

W. KIRKEGAARD.
PIANO PLAYING ATTACHMENT.
APPLICATION FILED NOV. 8, 1910.

1,011,967.

Patented Dec. 19, 1911

4 SHEETS—SHEET 1.

Fig. 1.

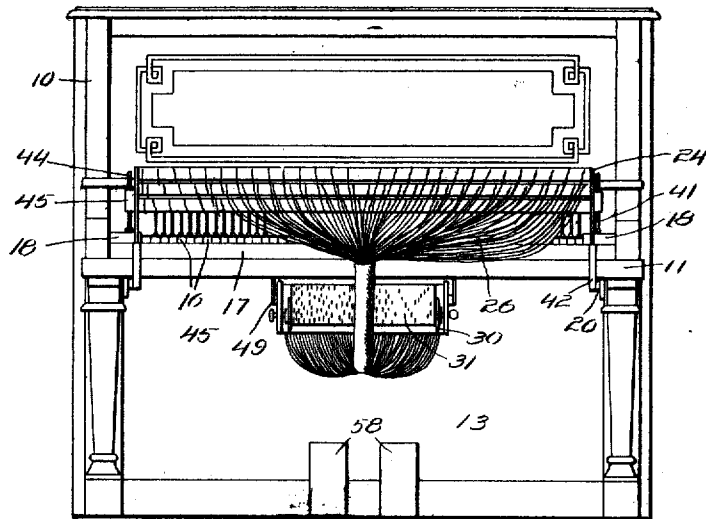
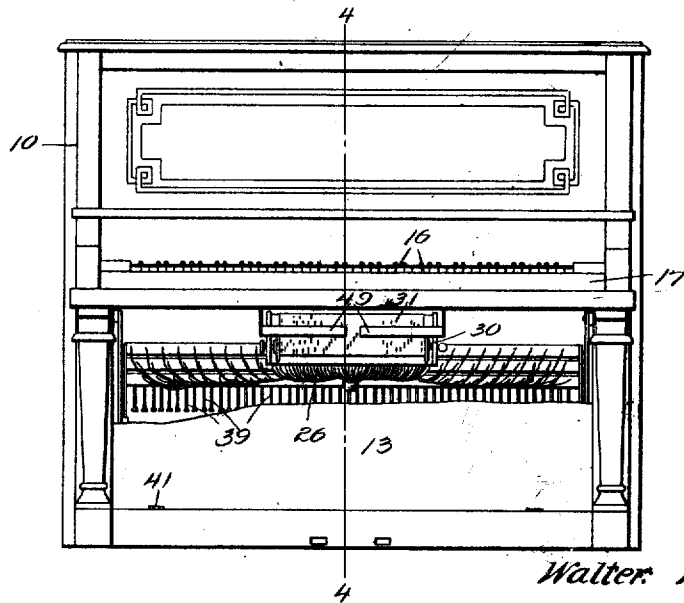


Fig. 2.



Inventor
Walter Kirkegaard.

Witnesses
F. L. Gibson.

H. O. Paulsen.

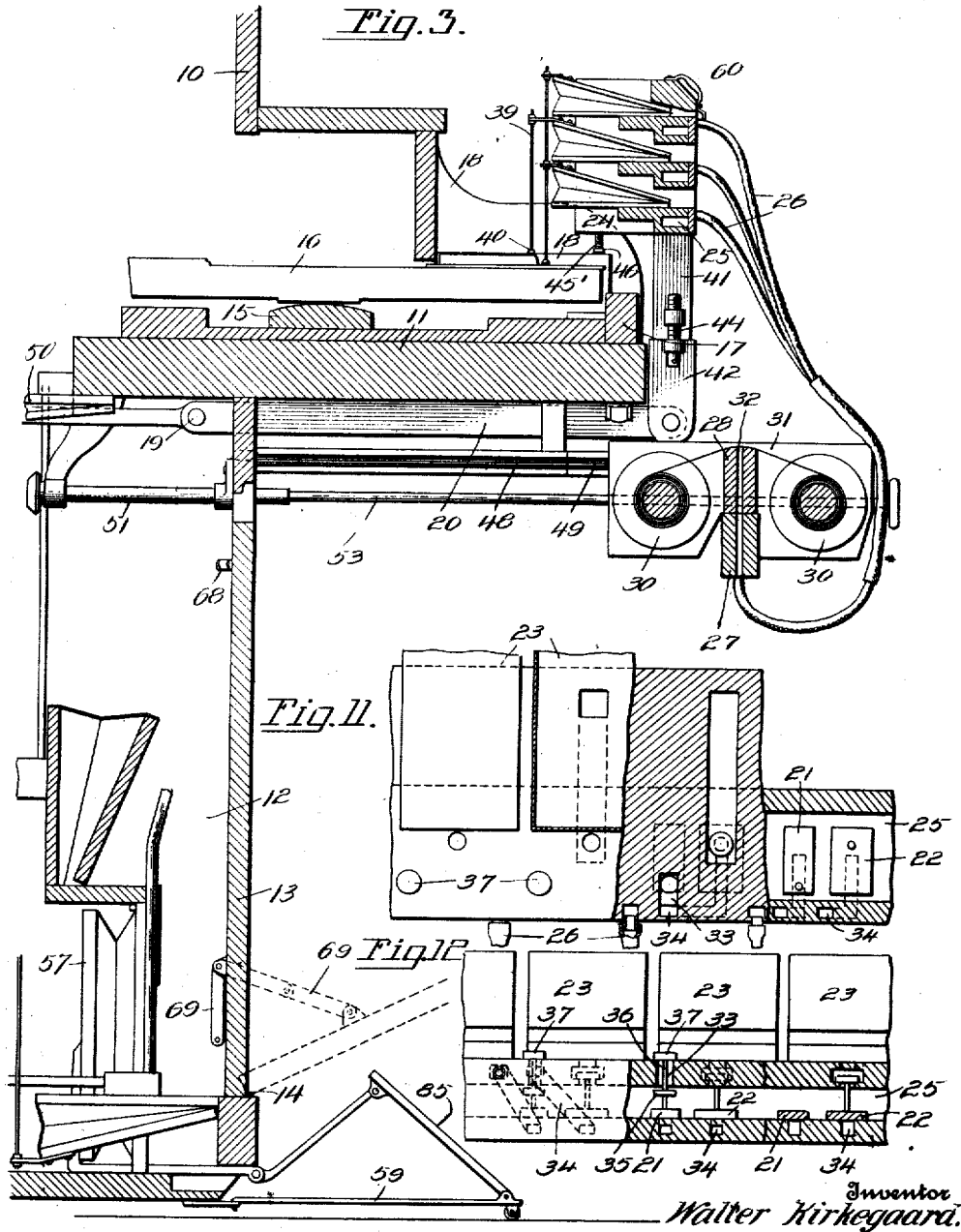
By Victor J. Evans
Attorney

W. KIRKEGAARD.
PIANO PLAYING ATTACHMENT.
APPLICATION FILED NOV. 8, 1910.

1,011,967.

Patented Dec. 19, 1911.

4 SHEETS—SHEET 2.



Witnesses

F. L. Gibson.

A. O. Parker.

Walter Kirkegaard.
Victor J. Evans

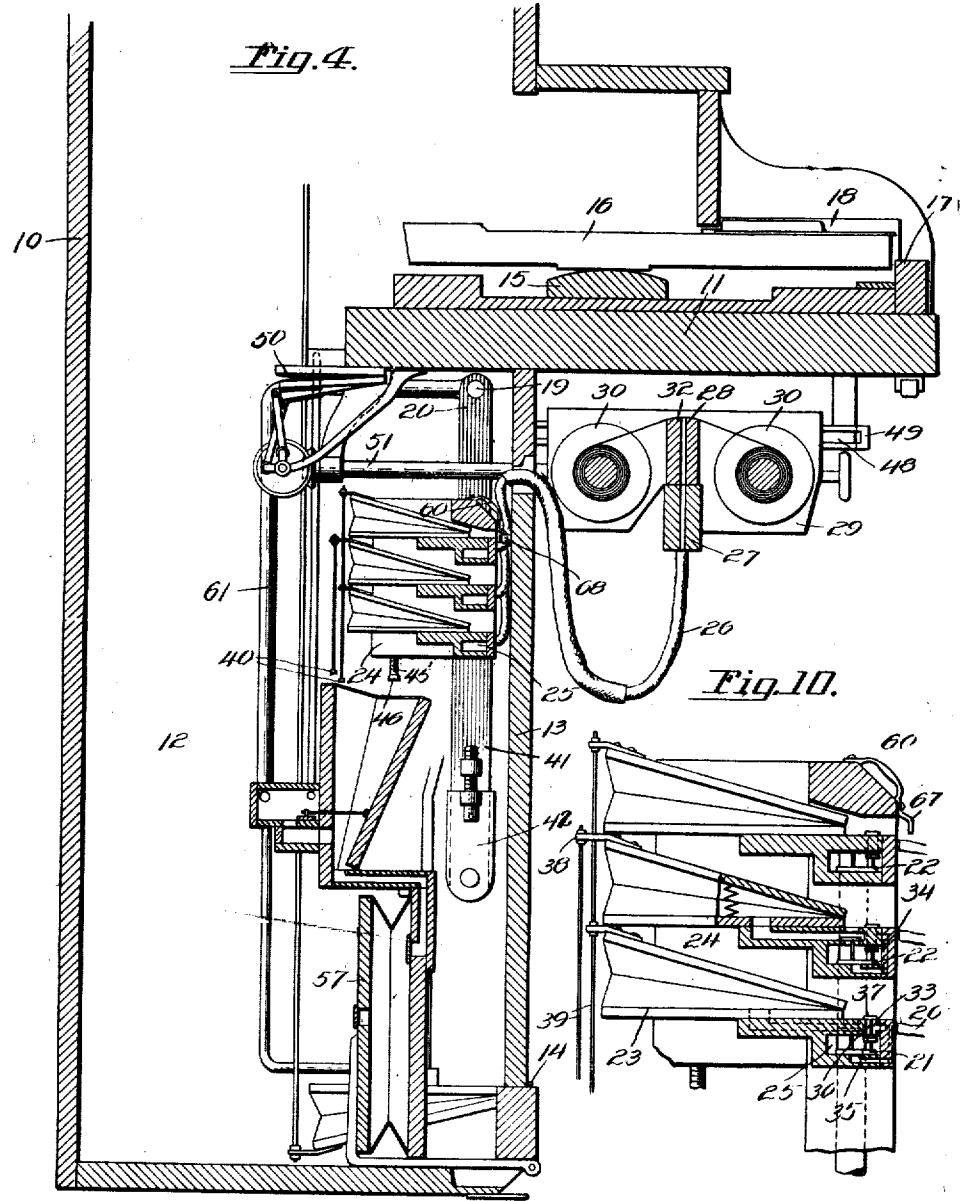
Attorney

W. KIRKEGAARD.
PIANO PLAYING ATTACHMENT.
APPLICATION FILED NOV. 8, 1910.

1,011,967.

Patented Dec. 19, 1911.

4 SHEETS—SHEET 3.



Inventor
Walter Kirkegaard.

Witnesses
F. L. Gibson.

J. O. Anderson.

By Victor J. Evans
Attorney

W. KIRKEGAARD.
PIANO PLAYING ATTACHMENT.
APPLICATION FILED NOV. 8, 1910.

1,011,967.

Patented Dec. 19, 1911.

4 SHEETS-SHEET 4.

Fig. 5.

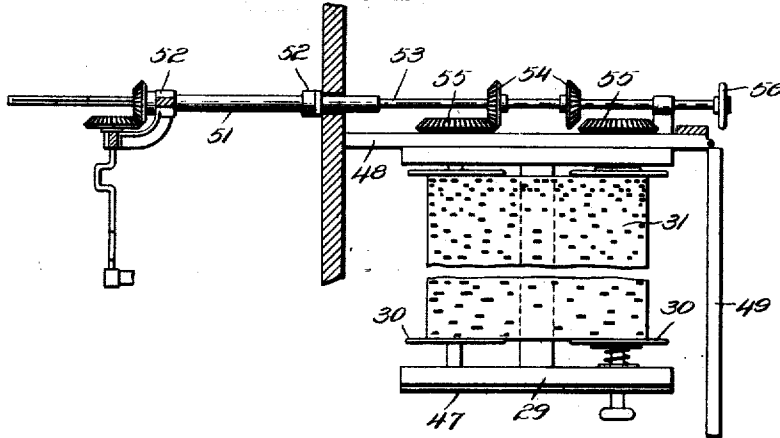


Fig. 6.

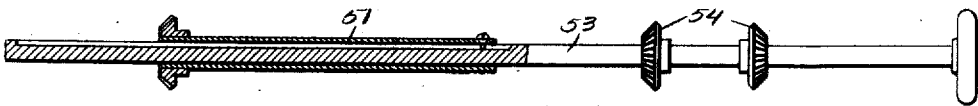


Fig. 7.

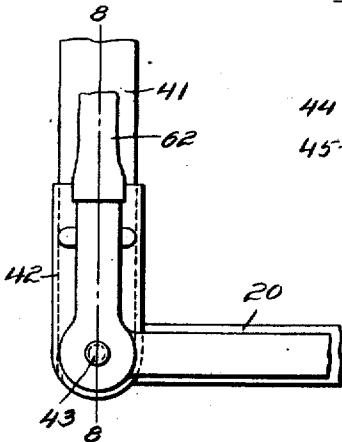


Fig. 8.

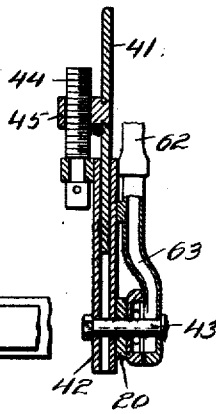
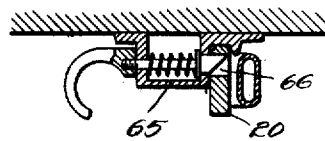


Fig. 9.



Witnesses

F. L. Gibson.

Y. O. Sanders.

Inventor
Walter Kirkegaard.

By *Victor J. Evans*
Attorney

UNITED STATES PATENT OFFICE.

WALTER KIRKEGAARD, OF DETROIT, MICHIGAN.

PIANO-PLAYING ATTACHMENT.

1,011,967.

Specification of Letters Patent.

Patented Dec. 19, 1911.

Application filed November 8, 1910. Serial No. 591,262.

To all whom it may concern:

Be it known that I, WALTER KIRKEGAARD, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented new and useful Improvements in Piano-Playing Attachments, of which the following is a specification.

The invention relates to a piano player, and more particularly to the class of foldable pneumatic playing attachments.

The primary object of the invention is the provision of an attachment of this character in which the same may be folded into the piano below the key bed when not in use, and readily and easily brought into position below said key bed when in use for the playing of the piano.

Another object of the invention is the provision of an attachment of this character in which the key operating mechanism may be readily and easily adjusted with respect to the keys on the key bed for the accurate and proper working of the keys for the pneumatic playing of the piano.

A further object of the invention is the provision of a piano playing attachment wherein the same, when not in use, may be conveniently folded and stored within the piano, thus making the attachment invisible, at which time the piano may be played by a performer in the ordinary well-known manner, the attachment being readily and quickly adjusted for use in the automatic playing of the piano.

A still further object of the invention is the provision of a piano attachment which is simple in construction, readily and conveniently folded when not in use and unfolded for use, and also that is inexpensive in manufacture.

In the drawings, accompanying and forming a part of this specification, is illustrated the preferred form of embodiment of the invention, which, to enable those skilled in the art to which the invention relates, to carry out the invention, will be set forth at length in the following description, while the novelty of the invention will be pointed out in the claims succeeding the description. However, it is to be understood that changes, variations, and modifications may be made such as come properly within the

scope of the appended claims, without departing from the spirit of the invention or sacrificing any of its advantages.

In the drawings: Figure 1 is a front elevation of a piano-forte with the attachment mounted thereon and in operative position. Fig. 2 is a similar view of the attachment in folded position and the front bottom board or door of the piano-forte partly broken away. Fig. 3 is a sectional view on the line 3—3 of Fig. 1. Fig. 4 is a sectional view on the line 4—4 of Fig. 2. Fig. 5 is a plan view of the tracker board frame and its adjunct parts. Fig. 6 is a fragmentary longitudinal sectional view through the telescoping driving shaft for operating the music sheet rolls or spools. Fig. 7 is a fragmentary side view of one of the supporting arms. Fig. 8 is a sectional view on the line 8—8 of Fig. 7. Fig. 9 is a vertical sectional view through one of the catch devices. Fig. 10 is an enlarged sectional view through the key operating mechanism. Fig. 11 is a fragmentary plan view of the pneumatic and the same being partly in sections. Fig. 12 is a front elevation of said pneumatic.

Similar reference characters indicate corresponding parts throughout the several views of the drawings.

With reference to the accompanying drawings by numerals, the piano is of any ordinary well-known or approved form, comprising a casing 10, its key bed being designated by 11, and underneath the key bed, the bottom of the piano is provided with a chamber 12 normally closed by a front board or door 13, the same being connected to the body of the piano by means of hinges 14, so that it may be swung to opened or closed position, whereby access may be had to the interior of the compartment or chamber 12, for a purpose as will be hereinafter more fully described.

Suitably secured to the key bed 11 of the piano is the usual balance rail 15, upon which are fulcrumed the keys 16 for the playing of the piano in the ordinary well-known manner, the front or forward ends of the keys being protected or shielded by means of a key slip 17 which is fixed to the key bed 11 between the ends 18 of the body of the piano, the keys 16 being operated by

means of a pneumatic piano playing attachment hereinafter more fully described.

Secured to and projecting inwardly from the sides or end walls of the piano casing 10 beneath the key bed 11 thereof and rearwardly with respect to the hinged front board or door 13 are trunnions or pivots 19, to which are connected the inner ends of swinging supporting arms 20 adapted to swing into the compartment or chamber 12 and outwardly therefrom parallel with the said key bed 11 below the same. Mounted for folding movement at the outer ends of the supporting arms 20 is a pneumatic key operating mechanism, comprising a series of primary, intermediate and power pneumatics 21, 22 and 23, respectively, the same being supported in a suitable frame, including end sections 24. The primary, intermediate and power pneumatics are all controlled from, and the first two named arranged within, the single exhaust chamber 25, and are provided with the usual valves. The intermediate pneumatic 22 is operated directly by the small primary pneumatic 21, and is arranged to control the valve of the power pneumatic in the ordinary well-known manner.

There are arranged above the keys 16 between the sections 24, three exhaust chambers 25, all disposed vertically with relation to each other, and each chamber has disposed therein a series of primary pneumatics 21 having the leading tubes 26 connected to the duct 27 of a tracker board 28, the latter fixed centrally within a sliding tracker board frame 29 which also carries at opposite sides of the tracker board 28, the usual winding and unwinding spools 30 supporting the usual note sheet 31, which latter passes over said tracker board and acts as a valve for said primary pneumatic,—i. e., so long as an imperforate portion of the note sheet covers the inlet 32 of the tracker board leading to said pneumatic, the latter remains inactive, but the moment a perforation in the note sheet passes over its inlet in the said tracker board, the pneumatic in the exhaust chamber 25 is instantly inflated. Arranged directly above the said pneumatic 21 is a valve chamber 33 which has a duct 34 running diagonally down and communicating with the interior of the pneumatic 22. Connected to and operated by the primary pneumatic 21 is a puppet valve 35 comprising a stem 36 and the disk 37, so that when said primary pneumatic opens, it raises said valve 35 and allows external air to enter under the said disk 37 into the valve chamber 33 and from thence through the duct or channel 34 into the intermediate pneumatic 22, which being located in the exhaust chamber 25 is immediately inflated, causing the lifting of the valve therein, thereby establishing communication through the duct be-

tween the exhaust chamber 25 and the power pneumatic 23 which instantly causes the latter to collapse or close.

Projecting outwardly from the free ends of the movable members of the power pneumatic 23 are extension rods 38 having their extreme ends connected to the downwardly projecting striker rods 39, the latter being provided with felted heads 40 adapted to stand directly over the keys 16 of the piano. Suitably fixed to the end sections 24 of the said pneumatic key operating mechanism are forearms 41, the same being slidably fitted in hollow elbows 42, which latter are connected by means of pivots 43 to the outer ends of said swinging arms 20, and these elbows 42 carry swiveled adjusting screws 44 working in threaded lugs 45 formed on the said forearms 41, the screws serving to permit the raising and lowering of the mechanism for positioning it properly above the key bed 11 of the piano.

Adjustably threaded in the end sections 24 of the key operating mechanism are supporting screws 45' provided with bearing blocks 46, which latter are connected in any suitable manner in the lower ends of the said screws 45', and are adapted to rest upon the key bed 11 at opposite ends of the piano. It is evident that by the adjustment of the screws 44 and 45', the striker rods 39 may be regulated for the proper positioning thereof relative to the keys 16 of the piano.

The tracker board frame 29 is provided with guide ribs 47 at opposite ends thereof, the same being slidably fitted in guide slots 48 suitably fixed in spaced parallel relation to each other medially beneath the key bed 11 of the piano, and are provided with outer hinged track extensions 49, whereby the frame 29 may be moved inwardly beneath the key bed 11 or pulled outwardly beyond the said key bed of the piano body, when the mechanism is operated.

Within the piano casing 10 at any suitable point near the center thereof, is arranged a pneumatic motor 50, the latter being adapted to operate a power driven shaft 51, the same being journaled in suitable bearings 52 within the piano casing, and telescoping within the shaft 51 is a slidable driven shaft 53, the same being suitably keyed in the said shaft 51 and upon this slidable shaft 53 are fixed cog gears 54 meshing with cog gears 55 connected with the ends of the spools 30, so that when the pneumatic motor is in action, motion will be imparted therefrom to the said spools 30 for the driving of the same, thereby causing the music note sheet 31 to traverse over the tracker board 28 in the ordinary well-known manner. The outer end of the slidable driven shaft 53 is provided with a hand knob or wheel 56, whereby the said shaft may be shifted for bringing the cog gears alter-

nately in engagement with and disengagement from the gears 55 of the spools 30 for the winding and unwinding of the music note sheets during the operation of the piano playing mechanism. The speed of the pneumatic motor 50 may be regulated in any desirable or well-known manner.

Within the chamber or compartment 12 in the piano-forte casing 10 is a main bellows 57, the latter being operated through the medium of suitable connections controlled by means of foot pedals 58, the latter being hinged to a detachable support 59, of the piano-forte, whereby the said pedals may be folded when not in use, the said pedals being adapted to exhaust the main bellows 57 in the usual well-known manner.

The main bellows 57 has connection with the pneumatic motor 50 in any suitable manner. Also the main bellows 57 is adapted to control and operate the pneumatics of the key operating mechanism, the said main bellows being in communication with the said pneumatics for this purpose in any ordinary well-known manner.

Suitably secured to the end sections 24 of the key operating mechanism are loop handles 60 which permit the ready folding and unfolding of the key operating mechanism into and out of the compartment or chamber 12 in the casing 10 of the piano, whereby the attachment may assume either of the positions as shown in Figs. 3 and 4 of the drawings. Communication between the main bellows 57 and the key operating mechanism is had preferably by means of air tubes 61 and 62 leading from the same, respectively, toward each other, the tubes being connected with hinged couplings 63 pivotally supported upon the pivot pins 43 carried by the elbows 42. Secured to the bottom of the key bed 11 are spring held latches 65, the same being adapted to engage in openings 66 formed in the supporting arms 20, so that when the latches 65 are engaged with the openings in the swinging arms and when the same have been swung outwardly in parallel relation to the key bed, the attachment will be sustained in operative position, whereby the key operating mechanism will be superposed above the keys of the piano for the operation thereof. The forward ends of the loop handles 60 are provided with hook catches 67, which latter are adapted to be engaged by spring fingers 68 fixed to and projecting inwardly from the front board or door 13, so that when the attachment is folded within the chamber or compartment 12 in the piano casing 10 and on the closing of the door 13, the fingers 68 will engage with the hook catches 67, thus locking and holding the door 13 in closed position, and thereby concealing the attachment within the piano casing. Connected with the door or front board 13 are hinged

brackets 69, the same also being connected to the side or end walls of the piano casing 10 and are adapted to hold the said door or board 13 against swinging outwardly too far and supporting it in its open position.

From the foregoing description taken in connection with the accompanying drawings, it is thought that the construction and operation of the invention will be readily understood without requiring a more extended explanation, and therefore the same has been omitted.

What is claimed is:

1. The combination with a piano-forte having a key bed, a plurality of operating keys thereon, and a compartment below said bed, of a piano playing attachment comprising a pair of swinging arms pivotally connected at their inner ends with the ends of the said piano-forte, pneumatic key operating means having pivotal connection with the outer ends of said arms for positioning the said means above the keys and within the compartment, a tracker board slidably connected below the key bed and having communication with the pneumatic key operating means, music sheet operating means, a motor operating said sheet operating mechanism, and a main exhaust bellows having connection with the motor and pneumatic operating means.

2. The combination with a piano-forte having a key bed, a plurality of operating keys thereon, and a compartment below said bed, of a piano playing attachment comprising a pair of swinging arms pivotally connected at their inner ends with the ends of the said piano-forte, pneumatic key operating means having pivotal connection with the outer ends of said arms for positioning the said means above the keys and within the compartment, a tracker board slidably connected below the key bed and having communication with the pneumatic key operating means, music sheet operating means, a motor operating said sheet operating mechanism, a main exhaust bellows having connection with the motor and pneumatic operating means, and means adjusting the pneumatic key operating means relative to the keys.

3. The combination with a piano-forte having a key bed, a plurality of operating keys thereon, and a compartment below said bed, of a piano playing attachment comprising a pair of swinging arms pivotally connected at their inner ends with the ends of the said piano-forte, pneumatic key operating means having pivotal connection with the outer ends of said arms for positioning the said means above the keys and within the compartment, a tracker board slidably connected below the key bed and having communication with the pneumatic key operating means, music sheet operating

means, a motor operating said sheet operating mechanism, a main exhaust bellows having connection with the motor and pneumatic operating means, means adjusting the pneumatic key operating means relative to the keys, and means for raising and lowering said pneumatic key operating means independently of the adjusting means.

4. The combination with a piano-forte having a key bed, a plurality of operating keys thereon, and a compartment below said bed, of a piano playing attachment comprising a pair of swinging arms pivotally connected at their inner ends with the ends of the said piano-forte, pneumatic key operating means having pivotal connection with the outer ends of said arms for positioning the said means above the keys and within the compartment, a tracker board slidably connected below the key bed and having communication with the pneumatic key operating means, music sheet operating means, a motor operating said sheet operating mechanism, a main exhaust bellows having connection with the motor and pneumatic operating means, means adjusting the pneumatic key operating means relative to the keys, means for raising and lowering said pneumatic key operating means independently of the adjusting means, and a front hinged to the piano-forte and normally closing the said compartment therein for concealing the pneumatic key operating means when moved within said compartment.

5. The combination with a piano-forte

having a key bed, a plurality of operating keys thereon, and a compartment below said bed of a piano playing attachment comprising a pair of swinging arms pivotally connected at their inner ends with the ends of the said piano-forte, pneumatic key operating means having pivotal connection with the outer ends of said arms for positioning the said means above the keys and within the compartment, a tracker board slidably connected below the key bed and having communication with the pneumatic key operating means, music sheet operating means, a motor operating said sheet operating mechanism, a main exhaust bellows having connection with the motor and pneumatic operating means, means adjusting the pneumatic key operating means relative to the key, means for raising and lowering said pneumatic key operating means independently of the adjusting means, a front hinged to the piano-forte and normally closing the said compartment therein for concealing the pneumatic key operating means when moved within said compartment, and means carried by the pneumatic key operating means and the front respectively, for sustaining the said front in position for closing the compartment.

In testimony whereof I affix my signature in presence of two witnesses.

WALTER KIRKEGAARD.

Witnesses:

MARY A. HAWTHORNE,
JAY FULLER.