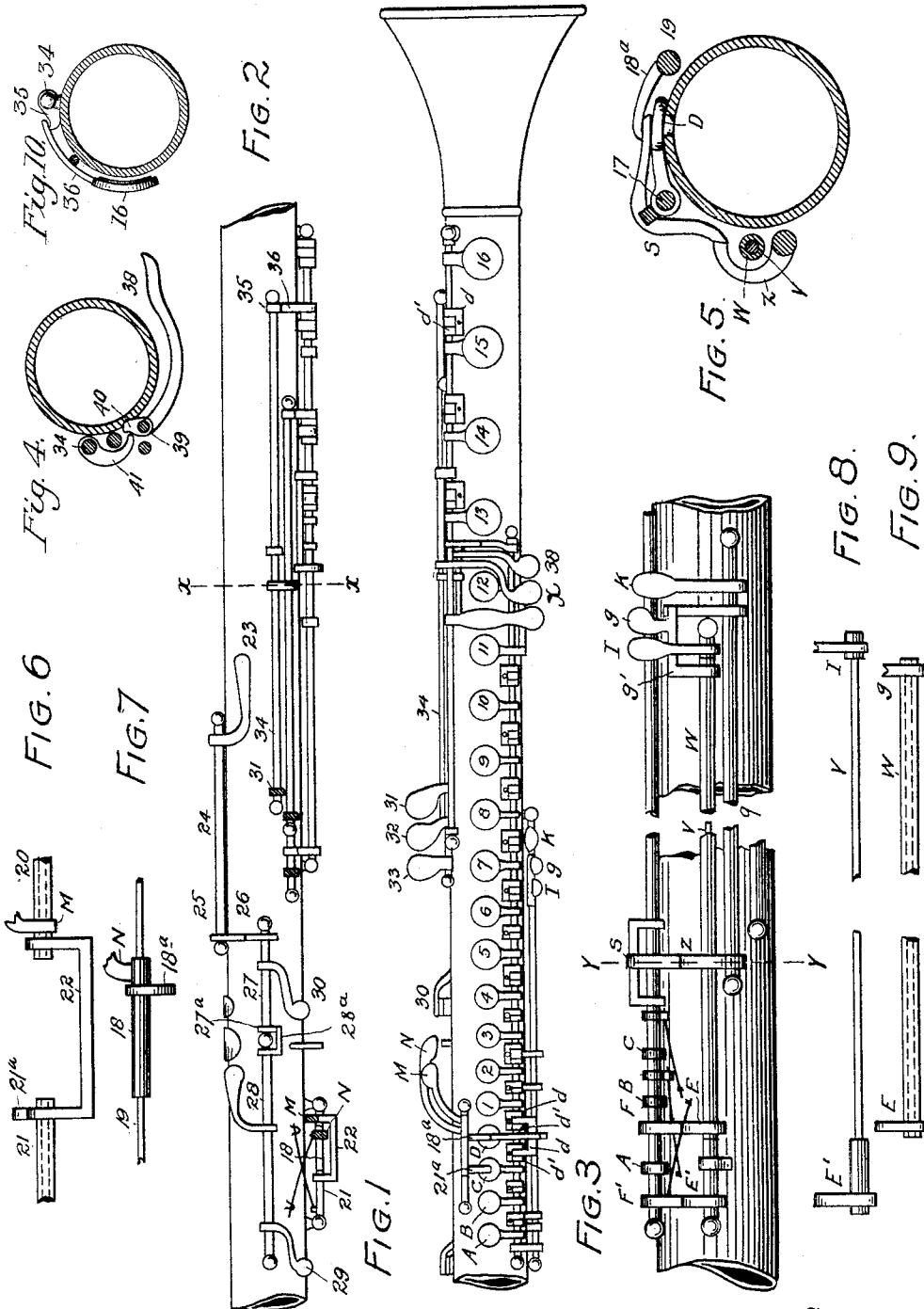


(No Model.)

P. J. DEVAULT.
WIND REED MUSICAL INSTRUMENT.

No. 583,194.

Patented May 25, 1897.



Witnesses
William R. W. Crea
Will H. Spurgeon

Inventor
Philip J. Devault
By his Attorney

UNITED STATES PATENT OFFICE.

PHILIP J. DEVAULT, OF CRIPPLE CREEK, COLORADO, ASSIGNOR OF ONE-HALF TO JOHN MIGNOLET, OF DENVER, COLORADO.

WIND REED MUSICAL INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 583,194, dated May 25, 1897.

Application filed July 3, 1896. Serial No. 598,933. (No model.)

To all whom it may concern:

Be it known that I, PHILIP J. DEVAULT, a citizen of the United States of America, residing at Cripple Creek, in the county of El Paso and State of Colorado, have invented certain new and useful Improvements in Wind Reed Musical Instruments; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to improvements in wind reed musical instruments, and while my improvements relate generally to this class of instruments I have shown them applied to a clarinet. My object is to complete and perfect the system of fingering this class of instruments set forth in United States Letters Patent No. 527,742, issued to me October 16, 1894, and bearing the same title. My present invention may be considered an improvement on the construction set forth in said patent; and to this end the invention consists of the features hereinafter described and claimed, all of which will be fully understood by reference to the accompanying drawings, in which is illustrated an embodiment thereof.

In the drawings, Figure 1 is a fragmentary view of a clarinet provided with my improvements. This is a top view of the instrument—that is to say, it presents the side uppermost when the instrument is held in position for use. Fig. 2 shows the instrument when given a quarter-turn from the position illustrated in Fig. 1, a number of the keys being shown in section. Fig. 3 is a fragmentary view of the instrument seen from the side opposite that in Fig. 2, the parts being shown on a larger scale. Fig. 4 is a section taken on the line *xx*, Fig. 2, looking toward the right. Fig. 5 is a section taken on the line *yy*, Fig. 3. Figs. 6, 7, 8, 9, and 10 illustrate details of construction, the parts being shown on a larger scale.

By an inspection of the drawings it will be observed that my present improvements consist of new mechanism for operating the covers A, B, C, and D, which control the four

sound-holes located at the uppermost end of the instrument, or that shown farther to the left in the drawings; in providing a small vent-hole in the side of the upper part of the instrument, said hole being normally closed by a cover 30, which is operated by the thumb of the right hand; also, in the addition of one sound-hole at the lower end of the instrument, said hole being controlled by a cover 16. The covers 1 to 15, both inclusive, are operated as explained in my previous patent. These covers are provided with keys having overlapping projections *d d'*, so arranged that these projections act to depress or close all the covers above the key acted upon.

The object of these improvements, as heretofore intimated, is to facilitate the necessary fingering of the keys for the production of certain sounds which are obtained by operating the covers mentioned.

I will now explain the operation of these covers and their advantages. The covers A, B, C, and D are a continuation of my system previously patented and are connected in the same way. Covers C and D are operated by the keys M and N. The key N is fast on a sleeve-section 18, mounted on a shaft or spindle 19. The key M operates two sleeve-sections 20 and 21, also mounted on the shaft 19 and connected by a stirrup 22. The sleeve 18 is located between the sleeves 20 and 21. (See Fig. 6.) Covers C and D are provided with weak springs, which have a tendency to maintain them in the open position in the same manner as the covers 1 to 16.

Rigidly attached to the sleeve 18 is an arm 18^a, which projects over the cover D. The key N has a counterspring which is stronger than that of the cover D and therefore holds the cover shut except when the key N is pressed and the projection 18^a raised, in which case the cover D opens automatically by virtue of its spring. This cover cannot open, however, unless the other covers below or to the right of it are opened, since its sleeve-section is mounted on the same shaft 17 and provided with projections *d d'* in common with the covers 1 to 16. The projection *d* of any sleeve is adapted to overlap the projection *d'* of the adjoining sleeve. Thus when it is necessary to pass to the note which cover D gives when

open or from that note to any other note, such as



it is only necessary to hold the first finger of the left hand on key N and operate the other cover without further attention to cover D. Cover C is operated by pressing the key M, whose sleeve has a projection 21^a, which acts on said cover in the same manner as the key N acts on cover D, as heretofore explained. It will be readily seen that this arrangement, which allows covers C and D to open automatically as required and when required, is a very great advantage over the systems heretofore used in which the cover is a part of the key, and the hole cannot be closed unless the finger releases the key each time it is required to pass to any other notes, thereby rendering passages such as the above extremely difficult when performed rapidly.

The covers A and B are operated by the first finger of the right hand, the mechanism employed being illustrated in Fig. 3. This figure also shows a construction by which cover D can also be operated by the first finger of the left hand.

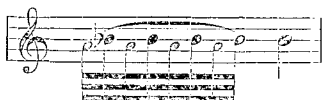
The covers A and B are connected with the other covers by means of the projections *d d'*, as heretofore explained when speaking of the covers C and D. Hence the covers A and B, like all the others, cannot open unless all below are opened or open at the same time. These covers A and B, however, are provided with springs which hold them normally closed. Hence in this they differ from the other covers.

The key *g* is formed integral with an angular arm *g'*, the latter being rigidly attached to a hollow bar *w*, mounted on a suitable shaft *v*. To the opposite end of the bar *w* or the end remote from the key *g* is an arm E. This arm E overlaps an arm F, the latter being rigidly attached to the sleeve of cover B. Hence by pressing on the key *g* the cover B is operated.

The key I is fast on the shaft *v* and overlaps the angular arm *g'* of key *g*. To the extremity of the shaft *v* remote from the key I is made fast an arm E', which overlaps an arm F', made fast to the sleeve of cover A. Thus cover A is operated by key I in the same manner as cover B by key *g*.

Covers A and B are used principally for trills, which are performed in the following manner: Supposing the trill to be between the notes A and B $\flat$,

60



65

the first finger of the left hand holds the key M open and the trill is made by operating

key *g* with the first finger of the right hand. If the trill is to be between the notes A and B $\sharp$,

70



it is done in the same way, except that the first finger of the right hand trills key I instead of key *g*, since the latter key operates both covers A and B, as key I overlaps the angular arm *g'* of key *g*. Thus the trill is a whole tone instead of a half-tone. If the trill is to be

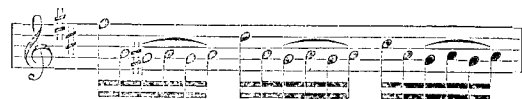
85



and the key N is held down, opening the cover D, which gives the note A $\flat$, then trill with key *g*, which opens cover B and also cover C, since the sleeves of the covers are connected by the projections *d d'*, as heretofore explained. Hence I have the whole-tone trill. This arrangement gives perfect trills, as can be easily understood. In other systems these trills are very imperfect and sometimes impossible from the construction of the instrument.

I will now explain how key K operates cover D when it is necessary it should be operated by the right instead of the left hand. The key K is fast on a shaft *q*, to which is also made fast an arm *z*, overlapping an arm *s*, the latter being also overlapped by the projection 18^a on the sleeve of the cam D. Now when the key K is pressed the arm *z* engages the arm *s* and raises the arm 18^a of the key N, allowing the cam D to open.

I have thus shown that cover D can be operated from either side—that is to say, by key N or by key K and by the right or left hand, as the passage in music may require. The advantage of this is that it facilitates passages of this kind



which are performed by holding the cover D open by pressing on key K with the first finger of the right hand. This will give the note G $\sharp$, (this finger need not move,) while the first finger of the left hand performs the trill by raising and depressing the key M. By this contrivance the above passage is very easily performed, while with instruments heretofore used such passages are extremely difficult or almost impossible.

I will now describe the mechanism for operating the cover 30, controlling the small hole mentioned in the statement of invention.

The key 23 (see Fig. 2) is adapted to be operated by the thumb of the right hand

when the instrument is held in position for use. This key is fast to a shaft 24, to which is also made fast an arm 25, which overlaps an arm 26, fast on a shaft 27, carrying the cover 30. This cover has a spring which normally holds it shut, but when it is required the thumb presses key 23 and opens the cover by virtue of the connection just explained.

The shaft 27 is connected with a separate shaft 28 by means of an arm 28^a, fast on the shaft 28 and overlapping a similar arm 27^a, fast on the shaft 27. Hence the pressure on the key 23 also opens a cover 29, fast on the shaft 28, when said cover is not already open. This construction is useful in passages like the following:



20

which require that both covers 29 and 30 be open at the same time, but the greatest advantages of this mechanism will be evident when it is remembered that the opening of the vent-cover 30 will obviate the necessity for what is called "fork-fingering" in the upper register of the instrument, the awkwardness of which is described in my former patent. In my previous patent a double cover was shown to accomplish this end, but it necessitates the movement of the first finger of the right hand, which at times interferes with the general fingering.

The movement of the thumb by my present construction does not interfere with the movement of the fingers and in some passages is a very great advantage.

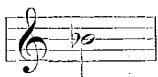
My present construction also includes an extra cover, (designated by the numeral 16.) This cover, with its corresponding sound-hole, gives a half-tone more compass by descending to E_b

45



and a better B₇,

50



and makes the instrument capable of producing the following passages

60



springs, the stems of the covers being made fast to sleeves mounted on a suitable shaft, said sleeves being also provided with projections F' and F respectively, a shaft *v* suitably mounted on the tube of the instrument and carrying a fast projection E' overlapping projection F', a key I made fast to the shaft *v*, a sleeve *w* movably mounted on the shaft *v* and carrying a fast projection E overlapping the projection F, and a key *g* having an arm *g'* fast on the sleeve *w*, the key I overlapping the arm *g'* as and for the purpose set forth.

3. In an instrument of the class described, the combination of the covers C and D controlling sound-holes in the tube of the instrument, and provided with springs which have a tendency to hold the covers open, and the keys N and M made fast to sleeves suitably mounted on the tube of the instrument, said sleeves carrying projections overlapping the covers C and D, the keys M and N being provided with springs stronger than the springs of the covers C and D as and for the purpose set forth.

4. In an instrument of the class described, the combination with the tube having sound-holes controlled by covers whose keys are so connected as to close all the covers above the key acted on, of a shaft 27 suitably mounted thereon and provided with a stem carrying a cover 30 controlling a vent-hole in the tube, said cover being normally held closed by a suitable spring, the shaft 27 being also provided with an arm 26, and a shaft 24 provided with a key 23 and an arm 25, the latter overlapping the arm 26 whereby, as the key 23 is pressed, the cover 30 is opened, as and for the purpose set forth.

5. In an instrument of the class described, the combination with the tube having sound-holes controlled by covers whose keys are so connected as to close all the covers above the key acted on, of a shaft 27 suitably mounted thereon and provided with a stem carrying a cover 30 controlling a vent-hole in the tube, said cover being normally held closed by a suitable spring, the shaft 27 being also provided with an arm 26, a shaft 24 provided with a key 23 and an arm 25, the latter over-

lapping the arm 26, and a sleeve 28 having a projection overlapping a projection on the shaft 27, the sleeve 28 being provided with a cover 29 adapted to control a hole in the tube of the instrument whereby, as the key 23 is pressed, the covers 29 and 30 are both opened, as and for the purpose set forth.

6. In an instrument of the class described, the combination with the tube having sound-holes controlled by covers whose keys are so connected as to close all the covers above the key acted on, of the cover 16 controlling a sound-hole in the tube of the instrument, said hole being located near the extremity of the tube remote from the mouthpiece, the said cover being connected with the next cover by the overlapping projections *d d'*, the cover being connected with a sleeve mounted on a shaft carried by the tube, a shaft 34 having a key 31 made fast thereon, said shaft being provided with a projection 35, the sleeve of the cover 30 having a projection which overlaps the projection 35, whereby, as the key 31 is pressed, the cover 16 is operated, as and for the purpose set forth.

7. In an instrument of the class described, the combination with the tube having sound-holes controlled by covers whose keys are so connected as to close all the covers above the key acted on, of the cover 16 controlling a sound-hole in the tube of the instrument, said hole being located near the extremity of the tube remote from the mouthpiece, said cover being connected with the next cover by the overlapping projections *d d'*, the cover 16 being connected with a sleeve mounted on a shaft carried by the tube, a shaft 34 having a projection 41 made fast thereon, a sleeve 39 mounted on a suitable shaft and carrying a key 38, said key also carrying a projection overlapping the projection 41 on the shaft 34, whereby, as the key 38 is pressed, the cover 16 is operated, as and for the purpose set forth.

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

PHILIP J. DEVAULT.

Attest:

WILLIAM R. MCCREA,
WILL H. SPURGEON.