the second supporting frame E' which is supported at the inside of the casing C. The ducts *e* in the frame E correspond with the ducts *e'* in the supporting-frame E', each duct *e'* terminating at and communicating with a duct *e*² that is arranged in the rear wall of the casing C. Each duct *e*² is closed by a leather diaphragm *f* which is attached to two levers *f'* that are hinged at their outer ends to the rear wall of the casing C. The diaphragm *f* and levers *f'* are arranged in a wind-chest C', which is arranged at the rear of the casing C, and which is connected by a tube *f*² with a suitable bellows, by which a suction is created in the wind-chest, said bellows being operated from the motor by which the self-play-

ing attachment is operated, so that a continual suction action is exerted on the interior of the wind-chest. In line with the duct e^2 passing through the rear wall of the casing C are guided horizontal pushers f which are in contact with the centers and which are guided in holes of the rear wall of the wind-chest C' . Against the head of each pusher F rests a set-screw g of an elbow lever G , which is fulcrumed to the outside of the wind-chest C' and which is connected at its lower arm by an intermediate pivot-strap g' with a lever g^2 pivoted to a rail attached to the upper part of the wind-chest. To the outer end of the lever g^2 is pivoted a shank h of a push-piece H , which is made of arc shape and provided with a V-shaped edge, said V-shaped edge taking into a corresponding groove arranged on the circumference of a roller H' to which continuous rotary motion is imparted by suitable transmission from the motive power from which motion is transmitted to the self-playing attachment. The roller H' is provided with as many V-shaped grooves as there are push-pieces H , said roller being arranged in suitable supporting bearings not shown in the drawings. The shanks h of the push-pieces H are provided with a backwardly-extending arm h^2 which carries an anti-friction roller h^3 which engages the under side of a lever g^3 which is, like the lever g^2 , pivoted to the upper rear part of the wind-chest C' , said lever g^3 carrying on its outer end a sticker i which is connected by an adjusting screw i' with the lever g^3 . The stickers i act on the under sides of the key-levers A whenever they are lifted by the combined intermediate pneumatic and lever mechanisms. The key-levers, whenever actuated by the stickers, operate the piano-action in the usual manner and produce thereby the sounding of the strings.

My improved self-playing attachment for piano-fortes operates as follows:—The roller on which the self-playing music-sheet is wound is placed in position in the supporting bearings of the same in the front part of the casing C , and the music-sheet is moved over the rounded off edge of the frame E to the winding up roller D^2 . The motor, whether it be of foot, electric or other power, is then started and thereby the winding up roller slowly rotated while simultaneously the grooved roller H' is likewise rotated on its axis in the direction of the arrows shown in Figs. 1 and 2. When the unperforated portions of the music-sheet D pass over the ducts e of the duct-frame E , no air can pass to the diaphragms f , so that the pushers F and the levers connected with the same are not operated, as soon as, however, one of the perforations of the music-sheet passes over the air-duct e , the atmospheric pressure exerted on one side of the diaphragms, in connection with the suction action exerted on the opposite sides of the same, produces the backward motion of the diaphragms as far as permitted

by the hinged levers to which the same are applied, so that the pushers F are moved in backward direction, whereby the fulcrumed lever G is operated and the push-piece H moved in downward direction, so as to be engaged by the corresponding groove of the rotation roller H' . As the push-piece is engaged by the roller and moved in the direction of the arrow in Fig. 2, it is lifted by the contact with the roller, so that the anti-friction roller h^3 and its arm h^2 produces the lifting up of the key-lever and the sounding of the string. As soon as the opening in the music-sheet has passed over the duct e , the entrance of air to the diaphragm through the ducts e , e' , e^2 , is interrupted, and thereby the diaphragm f returns to its initial position, together with the pusher F and the levers operated by the same. By the return of the lever G , and the pivot-strap g' and the lever g^2 to the former position, the arc-shaped push-piece H is likewise returned to its normal position, which is readily accomplished, as the same is lifted by its lever g^2 above the groove of the roller H' , so that the push-piece is readily returned to its initial position, ready to be operated again when the next opening passes over the duct e of the frame E . By the pneumatically-operated connection with the lever mechanism, the quick and reliable action of the latter is produced as the pneumatic action responds quickly whenever the openings of the music-sheet pass over the rounded-off edge of the duct-frame E . The lever mechanisms operated by the pneumatic action, produce, in connection with the grooved roller H' , a reliable actuation of the push-pieces by the same and the reliable action of the key-levers and piano-action, and thereby the corresponding sounding of the strings.

As the entire self-playing attachment is arranged below the key-board of upright pianos, it is entirely out of the way and is protected against dust and injury. The entire attachment is comparatively inexpensive and it is easily operated, so as to produce any desired piece of music by simply changing the music-sheets, as the winding and unwinding rollers are arranged in the front parts of the casing, to which easy access is given by the opening of the front fall-board of the casing C .

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

1. The combination of a perforated music-sheet, means for continuously moving the same, a wind-chest, pneumatic actions in the wind-chest adapted to be operated through the medium of the music-sheet, intermediate lever-mechanisms operated by the pneumatic actions, depending push-pieces connected to said intermediate lever-mechanisms, a roller located below and adapted to raise the push-pieces moved into contact with the same, levers pivoted at the rear of the wind-chest, and arranged above and engaged by the up-

per ends of said push-pieces, and stickers arranged upon said levers and operated by the push-pieces for actuating the key-levers, substantially as set forth.

5 2. The combination, of a perforated music-sheet, means for moving the same, pneumatic actions controlled by means of the openings of said music-sheet, pushers operated by the pneumatic actions, fulcrumed elbow-levers
10 operated by said pushers, push-pieces having V-shaped edges and connected with said elbow-levers, a grooved rotary roller, adapted to receive the V-shaped edges in its grooves and stickers operated by the arms on the
15 shanks of the push-pieces, said stickers operating the key-levers so as to operate the piano action and sound the strings, substantially as set forth.

20 3. The combination, of a perforated music-sheet, means for moving the same, pneumatic

actions composed of a duct-frame, over which the music-sheet is passed, a wind-chest from which the air is exhausted, diaphragms applied to hinged levers located in said wind-chest, ducts extending from the duct-frame to 25 the diaphragms, pushers guided in the wind-chest and an intermediate lever mechanism connected with the key-levers and provided with adjustable stops engaged by the pushers so as to operate the key-levers whenever 30 the perforations of the music-sheet pass over the lug in the duct-frame, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses. 35

TELESPHAR L. LEBEAU.

Witnesses:

CHARLES SCHROEDER,
ADOLPH SCHERER.