(No Model.) 2 Sheets—Sheet 1.

W. D. PARKER.

PNEUMATIC WIND MUSICAL INSTRUMENT.

No. 394,006. Patented Dec. 4, 1888.

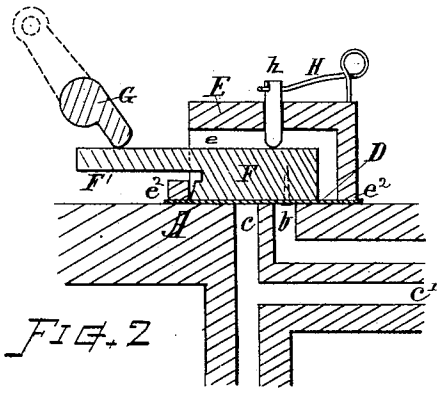

FIG. 2

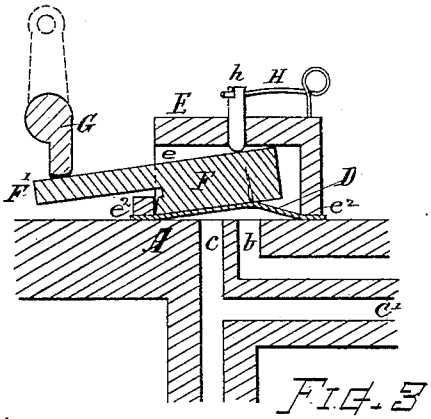

FIG. 3

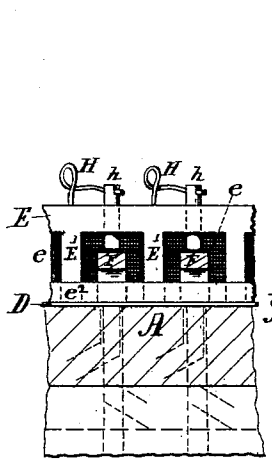

FIG. 4

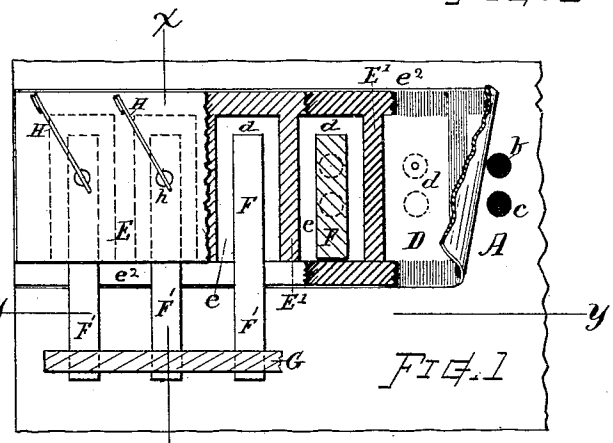

FIG. 1

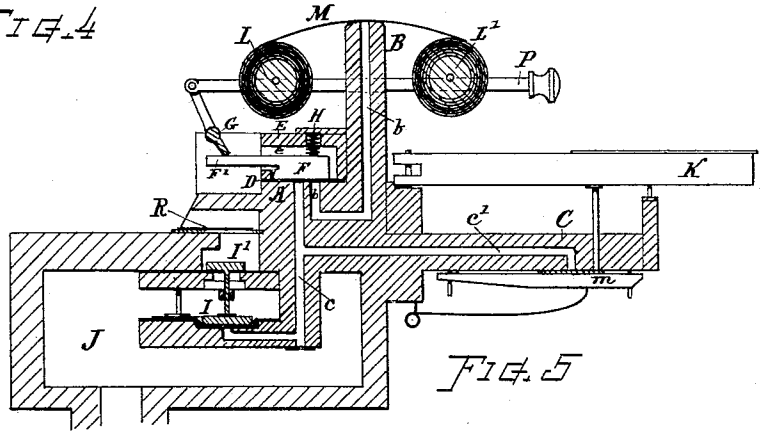

FIG. 5

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(No Model.) 2 Sheets—Sheet 2.

W. D. PARKER.

PNEUMATIC WIND MUSICAL INSTRUMENT.

No. 394,006. Patented Dec. 4, 1888.

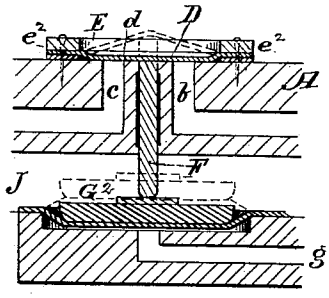

FIG. 6

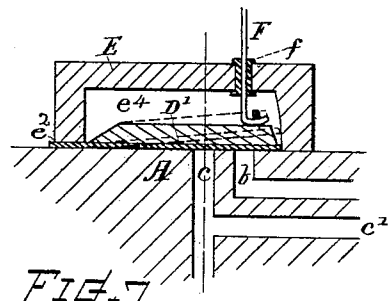

FIG. 7

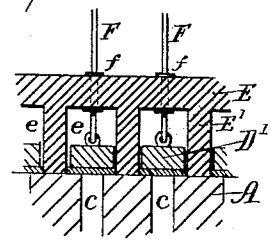

FIG. 8

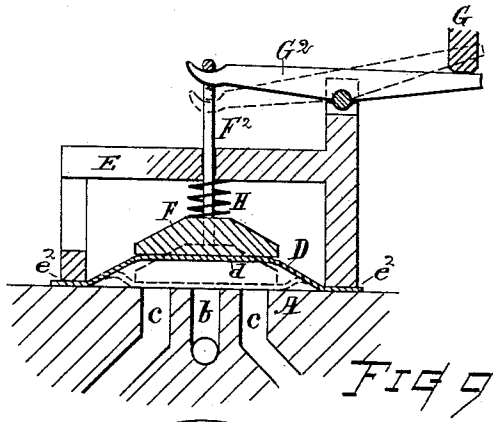

FIG. 9

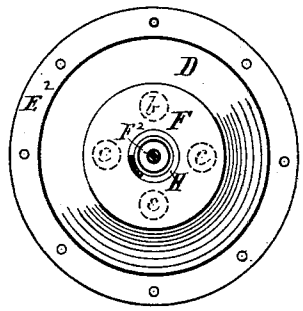

FIG. 10.

Witnesses.
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Inventor.
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By Chas. H. Burleigh,
Attorney.

UNITED STATES PATENT OFFICE.

WILLIAM D. PARKER, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO THE AEOLIAN ORGAN AND MUSIC COMPANY, OF MERIDEN, CONNECTICUT.

PNEUMATIC WIND MUSICAL INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 394,006, dated December 4, 1888.

Application filed May 7, 1888. Serial No. 273,092. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM D. PARKER, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Pneumatic Musical Instruments, of which the following, together with the accompanying drawings, is a specification sufficiently full, clear, and exact to enable persons skilled in the art to which this invention appertains to make and use the same.

The object of my present invention is to provide a simple, practical, and efficient pneumatic coupler for making and breaking pneumatic connections in musical instruments, said coupler being adapted for use in combination with the windways or air-inlet passages that lead to actuating-pneumatics from a manual-key action, and an automatic or music-sheet action in combination pneumatic organs and similar instruments, or for coupling the windways pertaining to separate sets of pneumatic actions in pneumatically-operated instruments of this class; also, for coupling octaves or other intervals in pneumatic instruments, or for coupling and uncoupling the tracker-ducts or windways to connect the actuating or controlling pneumatics in automatic musical instruments, to render the same or any part thereof operative or non-operative, at the will of the operator, by the manipulation of a suitable action-stop.

To this end my invention consists of a coupling device for stopping and connecting two or more pneumatic ducts or windways constructed and organized for operation as hereinafter explained, and in the combination of such coupling device with other parts in a pneumatic musical instrument action.

In the drawings, Figure 1 is a part plan part horizontal section showing my improved coupler. Fig. 2 is a vertical section at line *x x*, Fig. 1, showing the parts in uncoupled position. Fig. 3 is a similar section showing the parts in coupled position. Fig. 4 is a vertical section at line *y y*, Fig. 1. Fig. 5 is a vertical sectional view showing the adaptation of my pneumatic coupler in a combination-organ action. Figs. 6, 7, 8, 9, and 10 illustrate modifications of construction.

In the drawings, A denotes the action-board or seat-piece containing the windways, ducts, or pneumatic passages (two or more) which it is desired to couple and uncouple in the operation of the instrument. These pneumatic passages may be the ducts leading from a tracker-range to the pneumatics which operate or control the valves of sounding devices, or the pneumatic controlling-duct and a duct leading across to another octave or other interval; or, in other instances, said passages may be the controlling-ducts that lead to separate sets of pneumatics or to two parts of the action, or to any pneumatic devices that require to be coupled in similar manner.

As herein illustrated, I have shown my invention as employed in combination organs or instruments to be operated manually or mechanically, as desired, wherein *b* denotes the windway or passage from a tracker-range, the inlet-ducts of which are opened and closed by a traveling music-sheet; and *c*, the passage leading to the pneumatic that works or controls the valve of the reed-duct or sound-producing devices, while C′ is the windway from a tracker, the ducts of which are controlled by valves actuated by manual keys, the passages being located as in Fig. 5; but it will be understood that the general disposition and arrangement of the passages and parts of the instrument, except in their immediate connection with the coupler, can be such as most convenient or as required in any particular style of instrument wherein this coupler is employed.

The pneumatic passages at the position where they are to be coupled are severally brought to the surface of the seat-piece A and there terminate or have openings adjacent to each other, as indicated at *b* and *c*. (See Figs. 2 and 3.) Series of these passages corresponding to a set of reeds or scale of sound devices and their operating-pneumatics are disposed in series along an extended seat-piece, substantially as illustrated in Fig. 1, and at convenient distances apart to accommodate the reed-spacing or spacing of their pneumatic-valve operators.

D indicates a flexible diaphragm arranged over the open ends of the passages *b c* and resting on the seat-piece A, where it is re-

tained by a board or strip, E, provided with a series of chambers, *e*, corresponding with the position of the passages and with intermediate partitions, E′, which board is fixed on top of the seat-piece, its edges e^2 and partitions E′ resting upon the diaphragm D and holding it securely to the seat or action-board, excepting those portions, *d*, corresponding with the base of the chambers *e*, which are free and movable. The diaphragm, or that portion thereof which forms the valve for passages to be coupled, is thus closely confined to the seat about its circumscribing edges, while its central portion can rise and fall in relation to the surface of the seat without admitting the external air beneath the diaphragm.

F indicates a lifter attached to the diaphragm D, for raising the movable portion *d* of said diaphragm from the seat A while its edges are confined, thus forming a pocket which will establish pneumatic connection across the space between the ends of the passages *b* and *c*, while excluding the external air therefrom. Said lifter is in the present instance a block or strip of wood having an outwardly-extended arm, F′, and a flat head, which is secured in any suitable manner to the center of the diaphragm D. An operator, G, is provided for depressing the arm F′ to raise the diaphragm by the tilting of the block, as illustrated in Fig. 3. The operator G can be of any suitable construction, and is connected with a stop or pull, P, in suitable manner for operating the lifters when the stop P is drawn out. Said operator G can be a bar to simultaneously operate the entire series of lifters, or a finger to operate a single lifter or any number of them, one or more, as desired.

H indicates a spring for forcing the lifter and diaphragm down to the seat, where it acts as a valve to stop the passages *b* and *c*. This spring can be arranged in any suitable manner to act upon the coupler. In Figs. 1 to 4 it is shown as a bent wire acting on a pitman-pin, *h*, passed through the top of the board E; but any other arrangement of springs accomplishing equivalent result can be used, if preferred, and such springs can be placed within the chamber over the tops of the lifters; or the springs may in some cases be omitted where the gravity of the lifters or exhaust action in the passages is sufficient for closing down the diaphragm.

In Fig. 5 I have shown a coupler combined with a simple combination-organ. In this I indicates the pneumatic for operating the reed-duct valve I′. R is the reed or sounding device; J, the wind-chest, from which the air is exhausted in the usual manner by any well-known bellows or exhausting mechanism. B indicates the tracker-range for the music-sheet M, which is arranged to travel over the same by the winding-rolls L L′ in well-known manner for controlling the inlet of air to the ducts or passages *b*. C is a tracker-range having the series of ducts *c*′, controlled by valves *m*, actuated by manual keys K.

When the coupler is in position, as shown in Figs. 2 and 5, the pneumatics I will be controlled by action of the manual keys, the ducts of the music-sheet tracker B being then uncoupled or disconnected from the windways *c*, that lead to the pneumatics. Then by drawing the stop P the lifters F are caused to raise the diaphragm D, as in Fig. 3, thus coupling the ducts *b* of the tracker B with the passages *c*, leading into the pneumatics, and the pneumatics will then be under control of the music-sheet for playing in accordance with the perforations thereof. At the same time accompaniment may, if desired, be played manually by the keys K. Any well-known form of pneumatic can be substituted in place of pneumatic I, to be operated as explained.

My improved coupler may be employed for coupling octaves or other intervals, in which case the passage *c*, Figs. 2 and 3, may represent the controlling-passage connecting the tracker and the pneumatic, while the passage *b* may represent the cross-passage leading to the next octave or interval to be coupled therewith.

In Fig. 6 I have shown a modification of my coupler, wherein the lifter F is arranged to be actuated by a pneumatic, G^2, which can be worked by pressure induced by the instrument bellows or exhausters and rendered operative or non-operative for lifting the coupler-diaphragm D by opening and closing the pneumatic inlet-passage *g* in any well-known or convenient manner.

In Figs. 7 and 8 I have shown a modification in which the coupler-pocket is formed by a valve, D′, working within an air-tight chamber, e^4, the lifter in this instance being a rod or wire that passes through a close packing, *f*, and said lifter can be actuated by any suitable means for coupling and uncoupling the pneumatic passages.

In Figs. 9 and 10 I show a section and plan views of a modification adapted for simultaneously coupling with more than two pneumatic passages. In this the lifter F is connected to the center of a circular diaphragm, D, which is circumferentially attached to the seat in which the several passages terminate, and said lifter is provided with a rod, F^2, and lever G^2, for actuating said diaphragms, in connection with a device, G, for depressing the arm of the lever, and a coiled spring is employed for forcing the diaphragm or valve down to its seat.

Among the advantages incident to my invention may be mentioned its simplicity of construction and operation. The flexible diaphragm working in the direction of the exhaust effectually cuts off the pneumatic passages when uncoupled, while the close pocket formed when the diaphragm is raised prevents any leakage of external air into the passages.

What I claim as of my invention, and desire to secure by Letters Patent, is—

1. A coupler for pneumatic musical instruments, consisting of a seat having the pneumatic passages terminating thereat, in combination with a diaphragm or valve disposed thereon for closing said passages, with its circumscribing edges confined to said seat to exclude the entrance of air and its central part movable, and a lifter for raising the movable part of said diaphragm to form a pocket that pneumatically connects said passages, substantially as set forth.

2. In a pneumatic musical instrument, the combination of a seat having a plurality of pneumatic passages terminating thereat, a diaphragm or valve having its circumscribing edges confined to said seat to exclude the entrance of external air and its central part movable, a lifter for raising said diaphragm from the seat to form a pocket that pneumatically connects said passages, an operating-bar for actuating said lifter, and a stop or pull for throwing the same into and out of position, substantially as set forth.

3. In a pneumatic musical instrument, the combination, with a tracker, the pneumatics, and air ducts or passages leading thereto, of a chamber into which said passages or air-ducts open adjacent to each other, a movable valve or diaphragm for stopping said openings, closely confined at its edges, a lifter connected with said diaphragm for raising a portion thereof to allow air to pass from one duct into the other, and connections for working said lifter, substantially as and for the purpose set forth.

4. In a pneumatic musical instrument, the combination, with a set of sounding devices, their valves, pneumatics that govern the action thereof, and a seat-piece through which the pneumatic inlets and tracker-passages are carried and open in adjacent pairs, as *b c*, of the flexible diaphragm-strip D, covering the series of openings in said seat, the board E, fixed thereon, and having chambers *e*, with partitions E′ and edges e^2, that confine said diaphragm at a circumscribing limit about the several pairs of openings, the series of lifters F, severally attached to the diaphragm within the respective chambers and projecting therefrom in an arm, F′, the operating-bar G, and depressing-springs H, for the purposes set forth.

5. In a pneumatic musical instrument, the combination, with the sound devices and pneumatics that control the action of the same, of a music-sheet tracker and a manual-key tracker, each provided with air-ducts that jointly lead into said pneumatics, and a coupler disposed between one of the trackers and the pneumatics for coupling and uncoupling the ducts of said tracker.

6. The combination, with pneumatics I, having controlling-ducts *c*, of the music-sheet tracker B, having air-ducts *b*, the manual tracker having air-ducts *c*′, said ducts respectively leading to the pneumatic ducts *c*, and a coupler for coupling and uncoupling the air-ducts of the music-sheet tracker therewith, substantially as set forth.

Witness my hand this 28th day of April, A. D. 1888.

WILLIAM D. PARKER.

Witnesses:
CHAS. H. BURLEIGH,
ELLA P. BLENUS.