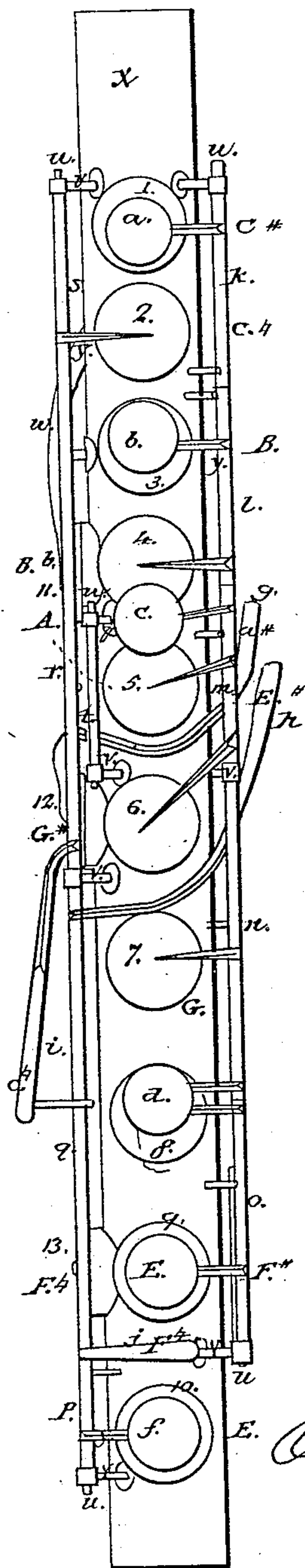


O. J. G. Wardrum,

Flute.

No. 94,795.

Patented Sept. 14, 1869.



Witnesses:  
E. B. Sherman  
O. W. Bond

Inventor:  
Oscar J. G. Wardrum  
PER. West & Bond  
attorneys

# United States Patent Office.

OSCAR J. G. WARDRUM, OF CHICAGO, ILLINOIS.

Letters Patent No. 94,795, dated September 14, 1869.

## IMPROVEMENT IN FLUTES.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, OSCAR J. G. WARDRUM, of the city of Chicago, in the county of Cook, and State of Illinois, have invented certain new and useful Improvements in Flutes; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification.

The drawings show the middle section of a flute, without the upper and lower sections, which, being made in the usual way, are not shown.

The nature of my invention consists in a new arrangement of the openings and stops, so as to make all of the openings or holes equidistant and of the same size, thereby improving the tone of the flute by giving each sound or tone an equal vent, and also in so arranging the keys that the fingering will be the same, or so near the same as the ordinary German flute, that a change from one to the other will not require any change of fingering.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

In the drawings—

X represents the middle section of a flute, or as they are sometimes made, the two middle sections. In this the openings are all located the same distance from each other, and are of the same size.

The drawing represents a metallic flute, with raised projections for the keys, but it may be made of wood, and the raised projections omitted.

On the sides of the flute are rods *u*, supported by posts *v*, similar to the Boehm flute. On these rods small cylinders or tubes *k*, *l*, *m*, *n*, *o*, *p*, *q*, *r*, and *t*, are placed, as shown. *t* is not necessarily a tube, as it may be made solid, with simple bearings in its supporting-posts.

The keys and stops are attached to these cylinders by the arms *y*, or by other suitable connections, and the keys *a*, *b*, *e*, and *f*, may, if desired, be attached directly to the stops.

Suitable return-springs for the stops are also attached, one of which is shown at *s*.

In operation, key *a* operates the stop 1; *b*, stops 3 and 4; *c*, stops 5 and 6; *d*, stop 7; *e*, stops 8 and 9; *f*, stop 10; *w*, stop 11; *g*, stop 12; *h* or *j*, stop 13;

and *i*, stop 2. The tones produced are indicated by the red letters.

By this arrangement of the stops and keys, it will be seen that the stops 4 and 11, 6 and 12, and 9 and 13, are not what are usually called "chose-keys," for the reason that the keys or stops 11, 12, and 13, are used when it is desired to produce the semitones, and 4, 6, and 9 are only used for giving equality of vent and space.

Stop 13 is operated by the little finger of the left hand at *h*, or by the third finger of the right hand at *j*, as may be desired.

This arrangement of the stops, while it does not change the mode of fingering from that of the common German flute, enables me to give a fullness and equality of tone, not produced in that instrument, for in that the equalization of the tones is, to a certain extent, equalized by making the finger-holes of unequal sizes, and placing them at different distances from each other, which arrangement includes so many conditions that it is necessarily imperfect.

These difficulties are overcome in the Boehm flute, but in that the arrangement of keys is such that a new system of fingering is required, so that, instead of taking the place of the German flute, it is recognized and used as a new and distinct instrument.

By my arrangement, I combine the fullness and equality of tone of the Boehm flute, with the ease of fingering the German flute, so that any person, having learned the use either of the German flute or my improved one, can use the other with equal facility.

Having thus fully described my improved flute,

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination and arrangement of the stops or openings 1 to 10, inclusive, so as to give an equal vent to each tone and semitone, substantially as specified.

2. The combination and arrangement of the keys *a*, *b*, *c*, *d*, *e*, and *f*, with their respective stops, substantially as and for the purposes described.

OSCAR J. G. WARDRUM.

Witnesses:

L. L. BOND,  
E. A. WEST.