H. C. MARTIN.

VALVED WIND MUSICAL INSTRUMENT.

APPLICATION FILED JUNE 26, 1905.

1,003,931.

Patented Sept. 19, 1911.

6 SHEETS—SHEET 1.

Fig. 1.

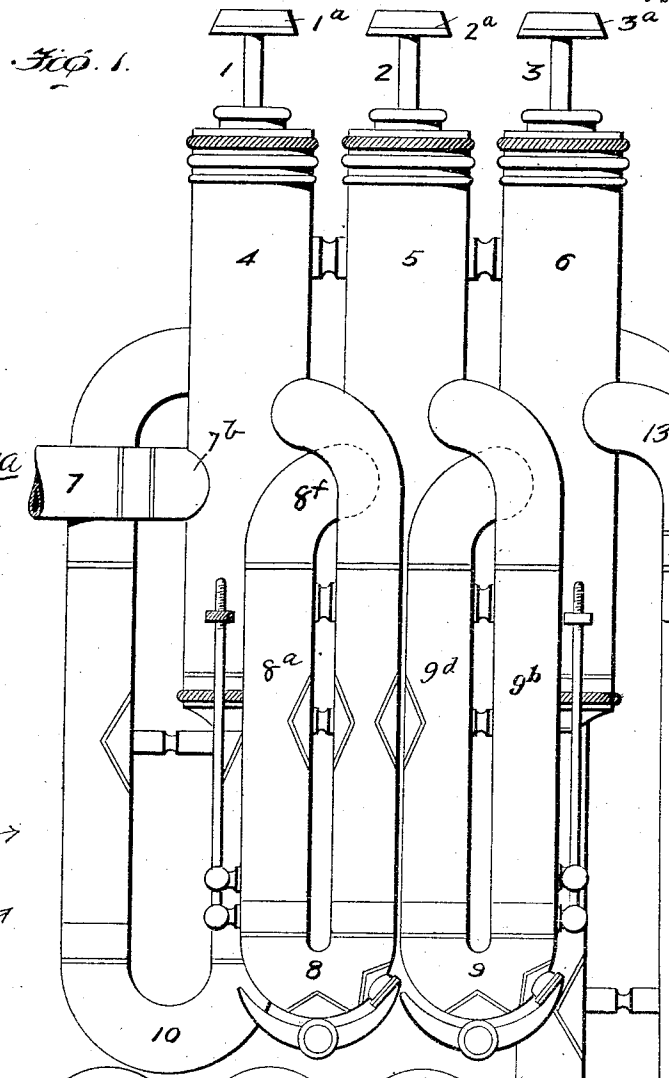


Fig. 1a.

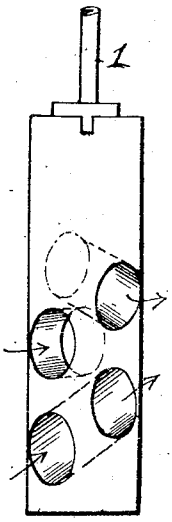
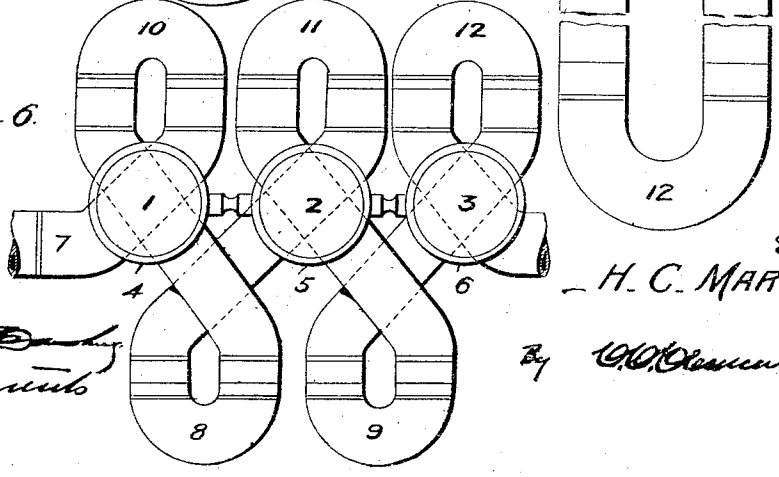


Fig. 6.



Witnesses

H. C. Clements

Inventor

H. C. MARTIN.

By H. C. Clements,

Attorney

H. C. MARTIN.

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6 SHEETS—SHEET 2.

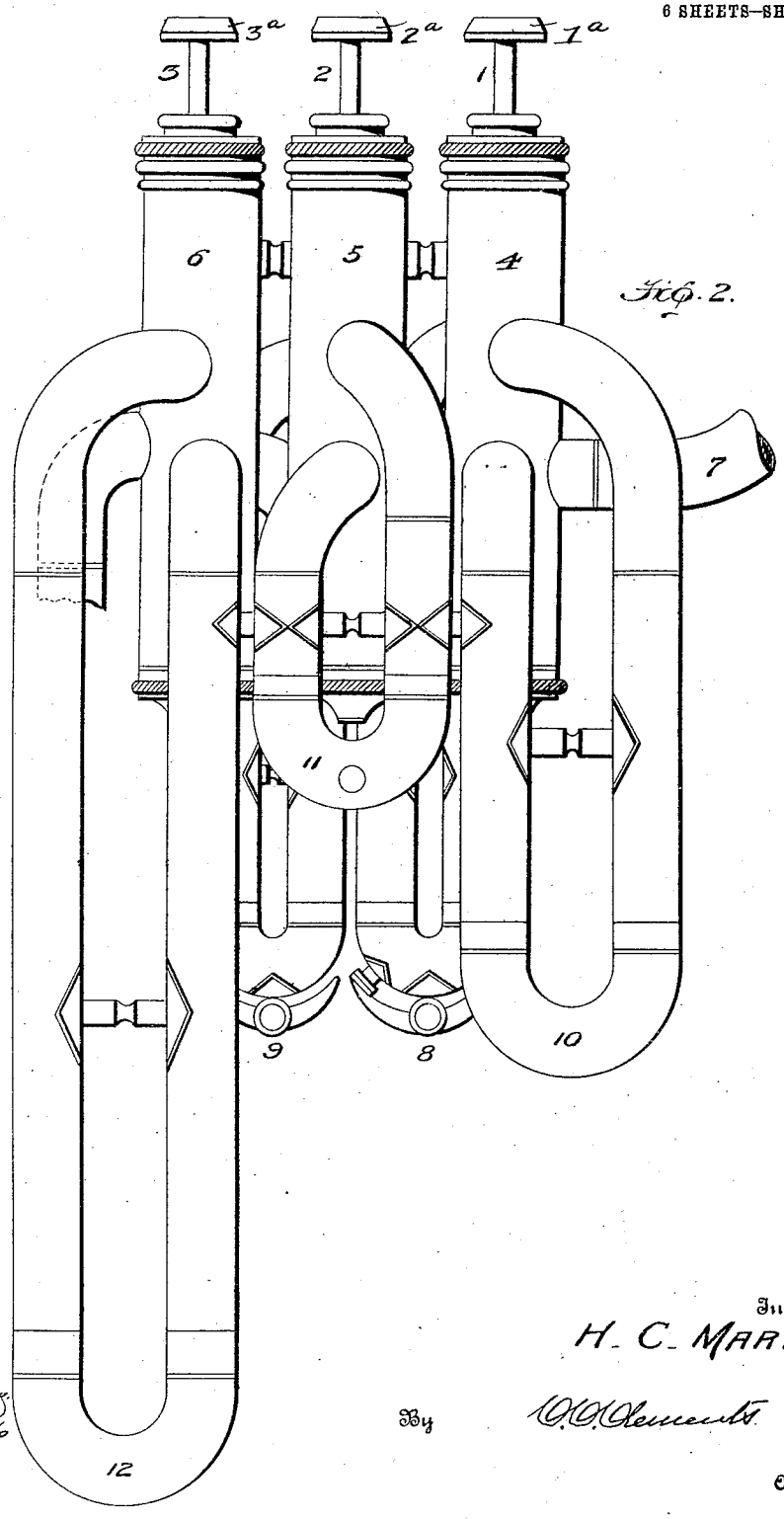

Fig. 2.

Witnesses

E. F. Clements

Inventor

H. C. MARTIN.

By O. O. Clements

Attorney

H. C. MARTIN.

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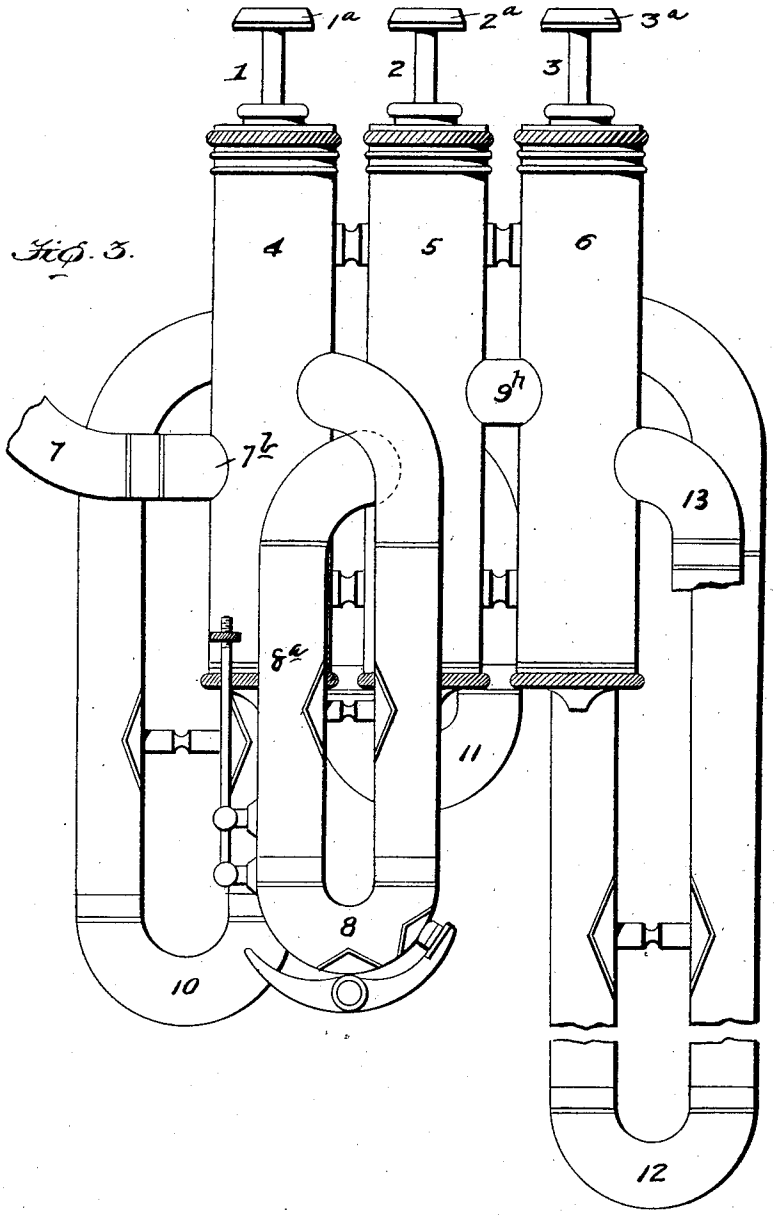
6 SHEETS—SHEET 3.

Fig. 3.



Inventor

H. C. MARTIN

Witnesses

E. L. Clements.

By C. C. Clements,

Attorney

H. C. MARTIN.

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6 SHEETS—SHEET 4.

Fig. 4.

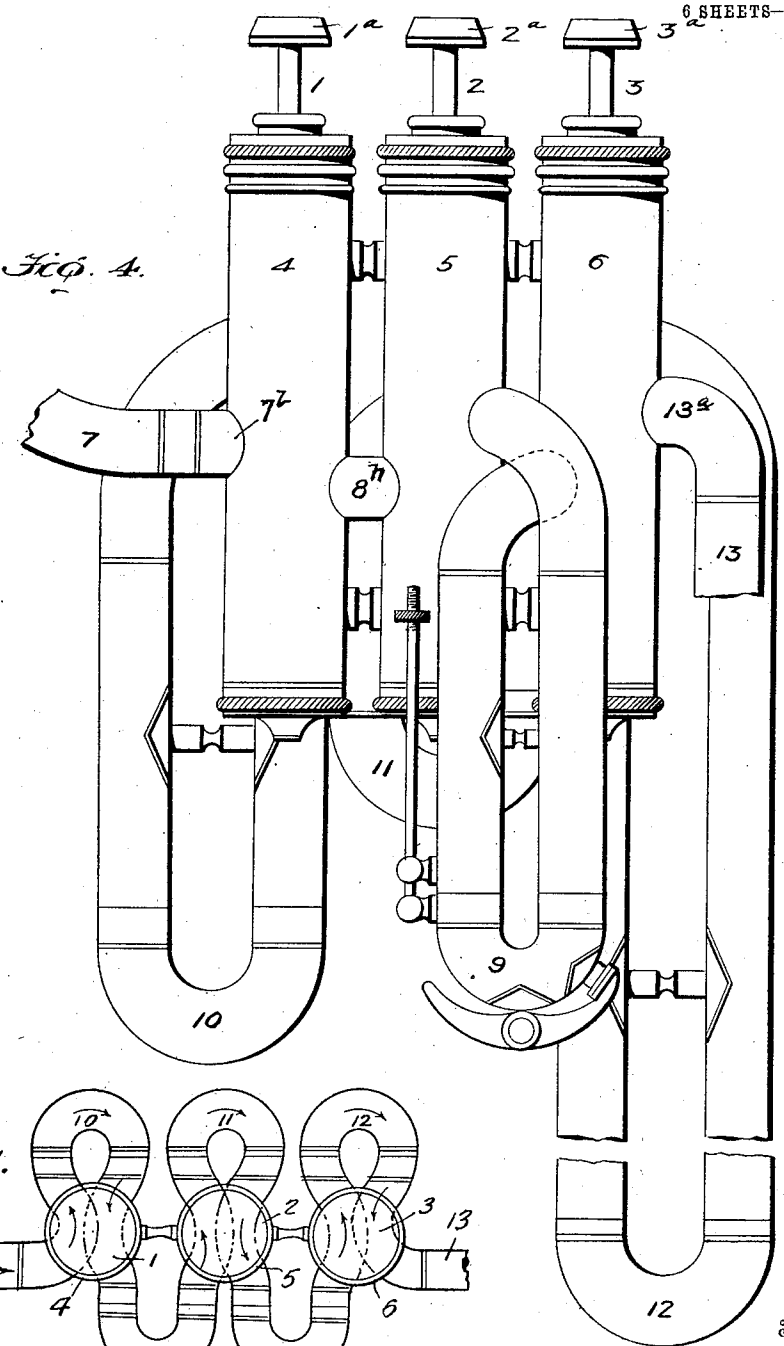

Fig. 7.

Witnesses

T. C. Clemmons

By

Inventor

H. C. MARTIN

O. O. Clemmons.

Attorney

H. C. MARTIN.

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6 SHEETS—SHEET 5.

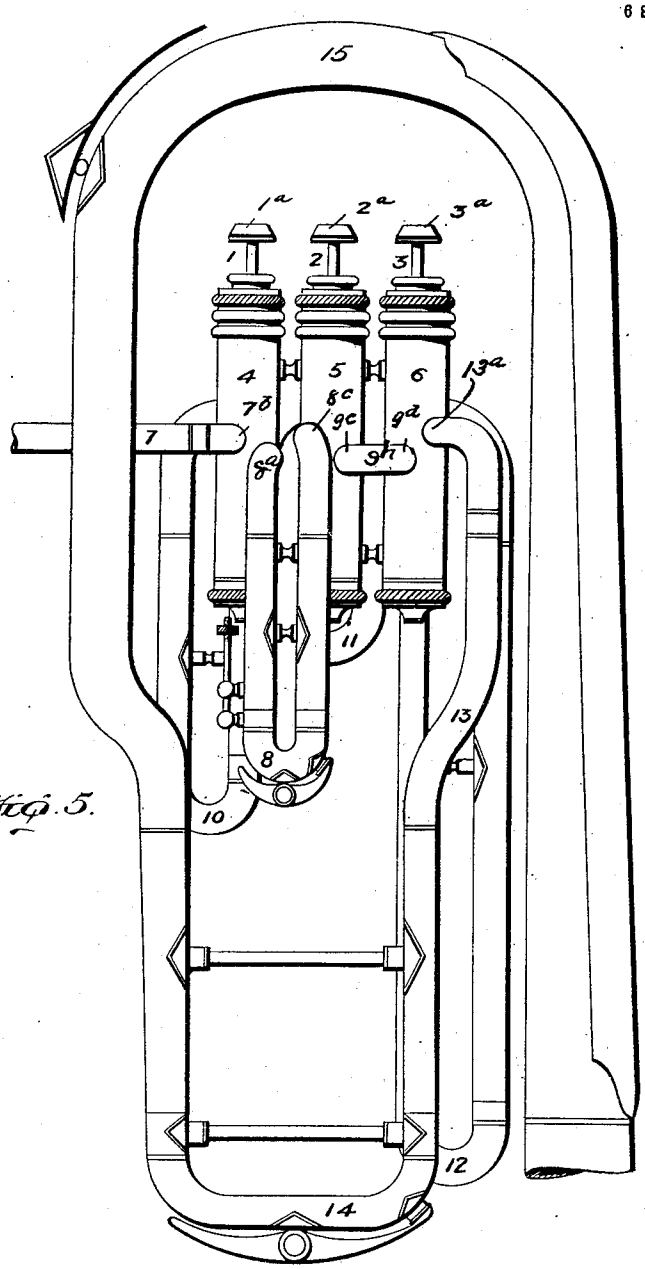


Fig. 5.

Witnesses

G. C. Clements

Inventor

H. C. MARTIN.

By O. C. Clements,

Attorney

H. C. MARTIN.

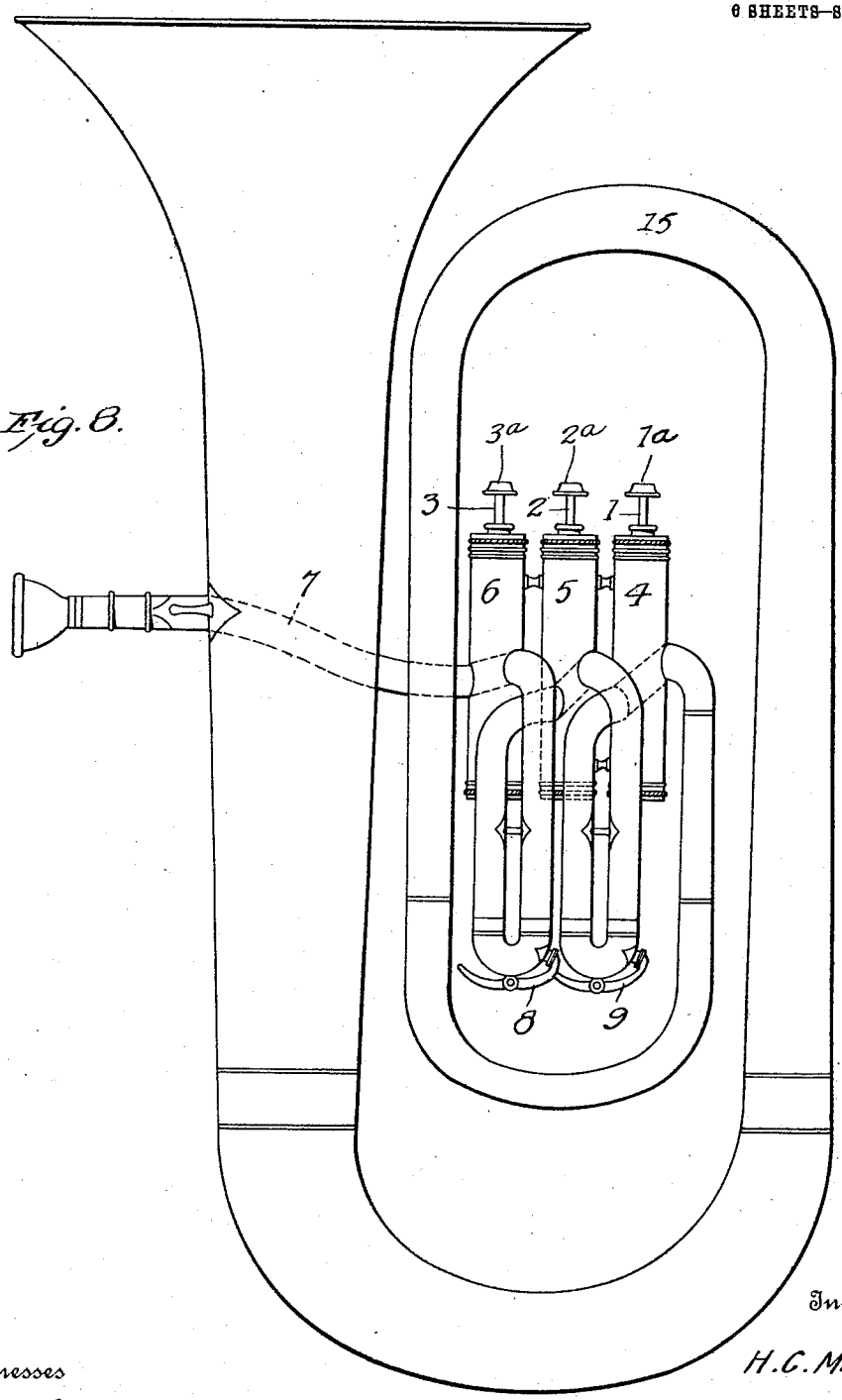
VALVED WIND MUSICAL INSTRUMENT.

APPLICATION FILED JUNE 26, 1905.

1,003,931. **Patented Sept. 19, 1911.**

6 SHEETS—SHEET 6.

Fig. 6.



Witnesses

L. H. Schmidt.

G. C. Clements

Inventor

H. C. MARTIN,

By C. C. Clements.

Attorney

UNITED STATES PATENT OFFICE.

HENRY CHAS. MARTIN, OF ELKHART, INDIANA.

VALVED WIND MUSICAL INSTRUMENT.

1,003,931. Specification of Letters Patent. Patented Sept. 19, 1911.

Application filed June 26, 1905. Serial No. 266,986.

To all whom it may concern:

Be it known that I, HENRY C. MARTIN, a citizen of the United States, residing at Elkhart, in the county of Elkhart and State of Indiana, have invented new and useful Improvements in Valved Wind Musical Instruments, of which the following is a specification.

My invention relates to valved wind musical instruments and has for its objects, among others, to provide means for changing the key or pitch, or the key and pitch of an instrument, by connecting the first and second, the second and third, or the first and second and second and third casings by slides of the required length. These slides are connected opposite the valve slides of the instrument and form part of the main air tube or passage between the valves or cylinders and may be provided with suitable stops to limit their movement to the length required by the performer.

My construction not only provides a means for quickly changing the key or pitch, or the key and pitch of the instrument, but also permits the maker to use a straighter, less obstructed and more uniform air passage through the valves, whether the pistons are up or depressed, and also to use fewer sharp bends or crooks, thereby making a more uniform air passage throughout, thereby causing the tones to vibrate more freely, and the valve tones, that is, the tones that are produced when the pistons are depressed, to vibrate as freely and clearly as the open tones which are produced when the pistons are up. And when desired, one of the key or pitch slides may be used as a tuning slide. I provide a continuous, unbroken, undisturbed taper from the valves to the end of the bell. Manufacturers have long sought to make an instrument that can be changed from one key or pitch to another and have it remain in tune in either key or pitch, but have been unable to do so, for the reason that by substituting a longer slide for, or partly pulling out the tuning slide, which forms part of the main tapered tubing, the taper in this main tapered tube becomes faulty and out of proportion, especially so at the point where the slide is changed, thereby causing the instrument to be out of tune in either one of the keys or pitches. I employ cylindrical tubing between the valves, and by the disposition of the openings in the valves, and the connections I provide a smooth passage for the air.

Other objects and advantages of the invention will hereinafter appear and the novel features thereof will be particularly pointed out in the appended claims.

While my invention has been illustrated as applied to a barytone in the accompanying drawings, it is obvious that it may be used in connection with any other valved wind musical instrument.

In the drawings, forming a part of these specifications:—Figure 1 is a side elevation of a set of barytone valves embodying my invention. Fig. 1ª is a detail of one of the pistons removed from its casing. Fig. 2 is a side elevation of a set of barytone valves opposite to that shown in Fig. 1. Fig. 3 is a side elevation of a modification of a set of barytone valves, showing the first and second valves connected by a key or pitch slide, and the second and third valves connected by a short connecting tube. Fig. 4 is a side elevation of a modification of a set of barytone valves, showing the first and second valves connected by a short connecting tube, and the second and third valves connected by a key or pitch slide. Fig. 5 is a side elevation of a modification of a set of barytone valves, showing the first and second valves connected by a key or pitch slide, the second and third valves connected by a short connecting tube, a short tapered tube connecting the third valve and the tuning slide and the second branch connected to the tuning slide at its opposite end, the mouthpipe broken off and the second branch broken off where it connects with the first branch. Fig. 6 is a partly diagrammatic projection showing the air passage when the pistons are depressed in position for a valve tone. Fig. 7 is a projection at right angles to Fig. 5 similar to Fig. 6 showing the air passage when the pistons are depressed in position for a valve tone. Fig. 8 is an elevation of a complete musical instrument of the form shown in Fig. 2 looking at the opposite side.

Like numerals of reference indicate like parts in the different views.

In all of the views, 4, 5, and 6 are valve casings and are conveniently designated among manufacturers and musicians as the first valve, the second valve and the third valve, so when I employ these terms in the

specifications and in the appened claims, I desire them to convey their conventional meaning and to be understood as referring respectively to the valve nearest the front or mouthpiece end of the instrument, the valve occupying middle position or next nearest the front of the instrument and the valve farthest from the end, or nearest the main tapered tubing which connects the three valves to the bell. The pistons, 1, 2 and 3 are mounted to be reciprocated in the valve casings 4, 5 and 6, each provided at its upper end with a finger tip 1^a, 2^a, 3^a by means of which they may be depressed.

7 is a pipe straight all of the way from the mouthpiece connected to the first valve which carries the air from the mouthpiece to the first valve. In Fig. 1, as well as in Figs. 3, 4 and 5, the air passes through the mouthpiece 7.

8 and 9 are slides or U-shaped bends connecting the valve casings 4, and 5, and 5 and 6, these slides to be used as key, pitch or tuning slides and forming part of the main air passage and being used to lower or raise the key or pitch of the instrument.

10, 11 and 12 are the valve slides, which, when the pistons are depressed, allow the air to pass through them and add length to the instrument in order to produce the valve tones.

13 is a part of the main tapered tubing connecting the third valve with the tuning slide 14, which forms part of the main tapered tube.

15 is what is known as the second branch, broken off where it joins the first branch or bow.

In Fig. 1 the air passes through the mouthpiece 7 to the first valve casing 4, thence by connection 8^a and the key or pitch slide 8 and L-shaped connection 8^f to the second valve casing 5 by connection 9^b, the key or pitch slide 9 and connection 9^d to the third valve casing 6, and by connection 13^a into the main tapered tube 13. This figure also shows a connection to and from each valve casing. These slides may be placed on the opposite side of the valve casings by exchanging positions with the valve slides, and retain the same air passage.

In Figs. 6 and 7 are shown views of the valves of Figs. 1 and 5. In these views the pitch and valve slides are foreshortened and all made to represent the same length, also to appear as connected to the valve casings on a plane surface or horizontally, but this is for the purpose of better illustrating the improvement in the air passage through the valves and slides when the pistons are depressed or when the pistons are in their normal position. In the views the mouthpiece and main tapered tubing are shown as broken off; the mouthpiece connects to the first valve and the main tapered tubing to the third. Fig. 6 is a view of the valves of Fig. 1, showing the air passage, when the pistons are depressed in position for a valve-tone. In this view, the two upper passages or ports through the pistons extend at right angles to each other, one just below the other, thus forming a direct, clear and uniform passage through the valves, not requiring the use of sharp bends or crooks in the passages that lead to and from the valves, such as required in the construction of the ordinary valve. In this view, mouthpiece 7, conducts the air to the first valve casing 4, thence through said valve casing 4, into and through the valve slide 10, thence through valve casing 4, into and through the key or pitch slide 8, to the second valve casing 5, thence through said valve casing 5, into and through the valve slide 11, thence through valve casing 5, into and through key or pitch slide 9, to the third valve casing 6; thence through said valve casing 6, into and through the valve slide 12, thence through valve casing 6, into the main tapered tubing. Fig. 7 is a view of the valves of Fig. 5, showing the air passage when the pistons are up, or in their normal position. In this view it is shown there are no sharp crooks or bends in the air passage. In this figure, the mouthpiece 7 conducts the air to the first valve casing 4, thence through said valve into and through the key or pitch slide 8 to the second valve casing 5, thence through said valve casing 5, into and through the key or pitch slide 9, to valve casing 6, into and through said valve casing 6, to the main tapered tubing.

In Fig. 3, the mouthpiece 7 allows the air to pass to the first valve casing 4, thence by a key or pitch slide to the second valve casing 5, thence by a connection 9^h to the third valve casing 6, and thence into the main tapered tubing 13. This slide may be changed to the opposite side of the valve casings by changing positions with the first and second valve slides.

In Fig. 4, the mouthpiece 7, allows the air to pass to the first valve casing 4, thence by a connection 8^h to the second valve casing 5, and thence by a key or pitch slide 9, to the third valve casing 6, and thence into the main tapered tubing 13. This slide may be changed to the opposite side of the valve casings by changing position with the second and third valve slides.

In Fig. 5, the mouthpipe 7 allows the air to pass to the first valve casing 4, and thence by a connection 8^a and a key or pitch slide 8, and L-shaped connection 8^e, to the second valve 5, thence by a U-shaped connection 9^h, to the third valve casing 6, and thence into the main tapered tube 13. In this drawing, the air passage is somewhat different from that shown on Figs. 1, 2, 3 and 4. The opening 7^b from the mouthpipe 7 into the casing

4 is at a point higher than the exit from said casing into the L-shaped connection 8^a. The point of connection 8^c of said L-shaped connection with the casing 5 is higher while the connections 9^c and 9^d are lower and straight across. The connection 13^a is above the connections 9^c and 9^d and substantially in line with the connections 7^b and 8^c. The second and third valve casings may also be connected by a slide, or all three valve casings may be connected by U-shaped crooks or bends and still retain the improved air passage shown in Fig. 7. The positions of these key or pitch slides may be changed to the opposite side of the valves by the same method as demonstrated in the other drawings. The U-shaped bends used for connecting the valve casings, while illustrated as almost straight may be of any desired shape or bend to suit the maker. While I have described only the open passage, the air passage, when the pistons are depressed, will be shown and described in connection with Figs. 6 and 7.

Fig. 7 is a view of the valves of Fig. 5, showing the air passage when the pistons are depressed. This view is the same as the view in Fig. 6, with the exception that the two upper air passages or ports through the pistons are parallel with each other, only one being a trifle lower, and the tubing, forming the bends and slides, does not cross at any point through the valves or in the air passage. By these drawings it will also be seen that the maker is allowed to do away with the sharp bends, turns and crooks to and from the valve casings and through the pistons, thereby allowing him to have a more perfect system of curves and bends and straighter passage through the pistons, thus making an instrument that has a clear and even tone whether the pistons are up or depressed and one that is perfectly free blowing.

In the above illustrations, the key and pitch slides are provided with water keys. The water or saliva which gathers in an instrument when in use, will accumulate in them, thereby preventing its accumulation in the valve slides, which are not provided with keys or valves to allow it to escape and which is objectionable.

By following the course of the arrows in Figs. 6 and 7, it will be seen that all connections between the valve casings are connected from the first to the second and from the second to the third valve casing, thus causing the use of less straight tubing and more tapered tubing than can be employed in any other style of instrument, having a slide attachment. While the drawings show one part of the main tapered tubing and mouthpipe, it should be understood that they are the same as used in all barytones, with the exception of the part performed by the tuning slide. This tuning slide can be omitted, using one of the key or pitch slides as a tuning slide, thereby making one continuous, unbroken taper from the third valve to the bell.

It will be noted from the above that all the key and pitch changing slides are disposed between the valves, so that when any change is made in either key or pitch the taper is not disturbed. By this means I maintain the taper-tubing, continuous, and I am enabled to produce any intermediate tones desired. I also obviate the necessity of employing any delicate push rods, levers, etc., for regulating the length of the valve slides to keep the instrument in tune. By simply regulating the one slide, the key or pitch is changed without having to touch any other slide and still keep the instrument in tune.

The upper ports or passages through all three pistons, in Figs. 1, 2, 3, 4, 6 and 7, are of the same length and of the same incline through the piston, which is also true of the middle and lower passages through the pistons. The pin, soldered to each piston which works up and down with the piston in a slot made in the outer casing containing the pistons, or rather in a groove in the outer casing, keeps the piston from turning in the casing when the same is depressed or allowed to spring back into position so that the passages or ports through the pistons will correspond or match with the tubes soldered to the outer casings and leading thereto. Were it not for these pins the pistons would be interchangeable.

Referring to the drawings, it will be noted that the air from the time it leaves the lips of the performer (of course applied to the mouthpiece not shown, but leading to the member 7, see Fig. 1, which member is straight all the way to the mouthpiece), has a forward movement until it goes out of the bell and does not turn toward the player while passing through the valves.

What I claim as new is:

1. A cornet having unalterable continuously tapered tubing between the bell and the adjacent valve casing, the portions of the main tubing between the valve casings being cylindrical, each of said portions having a slide forming a part of the main air passage, and pistons each having three passages, all of the pistons being of the same size and bored substantially alike, the upper passages through all of the pistons being of the same length and at the same incline relatively to the longitudinal axis of the pistons.

2. A cornet having unalterable continuously tapered tubing between the bell and the adjacent valve casing, the portions of the main tubing between the valve casings being cylindrical, each of said portions having a slide forming a part of the main air

passages, and pistons each having three passages, all of the pistons being of the same size and bored substantially alike, the upper passages through all of the pistons being of the same length and at the same incline relatively to the longitudinal center of the pistons, the inlet and outlet portions of the tubing and of the valve slides occupying like positions respectively on the several casings.

3. A cornet having unalterable continuously tapered tubing between the bell and the adjacent valve-casing, the portions of the main tubing between the valves being cylindrical, slides located in said cylindrical portions between the valve casings, the tubing from the mouth piece to the adjacent valve casing being free from any slide, all of the key and pitch changing slides being disposed between the valve casings, the construction being such that the direction of movement of air is at no time toward the performer during its passage through the valves, regardless of the position of the latter.

4. A cornet having unalterable continuously tapered tubing between the bell and the adjacent valve casing, the portions of the main tubing between the valves being cylindrical, slides located in said cylindrical portions between the valve casings, the tubing from the mouth piece to the adjacent valve casing being free from any slide, all of the key and pitch changing slides being disposed between the valve casings, the construction being such that the direction of movement of air is at no time toward the performer during its passage through the valves, regardless of the position of the latter, and means for withdrawing the water without entirely withdrawing the slides.

5. A cornet having unalterable continuously tapered tubing between the bell and the valve casing nearest thereto, the portions of the main tubing between the casings being cylindrical, a slide located in said cylindrical portion between the casings, the tubing from the mouth piece to the valve being slideless, the construction being such that the direction of movement of the air during its passage through the valves is at no time toward the performer.

6. A cornet having unalterable continuously taperd tubing between the bell and the valve casing nearest thereto, the portions of the main tubing between the valve casings being cylindrical, a slide located in said cylindrical portion between the casings, the tubing from the mouth piece to the valves being slideless, the construction being such that the passage of the air through the valves is at no time toward the performer, and means for withdrawing the water from the slides without entirely withdrawing the latter.

7. A cornet having piston valves and continuously tapered tubing between the bell and the valve casing nearest thereto, the portions of the main tubing between the valve casings being cylindrical, a slide between and connecting the casings and forming a part of the main air passage in the cylindrical tubing, the construction being such that the direction of movement of the air during its passage through the valves is at no time toward the performer, the drawing out of the slide to lower the key or pitch of the instrument neither affecting the tone nor destroying the taper of the tubing.

8. A cornet having continuously tapered tubing between the bell and the valve casing nearest thereto, with an air passage and pistons constructed so that the direction of movement of air is at no time toward the performer during its passage through the valves, regardless of the position of the latter, the upper passages through all of the pistons being of equal length through all of the pistons and slides between said casings.

9. A cornet having continuously tapered tubing between the bell and the valve casing nearest thereto, with an air passage and pistons constructed so that the direction of movement of air is at no time toward the performer during its passage through the valves, regardless of the position of the latter, and slides between the casings, the construction being such that the direction of movement of the pistons is at no time toward the performer.

10. A cornet having continuously tapered tubing between the bell and the valve casing nearest thereto, pistons of equal size and bored substantially alike, the portions of the main tubing between the casings being cylindrical, a slide disposed between the casings to form a part of the air passage, the construction being such that the direction of movement of the air is at no time toward the performer during its passage through the pistons.

11. A cornet having continuously tapered tubing between the bell and the valve casing nearest thereto, the portions of the main tubing between the valves being cylindrical, valves, and key and pitch-changing slides, the slides being disposed between the valves and in said cylindrical portions of the tubing, the construction being such that the direction of movement of the air is at no time toward the performer during its passage through the valves.

12. A cornet having continuously tapered tubing between the bell and the valve casing nearest thereto, the portions of the main tubing between the valves being cylindrical, slides disposed between the valves in said cylindrical portions and forming a part of the main air passage therethrough, said tapered portion being unbroken by slides or

valves, the construction being such that the direction of movement of the air during its passage through the valves is always away from the performer.

13. A cornet having continuously tapered tubing between the bell and the valve casing nearest thereto, the portions of the main tubing between the valves being cylindrical, and slides disposed between the casings in said cylindrical portions and forming a part of the main air passage therethrough, said tapered portion being unbroken by slides or valves, the air passage through the construction being such that the direction of movement of the air at its passage through the valves is always away from the performer.

14. A cornet having pistons, all of the pistons being of substantially the same size and bored substantially alike with their corresponding passages of the same length and disposed at the same angle to the axial line through the pistons, and having its tubing and other parts constructed to insure the direction of movement of the air during its passage through the pistons being at no time toward the performer.

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

HENRY CHAS. MARTIN.

Witnesses:
ROBERT J. MARTIN,
RALEIGH MONGER.