

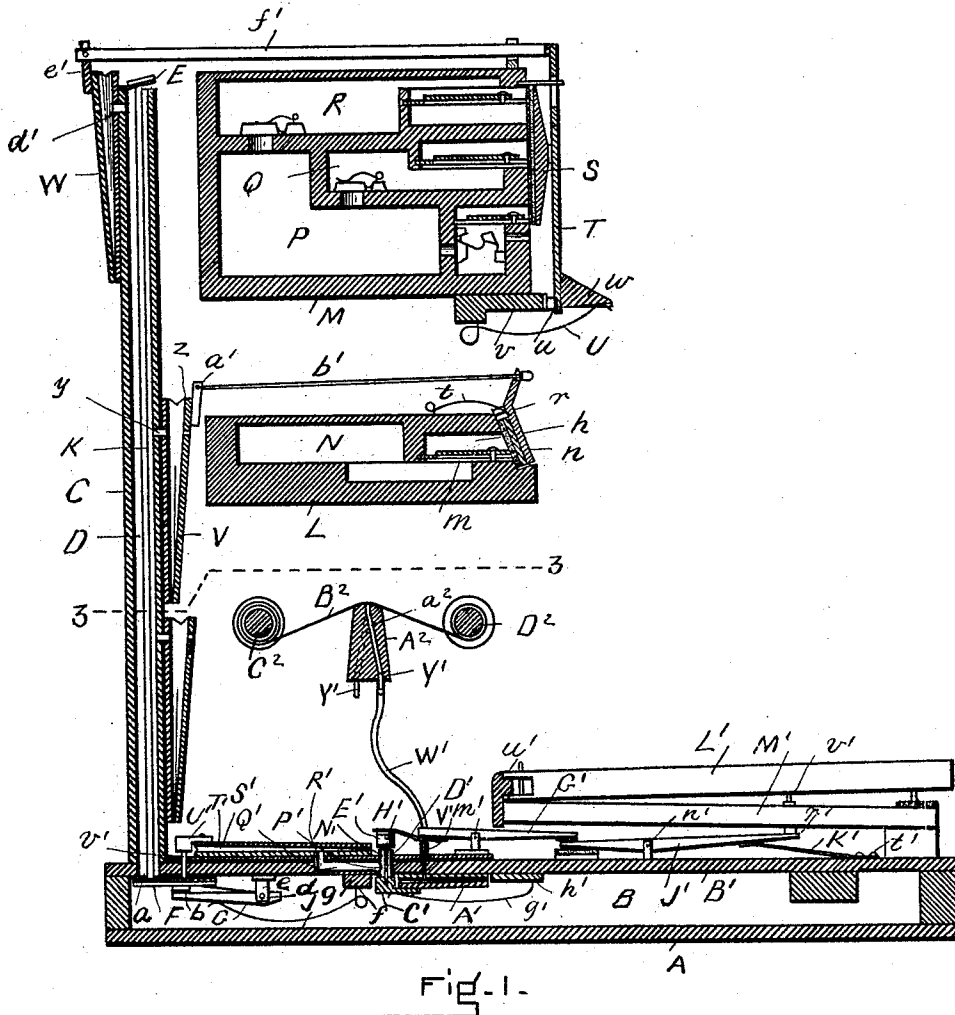
(No Model.)

3 Sheets—Sheet 1.

G. B. KELLY.  
MECHANICAL MUSICAL INSTRUMENT.

No. 517,805

Patented Apr. 3, 1894.



WITNESSES

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*Charles B. Hunt*

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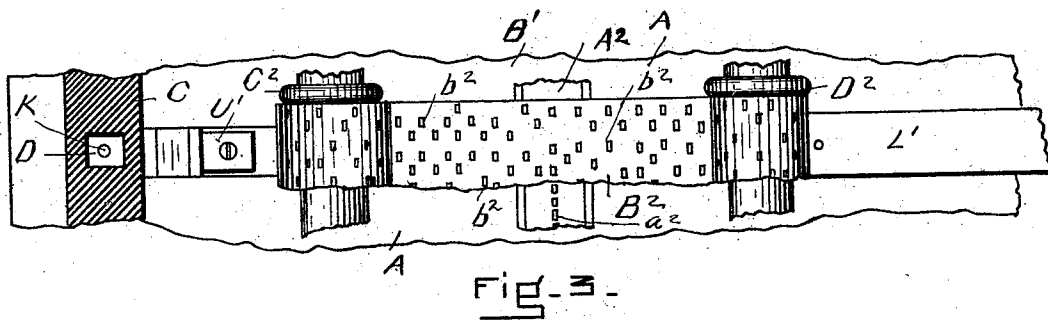
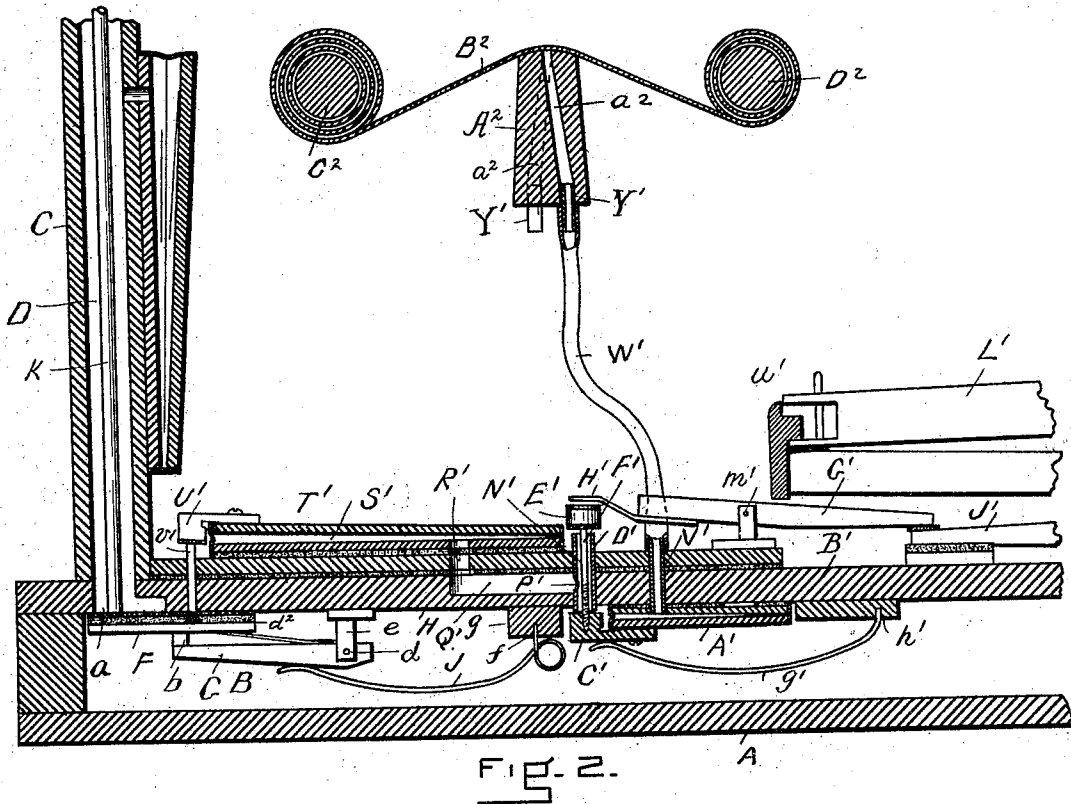
(No Model.)

3 Sheets—Sheet 2.

G. B. KELLY.  
MECHANICAL MUSICAL INSTRUMENT.

No. 517,805.

Patented Apr. 3, 1894.



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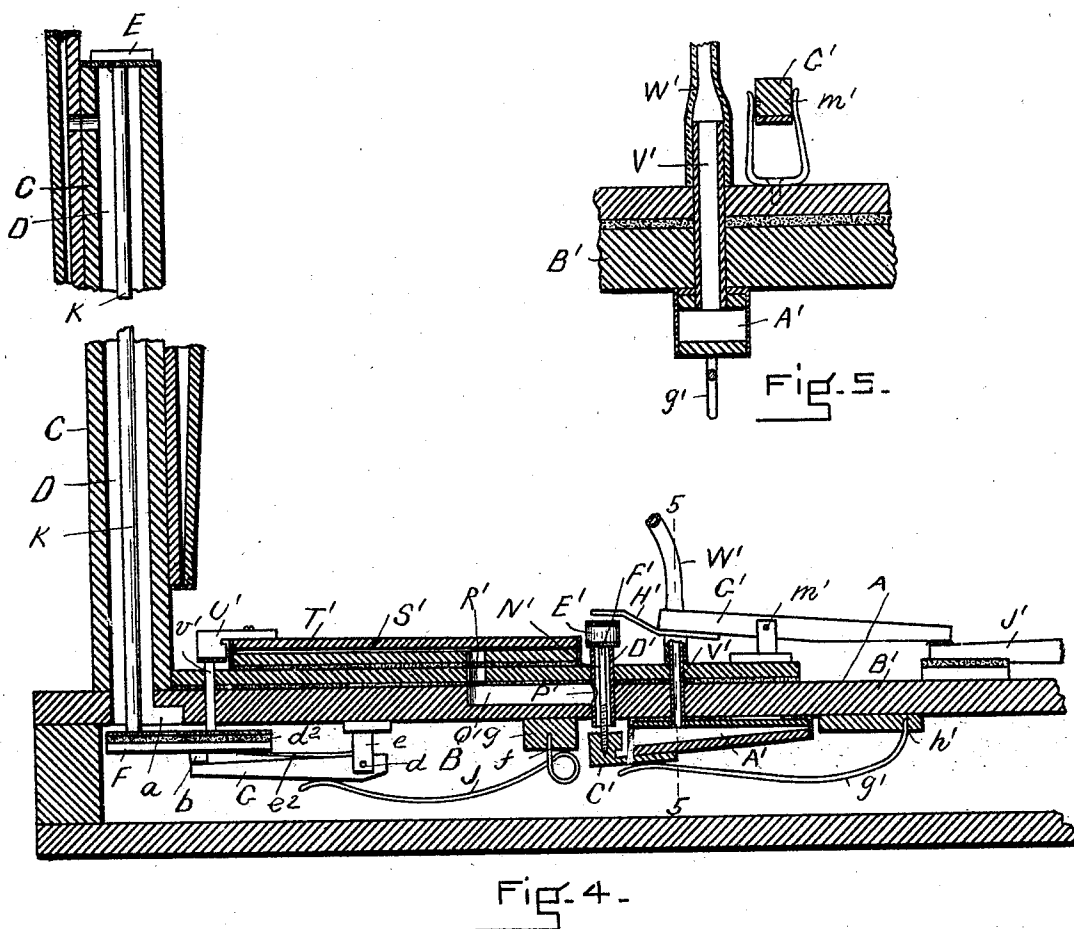
(No Model.)

3 Sheets—Sheet 3.

G. B. KELLY.  
MECHANICAL MUSICAL INSTRUMENT.

No. 517,805.

Patented Apr. 3, 1894.



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# UNITED STATES PATENT OFFICE.

GEORGE B. KELLY, OF BOSTON, MASSACHUSETTS.

## MECHANICAL MUSICAL INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 517,805, dated April 3, 1894.

Application filed May 15, 1893. Serial No. 474,307. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE B. KELLY, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Mechanical Musical Instruments, of which the following is a full, clear, and exact description.

This invention relates to a mechanical musical instrument operated by a perforated strip of suitable sheet material, more particularly, although applicable to reed organs, and the invention consists of a certain construction and arrangement of pneumatic bellows for operation in combination with the valves to musical reeds or other sounding devices, all substantially as hereinafter fully described reference being had to the accompanying sheets of drawings in which is illustrated the present invention in its application to a reed organ, in connection with a perforated music strip.

Figure 1 is a vertical section from the front to the rear. Fig. 2 is a similar section of the lower portion of Fig. 1 enlarged. Fig. 3 is a detail plan view line 3—3 Fig. 1. Fig. 4 is a similar section to Fig. 2, but with some of the parts in different positions. Fig. 5 is a detail vertical section on line 5—5 Fig. 4.

In the drawings A represents a frame or box in which is the wind chest chamber B of a reed organ, which is connected in any suitable manner to the usual exhaust bellows of the organ but which is not shown, and needing no particular description herein.

At one end of the wind chest is secured an upright C having a vertical air passage D through it, which communicates at its lower end with the wind chest chamber at *a*, and at its upper end is a small valve E which is arranged to fit over and close upon the upper open end of the vertical passage D. Below the opening *a* in the wind chest chamber is a valve F flexibly connected at *b* to a horizontal lever G pivoted at *d* to a lug *e* of the upper board H on the under side of which lever bears the free end of a spring J secured at *f* to a block *g* of the board H. Within the vertical air passage D is a rod or wire K which rests on the valve F in the wind chest, and it is of such a length, that when the valve F is closed, the wire or rod will project a short distance above the upper end of the tube or upright

C on which the small valve F will rest, and thus be held open as shown in Fig. 1.

L, M, are horizontal reed boards one above the other in the same vertical plane and secured to a suitable support, the lower one L having an air chamber N, a reed cell *h* and a reed *m* arranged and located therein as usual in reed organs, and communicating in the usual manner with the wind chest, and the upper reed board M has three separate reed chambers P, Q, R, and reed cells and reeds, as shown in Fig. 1 which communicate with the wind chest through the chamber P in the usual manner. The reed cell *h* to the lower reed has a valve *n* pivoted at *r* and extending down over the opening to the reed cell, which valve is held to its seat by a spring *t*. The three reed cells in the upper board are closed at their openings by one long valve S pivoted at *u* to an arm *v* of the reed board M. The strip T to which this valve is attached, has at its lower end near its hinge an arm *w* which projects therefrom and against the under side in a longitudinal groove bears the free end of a spring U secured to the arm *v* by which the valve is held to its seat over the three reed cell openings.

On the side of the vertical standard C toward the lower reed board is secured as shown a pneumatic bellows V which communicates by an air passage *y* with the vertical air passage D, and its movable board Z has attached to it an upwardly extending arm *a'* to which the valve *n* of the reed cell *h* in line therewith is secured by a rod *b'* pivoted to said arm. There is another pneumatic bellows *w* on the opposite side of the standard C and it has communications with the air passage D by an opening *d'* its movable board having an arm *e'* to which is attached a rod *f'* which extends along to the front and passes freely through a guide post of the reed board in position for its end to abut against the valve strip T of the valve S. All these connecting rods are arranged to be adjusted as to their length so that when the pneumatic bellows are open their respective valves will be closed.

A' is a pneumatic bellows in the wind chest chamber, and secured to the under side of the top board B' of the chest, an arm or valve C' secured to its movable board and project-

ing beyond the bellows being arranged to bear when the bellows is closed against the lower end of a short vertical tube D' secured in the top board, and held to its seat thereon  
 5 by a spring g' secured to the wind chest board at h' and bearing on the valve C'.

E' is a block or valve which has secured to its under side a downwardly projecting wire or pin f' extending centrally down through  
 10 the tube D' and screwed into the upper side of the block or valve C' of the pneumatic bellows A'.

On the upper side of the wind chest board is pivoted at m' a lever G' having secured to it at one end a flat flexible strip H' which extends forward and is disposed just over the valve E'. Under the other end of this lever  
 15 G' is the end of a lever J' pivoted at n' to the board, a spring K' bearing against the under side of its end r' secured to the board at l'.

L' is a key pivoted or hinged at u' and it has a pin v' which passes freely down through an opening in the key frame board M' and rests upon the upper side of the end r' of the lever J'.  
 25

The tube D' forms an air passage N' between the outside and inside of the wind chest chamber it being of a length to project a short distance above and below the wind chest board so that the valves will have a seat thereon, and not touch the chest board, to close the passage free and clear of the board, the tube having an opening P' in its side, which opens into one end of a horizontal air passage Q' in the board B' which at its other end communicates by a passage R' with the chamber S' of a pneumatic bellows T' secured on top of the chest board, an arm secured to the free end of its movable board projecting beyond  
 30 it, bearing or resting by its under side on a pin or wire v' adapted to freely pass through the board B' and rest upon the top side of the valve F'.

V' is a small vertical tube extending through  
 45 the wind chest board, its lower end opening into the chamber of the pneumatic bellows A' and its upper end projecting a short distance above the board just back of the lever G' over which is secured the end of a tube W' of any suitable material, the other end of the connecting tube W' being closed over the end of a small short tube Y' secured in the under side of a horizontal block A<sup>2</sup> and communicating with a vertical passage a<sup>2</sup> therein, which  
 55 passage extends up through the block, and is open at its upper surface to the air, over which block is arranged to travel a strip B<sup>2</sup> of perforated sheet material, which is wound upon a spool or roll C<sup>2</sup> adapted to revolve upon a suitable support, and to run therefrom to and be wound upon another spool or roll D<sup>2</sup> arranged to revolve upon a support.

The operation of the instrument is as follows: Air being exhausted from the wind chest in the usual manner, with an unperforated  
 65 portion of the music sheet B<sup>2</sup> over the opening a<sup>2</sup> in the block A<sup>2</sup> the parts will all be in

their normal positions as shown in Figs. 1 and 2, that is, the pneumatic bellows A' in the wind chest chamber closed, the other pneumatic bellows T' on the outside open, the valve  
 70 F closed, the valve E at upper end of vertical passage D open, and the reed valves closed. The pneumatic bellows A' being closed, its valve C' closes the lower end of the tube D' to the passage of air therethrough; as the perforated strip travels over the horizontal block or raceway A<sup>2</sup>, immediately a perforation b<sup>2</sup> comes over the opening a<sup>2</sup> in the block  
 75 A<sup>2</sup> it allows air to enter therein from its upper end which passes down through the tube W' to and into the pneumatic bellows A', which it opens, moving its board down and with it the valve E', which then rests and bears on the upper end of the tube D', closing it to air therethrough from the outside  
 80 but opening the lower end of the tube to the passage of air into the wind chest which passes into the tube through the side opening P', which causes the pneumatic bellows T' to close its movable board and block U' to move down and press open the valve F in the wind chest by its pin v', allowing air to then pass down through the vertical passage D consequently exhausting air from the pneumatic  
 85 bellows V and w connected therewith, closing their movable boards upon them, and through their rod connection with the reed valves S and h opening them which allows air to enter the reed cells and pass through the reeds sounding the same, which passes therefrom down through the various passages into the wind chest; as soon as the valve F is opened the valve E is closed by gravity, the rod following downward the valve F, and  
 90 as soon as an unperforated portion of the perforated sheet comes over the block opening a<sup>2</sup> air ceases to pass down therethrough, consequently closing the reed valves, pneumatic bellows in the wind chest, and opening the pneumatic bellows T' outside which allows the valve F to close the opening to the vertical passage D closing the valve E and returning all parts to their normal positions, ready for another operation of the same as before. As  
 95 the valve F is connected to its lever G by a flexible connection b it is apt when moving down to open to have its end d<sup>2</sup> move first, being operated by the bellows T' which interferes with a quick and full opening of the air passage D in the upright C, and to obviate this and make the valve open straight or square, a preferably light spring e<sup>2</sup> is secured to the lever which bears by its free end against the under side of the end of the valve  
 100 which serves to retard or hold back such end and cause the other end to move down quickly, or as soon as the end d<sup>2</sup> so that the valve will be moved down practically in a straight or parallel line, which insures a full opening of the passage D to the air at once.  
 105

When not using the perforated sheet, the instrument can be played by the key as in pressing down the key it swings the lever J'

on its pivot  $n'$ , which in turn operates the lever  $G'$  to move the valve  $E'$  down to and upon its seat on the upper end of the tube  $D'$  and open its lower end by pressing down the valve  
 5  $C'$  of the pneumatic bellows  $A'$  away from its seat on the lower end of the tube  $D'$  opening it as before to the passage of air into the wind chest as described for the perforated sheet.

The instrument can be played by the use  
 10 of the perforated music sheet and the keys at the same time or separately and independently of each other.

A metal tube for an air passage to the pneumatic bellows as shown having its ends  
 15 project a short distance above and below the board, in which it is secured, secures it always in position for close seats, for its respective valves, it is permanent and fixed, and not affected by the temperature, as is often the  
 20 case when the air passage is made in the board and the valve seat thereon, as in such case the swelling and shrinking of the wood affects the closeness of the valve to the seat more or less and causes it to leak correspond-  
 25 ingly, and it also secures a seat that is free from dust and dirt that usually collects on the top board.

The drawings only show the parts necessary to sound one note of the instrument, but as  
 30 is obvious the parts can be duplicated for all the notes, making the full compass of the instrument.

As is obvious any suitable sounding device can be used in lieu of reeds, such as  
 35 pipes, &c., for instance,—the invention not being limited to an organ having reeds for the sounding devices; also a more or less number of reed boards can be used as desired.

Having thus described my invention, what  
 40 I claim is—

1. In a reed organ, a wind chest, a stand-  
 ard or upright, a vertical air passage in said  
 standard communicating with the wind chest,  
 45 a pneumatic bellows communicating with the vertical passage, a reed valve connected to said pneumatic bellows, a valve in the wind chest to said vertical passage, a pneumatic  
 bellows outside of said wind chest, arranged  
 to operate said valve, an air passage between  
 50 said last pneumatic bellows and the wind chest, and a pneumatic bellows valve in the wind chest operated and controlled by and  
 through the means of a perforated music  
 sheet, arranged to travel over an air passage  
 55 leading to said pneumatic bellows in the wind chest.

2. In a reed organ, a wind chest, a series of  
 reed boards arranged in a vertical plane one  
 above the other, each having a reed chamber,  
 60 a reed cell, a valve to such cell, a standard or upright having a vertical air passage, communicating with the wind chest, pneumatic  
 bellows secured to said standard and having  
 communication with its air passage, and each  
 65 connected to a valve of a reed cell, a valve in the wind chest to said vertical passage, a

pneumatic bellows outside of said wind chest,  
 arranged to operate said valve, an air passage  
 between said last pneumatic bellows and the  
 wind chest and a pneumatic bellows valve in  
 70 the wind chest operated and controlled by and through the means of a perforated music  
 sheet arranged to travel over an air passage  
 leading to said pneumatic bellows in the wind  
 chest.

3. In an organ, a wind chest, a metal tube  
 extending through one wall of the wind chest,  
 each end projecting a short distance beyond  
 each side of the thickness of the wall, and  
 two valves one to each end of said tube and  
 80 rigidly connected together.

4. In an organ, a wind chest, a metal tube  
 extending through one wall of the wind chest,  
 each end projecting a short distance beyond  
 each side of the thickness of the wall, and  
 85 two valves, one to each end of said tube, and adjustably connected together.

5. In an organ, a wind chest, a metal tube  
 extending through one wall of the wind chest,  
 each end projecting a short distance beyond  
 each side of the thickness of said wall, and  
 90 two valves one to each end of said tube and rigidly connected together by a wire extend-  
 ing through said tube.

6. In an organ, a wind chest, a metal tube  
 95 extending through one wall of the wind chest, each end projecting a short distance beyond  
 each side of the thickness of said wall, and two valves one to each end of said tube and  
 connected together by a wire rigidly secured  
 100 to one valve and screwing into the other.

7. In an organ, a wind chest, a metal tube  
 through one wall of the wind chest, each end  
 projecting a short distance beyond each side of  
 the thickness of the wall for a seat for a valve,  
 105 a chamber connected with a pneumatic bellows, and an opening in the side of said tube  
 communicating with said chamber.

8. A valve to an air passage, a pivoted lever  
 to which said valve is secured at or near its  
 110 central portion, and a spring secured to a support and bearing on one end of said valve for  
 the purpose specified.

9. A valve to an air passage, a pivoted lever  
 to which said valve is secured at or near its  
 115 central portion, and a spring secured to the lever and bearing on one end of said valve for  
 the purpose specified.

10. In a reed organ, a wind chest, a series  
 of reed boards arranged in a vertical plane  
 120 one above the other, each having a reed chamber, a reed cell, a valve to such cell, a stand-  
 ard or upright having a vertical air passage, communicating with the wind chest, pneumatic  
 bellows secured to said standard and  
 125 having communication with its air passage and each connected to a valve of a reed cell,  
 a valve in the wind chest to said vertical passage, a pneumatic bellows outside of said wind  
 chest arranged to operate said last valve, an  
 130 air passage between said last pneumatic bellows and the wind chest, a pneumatic bellows

valve to said air passage, and a key pivoted to a support, and arranged to operate said pneumatic bellows valve.

11. In a reed organ, a wind chest, a series  
5 of reed boards arranged in a vertical plane one above the other, each having a reed chamber, a reed cell, a valve to such cell, a standard or upright having a vertical air passage, communicating with the wind chest, pneu-  
10 matic bellows secured to said standard and having communication with its air passage and each connected to a valve of a reed cell, a valve in the wind chest to said vertical pas-  
15 sage, a pneumatic bellows outside of said wind chest arranged to operate said last valve, an air passage between said last pneumatic bellows and the wind chest, a pneumatic bel-  
20 lows valve to said air passage, a lever arranged to operate said pneumatic bellows valve, a key pivoted to a support and a lever between key and said pivoted lever for opera-  
tion thereof.

12. In a reed organ, a wind chest, a stand-  
ard or upright, a vertical air passage in said

standard communicating with the wind chest, 25  
a pneumatic bellows communicating with the vertical passage, a reed valve connected to said pneumatic bellows, a valve in the wind chest to said vertical passage, a pneumatic bellows outside of said wind chest, arranged 30  
to operate said valve, a tube forming an air passage between the outside and inside of the wind chest, an air passage between said pneu-  
matic bellows and said tube passage, a pneu-  
matic bellows in said wind chest, a valve at- 35  
tached thereto to close said tube air passage, a passage communicating with the wind chest and leading to and opening to the outer side  
of a block or raceway and a perforated music  
sheet arranged to travel over said block or 40  
raceway opening.

In testimony whereof I have hereunto set  
my hand in the presence of two subscribing  
witnesses.

GEORGE B. KELLY.

Witnesses:

EDWIN W. BROWN,  
LEONA C. ARNO.