



1,191,161.

Patented July 18, 1916.  
 2 SHEETS—SHEET 2.

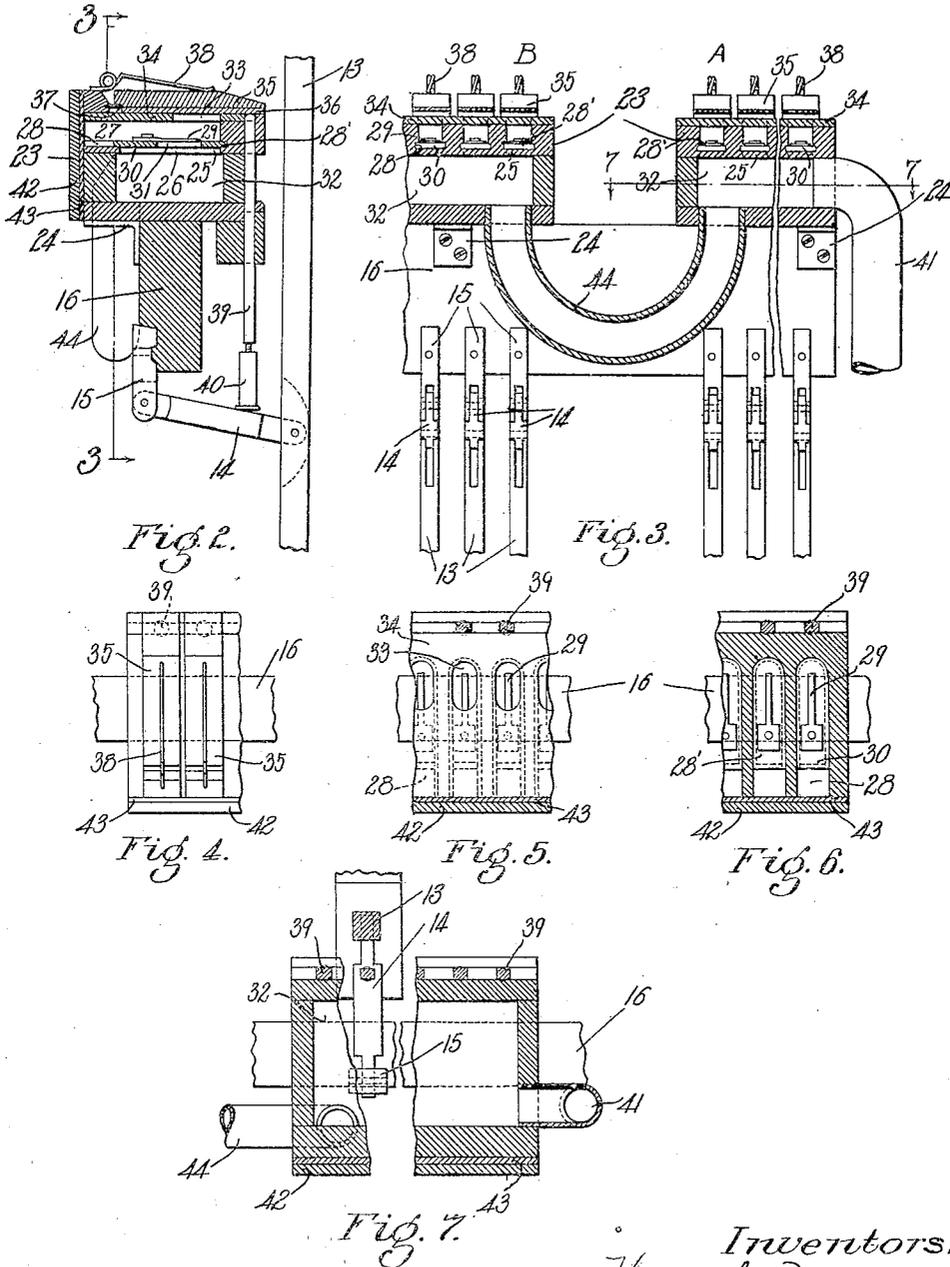


Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

Fig. 7.

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# UNITED STATES PATENT OFFICE.

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## MUSICAL INSTRUMENT.

1,191,161.

Specification of Letters Patent.

Patented July 18, 1916.

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*To all whom it may concern:*

Be it known that we, THOMAS J. DAY and WILLIAM A. URICH, citizens of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Musical Instruments, of which the following is a specification.

This invention relates to improvements in musical instruments and more particularly to the type of musical instrument known as the player piano.

The object of the invention is to provide a device which will give a musical or orchestral effect to the piano in addition to and in conjunction with the regular notes and which may be operated simultaneously with the portion of the piano action which produces the notes.

The invention consists in the combination and arrangement of parts whereby the above object and certain other objects hereinafter appearing may be attained, as set forth in the following specification and particularly pointed out in the claims.

Referring to the drawings: Figure 1 is a vertical section through a piano of the upright type with an apparatus constructed and arranged to produce the results hereinbefore set forth shown in connection therewith. Fig. 2 is a transverse section through the reed attachment illustrating the manner in which the same is attached to the piano action. Fig. 3 is a section taken on the line 3—3 of Fig. 2 illustrating the manner in which two sections of wind chests for the groups of reeds, which are separated by portions of the frame of the piano, are connected together. Fig. 4 is a plan view of a pair of reed cells. Fig. 5 is a plan view similar to Fig. 4 illustrating the valves, by means of which air is admitted to the reed cells, removed. Fig. 6 is a plan section through a pair of reed cells. Fig. 7 is a sectional plan view through the wind chest located beneath the reeds and their cells, taken on the line 7—7 of Fig. 3.

Like numerals refer to like parts throughout the several views of the drawings.

In the drawings, 10 is the casing of a piano.

11 denotes the piano action and includes the usual instrumentalities for producing sound by means of hammers, said mechanism or action embodying in its construction the usual whips 12, stickers or action lifters 13, sticker levers 14 and flanges 15. Said flanges are secured to the usual back or action rail 16. The above mentioned parts, with the exception of the back or action rail 16, are duplicated at each string and are capable of being operated either by manual keys 17, which preferably engage the lower ends of the sticker or action lifters 13. Said hammer actuating means may also be operated by means of striking pneumatics 18, 18 which may be of any well known construction and constructed and arranged to be operated by the suction or air pressure produced in a wind chest or air chamber 19 by the operation of suitable exhausters, one form of which has been indicated at 20. A pedal 21 is operatively connected to the exhauster 20 permitting said exhauster to be moved by the foot of the operator to exhaust the air from the main wind chest 19 in a manner well known to those skilled in the art.

The piano action for each separate note or string of the instrument is operatively connected by means of a rod 22 to one of the striking pneumatics 18, said rods 22 being shown engaging the manual keys 17 of the instrument. This particular manner of arranging the connection between the striking pneumatics and the piano action is but one of a large number of ways in which this particular function may be performed, but any one of said numerous methods may be employed in conjunction with the more important features of the invention without departing from the spirit and scope thereof.

In substantially all types of piano actions a cross piece or support, otherwise known as the back or action rail hereinbefore mentioned, is employed. To said action rail, which is designated as 16, a casing 23 is secured. This casing preferably rests upon the upper edge of said rail 16 and is secured thereto by an angular bracket 24. The casing 23 has a chamber 32 constituting a secondary wind chest extending substantially

the length of the piano or at least coextensive with the number of keys to be provided with a reed.

One wall of the casing 23, preferably the upper wall 25, is provided with an opening 26 which has communication with a reed cell or holder 27 surrounding the opening 26. A transversely disposed slot 28 is arranged immediately above the opening 26 and receives a reed 28' of the usual and well-known construction and consisting of a resilient vibratory strip of metal or tongue 29, or other suitable material secured to a suitable plate 30 having a recess 31 extending therethrough about equal in size to the vibratory member 29.

The number of reeds employed may vary or one may be provided for each note. The size of the vibratory portion of said reed and the recess within which it is located varies according to the tone which is to be produced thereby, said tone corresponding with the tone of the string of the instrument with which it is to cooperate. Each reed cell 27 is provided with an inlet orifice 33 preferably arranged in the upper wall 34 of the casing within which said reed cells 27 are formed.

A valve 35 is constructed and arranged to normally close the orifice 33 of each of said reed cells, said valves each having a facing 36 of resilient material such as felt which covers the orifice 33 and prevents the leakage of air therethrough. The valves 35 are preferably pivotally connected at 37 to the casing which contains the reed cells 27, said valves being yieldingly retained in their closed positions by springs 38.

Each of the valves 35 is operatively connected with the manual key or to the action lifter of the note corresponding to the reed thereof, preferably the latter, said connection preferably consisting of a valve plunger 39 arranged to reciprocate in the casing 23 in contact with the free end of the valve 35. An adjustable end 40 is provided for said valve plunger and engages the sticker lever 14, said valve plunger being reciprocated by said sticker lever each time said sticker lever is rocked by its manual key or by means of the striking pneumatic operatively connected thereto. The air within the wind chest or air chamber 32 is exhausted through a tube 41 preferably extending from one end of said chamber 32 to the wind chest 19.

Each of the reed cells 27 extends to the rear of the casing containing said cells permitting access to each cell and the reed contained therein. A bung 42 extends the entire length of the casing 23 over the ends of said cells for the purpose of sealing the openings thereof. A bushing 43 is interposed between said bung and the adjacent wall of said casing to insure the prevention of any leakage of air therethrough.

If desired the casing 23 may be made in sections as at "A" and "B" to facilitate the handling thereof or to clear portions of the frame of the piano. When so separated the sections "A" and "B" may be connected together by short sections 44 of tubing, thus permitting air to be drawn from all sections of said casing through the tube 41 to the wind chest 19.

The operation of the mechanism is as follows: When a note is struck on the instrument by the operation either of one of the manual keys 17 or one of the striking pneumatics 18 in a manner well known to those skilled in the art, the sticker or action lifter 13 will be elevated together with the striker lever 14. Simultaneously or conjointly with this action the valve plunger 39 will also be elevated, the upper end of said plunger contacting with the free end of the valve 35 lifts said valve from its seat and permits air to rush into the reed cell 27 and through the recess 31 of the reed into the supplementary wind chest or air chamber 32 from whence it will be withdrawn through the main wind chest 19. As the air rushes through the recess 31 the tongue 29 located therein will be vibrated, thereby producing a tone simultaneously with the tone produced by the striking of the string of the piano.

While we have herein shown one arrangement and embodiment of the invention and discussed in detail the construction and arrangement incidental to the specific application thereof, it is to be understood that the invention is limited neither to the mere details nor to the specific application herein shown, but that extensive deviations from the illustrated form or embodiment of the invention may be made without departing from the principles thereof.

Having thus described our invention what we claim and desire by Letters Patent to secure is:

1. A piano having, in combination, a piano action, an action rail therefor, a casing mounted upon said action rail at the rear of said piano action and between said action and the strings of said piano, said casing being provided with a reed cell, a reed arranged in said cell, a wind chest having communication with said reed cell, a valve adapted to regulate the passage of air through said reed, and means connecting said valve with said piano action constructed and arranged to operate said valve simultaneously with said piano action.

2. A piano having, in combination, an action rail, a piano action, an action lifter therefor, a sticker lever pivotally attached to said action rail and said action lifter and adapted to control the movements of said action lifter, a casing mounted upon said action rail between said action lifter and the strings of said piano, said casing being pro-

vided with a reed cell, a reed arranged in  
said cell, a wind chest having communication  
with said reed cell, a valve adapted to regu-  
late the passage of air through said reed,  
5 and an adjustable valve plunger mounted on  
said casing between said valve and said  
sticker lever and adapted to be engaged by  
said sticker lever during the operation of  
said action lifter, to operate said valve.

In testimony whereof we have hereunto set 10  
our hands in presence of two subscribing  
witnesses.

THOMAS J. DAY.  
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Witnesses:

SYDNEY E. TAFT,  
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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,  
Washington, D. C."