

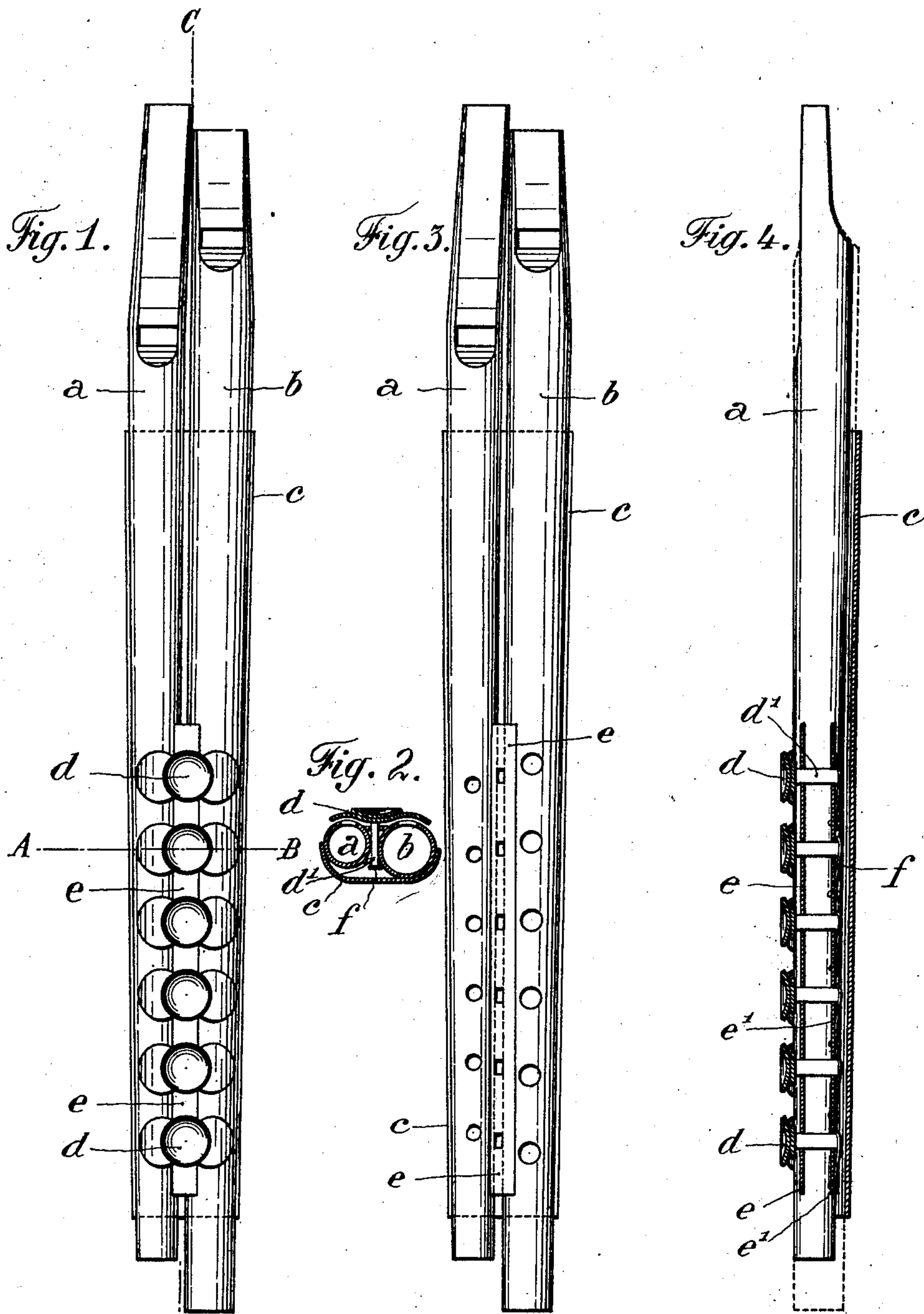
A. KRANTZ.

FLUTE.

APPLICATION FILED JUNE 4, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



WITNESSES:

Harry Schubert.
Conrad Zimmer.

INVENTOR

Adolf Krantz
BY *Loebel & Niles,*
ATTORNEYS.

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2 SHEETS—SHEET 2.

Fig. 5.

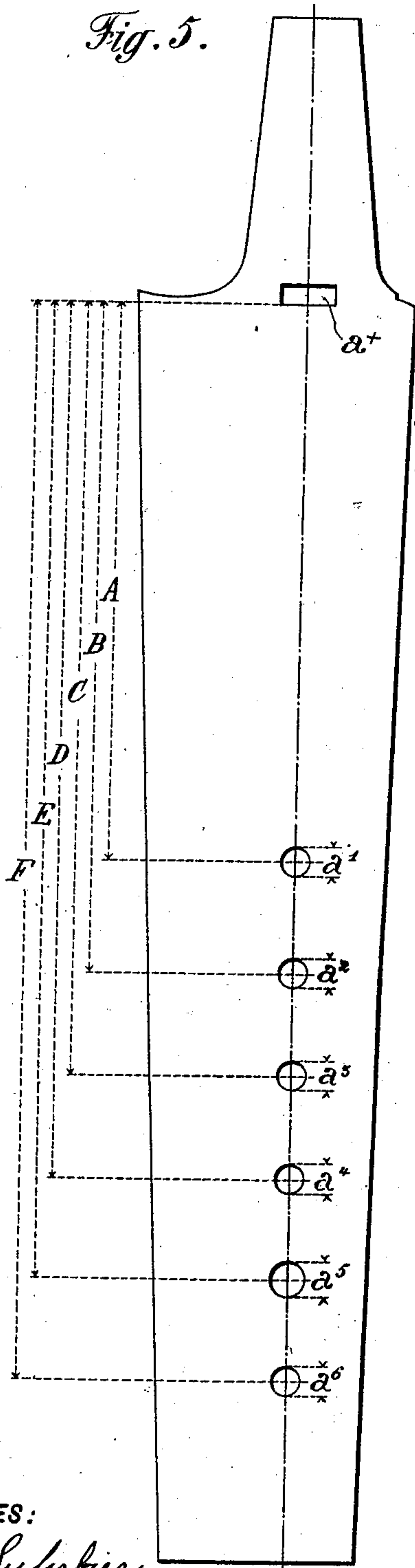
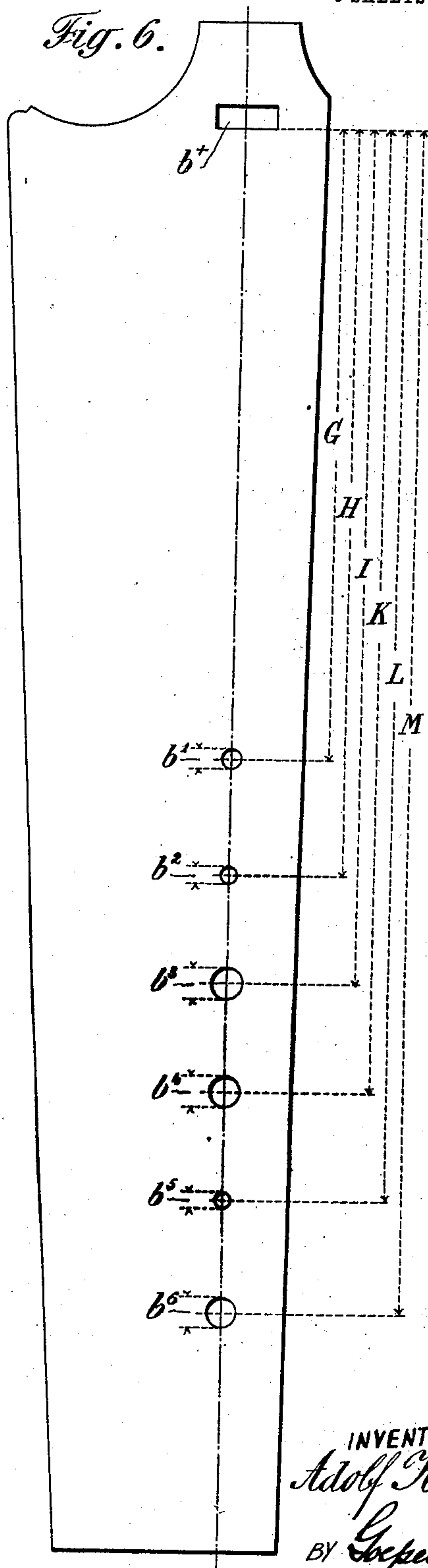


Fig. 6.



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UNITED STATES PATENT OFFICE.

ADOLF KRANTZ, OF GENEVA, SWITZERLAND.

FLUTE.

SPECIFICATION forming part of Letters Patent No. 723,613, dated March 24, 1903.

Application filed June 4, 1902. Serial No. 110,181. (No model.)

To all whom it may concern:

Be it known that I, ADOLF KRANTZ, professor, of Geneva, Switzerland, have invented certain new and useful Improvements in and
5 Relating to Flutes, of which the following is a specification.

The invention consists of certain improvements in and relating to flutes and the purpose of the same is to provide a double flute
10 of such a construction that one and the same person may play alternately either with only one of the two combined flutes or with both of them at a time and to have in the latter case the said two flutes playing with exact
15 consonance.

The accompanying drawings show by way of example one form of construction of the invention.

Figure 1 is a top view of the complete instrument. Fig. 2 is a cross-section on the line A B of Fig. 1. Fig. 3 is a top view of the instrument without its keys. Fig. 4 is a longitudinal section on the line C D of Fig. 1. Fig. 5 is a plane view at natural size of a developed sheet of metal intended to form the flute
20 *a* of one form of construction of the invention. Fig. 6 is a plane view at natural size of a developed sheet of metal intended to form the flute *b* corresponding to the flute *a* shown in
25 Fig. 5.

The improved double flute consists of two tubes *a* and *b*, of metal or other suitable material, which are connected with one another by means of a bridge or band *c*, fixed to both
35 of them by soldering or by any other suitable means whatever. The length of the said tubes or flutes, the diameter of the holes with which the same are provided, and the distance apart between the holes of each tube or flute and
40 their air-hole are so proportioned that those holes of both flutes which correspond to one and the same tune—that is to say, which are intended to be played at a time in exact consonance—are placed approximately in line with
45 each other, so that one double valve or key *d*, fixed to one of the rods *d'*, will be able to cover both such holes at a time, as shown in Fig. 1. The interval between the notes from each pair of holes is a tierce. Each valve or key
50 *d* is provided with a rod *d'*, traversing the two bridges or bands *e* and *e'*, which are fixed by solder or any other suitable means whatever

to the two tubes or flutes *a* and *b*. Each valve or key *d* is further provided with a spring *f*, which is intended to normally hold the said
55 valve open.

The top ends of both flutes are not placed in one line with each other, and this allows the player to alternately engage one or both of them between his lips. The flat springs *f*
60 may be replaced by spiral springs, and the whole construction of the valves and keys may be of any suitable kind whatever. The number of the holes of each flute may also be varied at will.

I prefer to carry out my invention in the manner shown in Figs. 5 and 6, showing one form of construction of two corresponding flutes *a* and *b* which has proved to produce a
65 satisfactory result. The same result would of course be obtained by equally reducing or amplifying the several dimensions of the said flutes *a* and *b*, as represented in Figs. 5 and 6.

In Fig. 5, *a*⁺ is the air-hole, and the distances apart from the said air-hole to the keyholes *a'* *a*² *a*³, &c., are as follows: From *a*⁺ to
75 *a'* the distance A is about three and seven-eighths inches. From *a*⁺ to *a*² the distance B is about four and three-fourths inches. From
80 *a*⁺ to *a*³ the distance C is about five and three-eighths inches. From *a*⁺ to *a*⁴ the distance D is about six and one-sixteenth inches. From *a*⁺ to *a*⁵ the distance E is about six and
85 three-fourths inches. From *a*⁺ to *a*⁶ the distance F is about seven and one-half inches. The said keyholes *a'*, *a*², *a*³, *a*⁴, and *a*⁶ are all of the same diameter—say about three-sixteenths of an inch. The diameter of the hole
90 *a*⁵ is about one-fourth of an inch.

Now to obtain a double flute, realizing the object of the present invention, as explained hereinabove, the just-described flute *a* must be combined with a flute *b*, made according to
95 Fig. 6, in which *b*⁺ is the air-hole. The distances apart from the said air-hole *b*⁺ to the keyholes *b'* *b*², &c., must be the following ones: From *b*⁺ to *b'* the distance G is about
100 four and nine-sixteenths inches. From *b*⁺ to *b*² the distance H is about five and seven-sixteenths inches. From *b*⁺ to *b*³ the distance I is about six and three-sixteenths inches. From *b*⁺ to *b*⁴ the distance K is about seven inches. From *b*⁺ to *b*⁵ the distance L is about

seven and seven-eighths inches. From b^+ to b^6 the distance M is about eight and nine-sixteenths inches. The diameters of the key-holes of the said flute b are as follows: The
 5 diameter of the hole b^1 measures about one-eighth of an inch. The diameter of the hole b^2 measures about one-eighth of an inch. The diameter of the hole b^3 measures about seven
 10 thirty-seconds of an inch. The diameter of the hole b^4 measures about seven thirty-seconds of an inch. The diameter of the hole b^5 measures about one-eighth of an inch. The diameter of the hole b^6 measures about seven
 thirty-seconds of an inch.

15 I do not limit myself to the dimensions of the flutes as described with reference to Figs. 5 and 6, the said dimensions being liable to be reduced or amplified, so as to alter the whole instrument and to nevertheless obtain
 20 a satisfactory result, and several other dimensions and combinations of dimensions may be used in the construction of my improved double flute without getting out of the frame of my invention.

25 Having thus fully described my invention and the manner in which the same is to be executed, I claim—

1. The combination of two flutes, said flutes being connected with each other, the tubes
 30 of each flute being provided with holes in the direction of the length of the flutes, the holes of each flute on a line at right angles to the

length of the instrument forming pairs so that the sounds issuing from each pair of holes
 are in exact consonance with each other, a 35 double valve for simultaneously opening and closing the pairs of holes, bridges or bands arranged between the tubes of the flutes at the upper or lower sides of the same, said
 40 bridges and bands forming bearings for the valve-rods, springs for keeping the valves normally open, and a connecting-bridge for the tubes on the lower side of the same, substantially as set forth.

2. A double flute consisting of two separate 45 tubes arranged alongside of each other, said tubes being of different lengths and diameters, a bridge for connecting said tubes, each tube provided with holes, the smaller tube having smaller holes, the larger tube having 50 larger holes and one hole of one tube placed approximately in a transverse line with a hole of the other tube, and double spring-actuated valves, each valve being adapted to open and
 55 close each transverse set of holes, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

ADOLF KRANTZ.

Witnesses:

E. IMER-SCHNEIDER,
 L. H. MUNIER.