FOOT-OPERABLE ATTACHMENT FOR VALVED WIND INSTRUMENTS

Filed July 6, 1943

INVENTOR

By Philip P. Friedell
ATTORNEY
FOOT-OPERABLE ATTACHMENT FOR VALVED WIND INSTRUMENTS

Wiley H. Strane, Oakland, Calif.

Application July 6, 1943, Serial No. 493,659

8 Claims. (Cl. 84—388)

This invention, a foot-operated attachment for wind instruments is designed specifically for valve-controlled instruments, such as cornets, trumpets, key trombones, altos, basses, and French horns, and as illustrated is applied to a trumpet. This invention makes possible the playing of such instruments by those who have lost the use of their hands for operating the valves for playing the instruments, with operation being conducted by the feet of the player.

As is well known, there are many who would greatly enjoy being able to play such instruments if it was not for the handicap of being unable to operate the valves, and this attachment makes it possible for a group of such handicapped persons to actually form a band or orchestra, and those who are not physically handicapped can easily play two instruments at a time, as one of the valve instruments such as a trumpet by their feet and a guitar, banjo or even a piano by hand.

The objects and advantages of the invention are as follows:

First, to provide a foot-operable attachment for valved wind instruments by which the valves can be manipulated by the feet of the player.

Second, to provide an attachment as outlined which is simple in construction and operation and with which a wind instrument can be played by persons who have lost the use of their hands.

Third, to provide an attachment as outlined with supporting means for the instrument so that anyone desiring to and having no hands or not having the use of either hand will be able to play the instrument supported.

Other objects and advantages of the invention will become apparent as the following description is read on the drawing forming a part of this specification, and in which:

Fig. 1 is a side sectional elevation through the invention and conforming to a line 1—1 of Figs. 2 and 3.

Fig. 2 is a section taken on line 2—2 of Fig. 1 and shows the treadle arrangement for a wind instrument with three valves.

Fig. 3 is a section taken on line 3—3 of Fig. 1 showing one type of pulley arrangement for the operative connection between the valves and the foot treadles.

Fig. 4 is an enlarged view of one of the valves shown partly in section to illustrate the attachment of the operative connection to the valve.

Fig. 5 is an enlarged fragmentary front elevation of a modified form of operative connection applied to the valves of cornets and similar instruments, and particularly suited for French horns as indicated by the dotted extension.

The support or stand is attractively designed and includes a back wall 10, side walls 11, a base 12, and a head 13 to support the instrument 14, with the height such as to locate the mouthpiece 15 at proper and convenient height, the instrument being attached to the head by suitable securing means, such as the clamp 16. Suitable adjusting means is provided for varying the relative elevation of the mouthpiece 15 and is illustrated in its simplest form as comprising screws 17 adjustable through the base 12 as indicated in Figs. 1 and 2 and being only one of the many ways in which this adjustment can be provided for. As is perfectly clear, by advancing the screws in the front of the base, the front of the frame is raised and tilted backward, thus elevating the mouthpiece, while those in the rear will tilt the frame forward and thus swing the mouthpiece to a lower level.

The valve of a wind instrument consists of a cylinder 18 having a cap at each end, respectively 19 and 20, a plunger 21 with the conventional bypasses not shown because they are well known in the art, a valve rod 22 attached to the plunger and operating through a passage in the cap 19 and having a valve button 23 mounted thereon. The types of instruments previously mentioned have three of these valves and consequently three buttons 23, 24 and 25, and a compression spring 26 is located between the bottom of the plunger and the cap 20 to normally keep the plunger in its uppermost position. Suitable air relief passages 27 and 28 are formed through the bottom of the plunger and the cap 20, and in the event that they are not existent in the instrument, they are formed for the specific purpose to which they are adapted for this invention.

Foot pedals 29, 30 and 31 are provided, one for each valve, and are hinged at 32 and are made of suitable width so that they can be depressed individually and are sufficiently closely spaced so that two pedals can be depressed simultaneously with one foot, because in playing such instruments it will be necessary to operate the valves separately, any two, or all three at a time.

Each pedal has means for normally retaining it in a raised position, and means for limiting raising and depressive movements, and is shown as consisting of an ear 33 on each pedal, a socket 34 mounted on the base 12 and having an axial passage 35 and a diametric slot 36, a plunger 37 having one end pivoted in the ear 33 at 38, and a compression spring 39 between the ear 33 and
the top of the socket 34, with a pin 40 passing through the other end of the plunger 37 and operating in the slot 36. Thus the spring 39 urges the pedal to its upper-most position while the pin 40 limits the upward movement, and also limits the downward movement when the pedal is depressed. The socket 34 is preferably formed of live rubber, under which conditions operation of the pedals will be noiseless. A heel plate 41 is provided as a rest and positioning means for the player's feet.

The operative connection between the valves and the pedals is illustrated as consisting of flexible elements such as wires or cords 42, 43 and 44 which pass about sheaves mounted in any suitable arrangement and form connections between the respective pedals and the respective valves, with one end of each cord attached to the respective pedals as indicated at 45 and the other end attached to the respective plungers as indicated at 46 through a link 47 which is secured through the passage 27 in the bottom of the plunger and with the cord passing through the hole 28 in the bottom cap.

The sheave arrangement is shown in its simplest form, in which the grooves of the respective sheaves 48, 49 and 60 are in axial alignment with the plungers of the respective valves with the central sheave 49 in line with the axis of the instrument and the other sheaves 48 and 59 being oppositely angled to lead the respective cords over the respective sheaves 51, 52 and 63 the grooves of which are in vertical alignment with the points of connection 45 on the respective pedals, with the cord 42 passing about the sheaves 48 and 52 to pedal 29, cord 43 passing about sheaves 49 and 51 to pedal 30, and cord 44 passing about sheaves 50 and 63 to pedal 31, to place the pedals in the same sequence as the valves.

Obviously other types of operative connections could be substituted, however, the one shown is preferred because of its quiet operation in comparison to any type of gear, link or lever mechanism which might be substituted.

The modification illustrated in Fig. 5 is shown in lines as applied to the same type of instrument illustrated in Fig. 1, with extensions shown in dotted lines to illustrate how easily it is adapted to French horns and similar lever operated instruments. The arrangement is the same as previously described with the exception that instead of attaching the cord directly to the plunger, it is instead fastened at 54 to a lever 55 which is pivoted at one end at 56 to the head of the support, with the other end 57 resting on the valve button 23. A spring 58 raises the lever to its normal position with the upward movement limited by a link 60 which is hinged in the lever at 65 and passes through a hole 61 in a cross member 62, with the end of the link bent over as indicated at 63 to form a stop.

To adapt this arrangement for French horns, the lever 55 is extended as indicated by the dotted extension 64 to operate the valve lever 65 on the instrument.

Irrespective of the arrangement used, the instrument is played by depressing the respective pedals, which, as will be noted, agree in sequence with the valves.

Since the hands are not required for operating the valves, another type of instrument, such as a mandolin, guitar, banjo, or even a piano can be played at the same time by the same person, if, in the case of a piano the invention is made to fit about the piano in some manner similar to the arrangement disclosed in my Patent Number 2,541,790, issued May 13, 1941, but with the several valves, the several pedals, and a single operative connection for each valve instead of the double operative connection shown in that patent.

It will be understood that variations in construction and arrangement of parts, which variations are consistent with the appended claims may be resorted to without detracting from the spirit or scope of the invention or sacrificing any of the advantages thereof.

I claim:

1. An attachment comprising; a frame having a base and an upright portion integral therewith and means for securing a musical wind instrument having three valves and operating means therefor and a mouthpiece at the upper end of said upright portion; a series of three pedals mounted at one of their ends on a common pivot supported on said base and in parallel with the sides of the pedals in close relation for individual or simultaneous operation by either foot of an operator, and lifting means associated with said base and each pedal for urging the respective pedals to a raised position and including stop means for limiting the raising and depressing movements of each pedal; a series of sheaves mounted in said upright portion for each valve; and three flexible elements respectively having one end connected to the respective pedals, operating about the respective series of sheaves, and having the other end connectable to the respective operating means for the valves.

2. A structure as defined in claim 1; adjusting means comprising threaded members manually adjustable respectively in the front end and the rear end of said base for tilting said frame forward or backward at will to adjust the relative height of the mouthpiece of the instrument.

3. An attachment comprising; a supporting base and an upright portion integral therewith and means for supporting a three-valve musical wind instrument at the upper end thereof in manual position; a series of three foot pedals having each one end pivotally connected with a common pivot supported on said base and in parallel and in close relation for individual or simultaneous operation at will, and three structural couplings respectively having one end connected to the other ends of the respective pedals, and the other end connectable for operating the respective valves of the instrument, and means cooperating between said base and the respective pedals for urging said pedals to a raised position, and stop means associated with said means cooperating for limiting the raising and depressing movements of the pedals to a degree in conformity with the required movements of the valves.

4. A structure as defined in claim 3; said upright portion consisting of side walls and a front wall extending upwardly from said base to form a concealing cabinet, and having means adjustable in the forward and rearward ends of said base for tilting the attachment to raise or lower the mouthpiece of an instrument mounted at said upper end to convenient manual playing position.

5. A structure as defined in claim 3; said upright portion consisting of side walls and a front wall extending upwardly from said base to form a concealing shield; said structural couplings consisting each of a series of sheaves pivotally
mounted between said side walls and a flexible element operating about said series of sheaves and with one end connected to the other end of the foot pedal, and the other end connectable for operation of one of the valves of a musical instrument mounted at the upper end and between the side walls.

6. A structure as defined in claim 3; three levers each pivotally mounted at one end on said upright portion and with the other end cooperatively associable with the valve operating means of a musical instrument mounted at said upper end, and with the said other end of the respective structural couplings connected to the respective levers, whereby operation of the foot pedals will operate the valves of a musical wind instrument mounted at the upper end of the upright portion.

7. An attachment comprising: a cabinet having a base and a concealing cabinet having side walls and a front wall extending upwardly from said base, and means for securing a three-valve musical wind instrument at the upper end thereof and between said sides; a series of three foot pedals in parallel and in close relation for individual or simultaneous operation and having one end pivotally mounted on said base and means for urging each pedal to a raised position and means included for limiting the degree of raising and depression of said pedals; three angularly related sheaves pivotally mounted between said side walls in spaced relation above the other ends of the respective pedals; three sheaves having their axes parallel and spaced from said angularly related sheaves and with their peripheral grooves alignable with valve operating means for a musical wind instrument mounted at said upper end, and a flexible connection for each pedal and having one end connected to the other end of the pedal and operating about one of the three angularly related sheaves and one of the said three sheaves with the other end associable with the valve operating means of the instrument.

8. A structure as defined in claim 7; the other end associable with the valve operating means consisting of a lever associable with each valve operating means of the instrument and pivotally mounted on one side wall at one end and with the other end urged to a non-associable position and with the other end of the flexible connection connected thereto, whereby depression of a foot pedal will operate a lever to operate a valve of the instrument.

WILEY H. STRANE.