

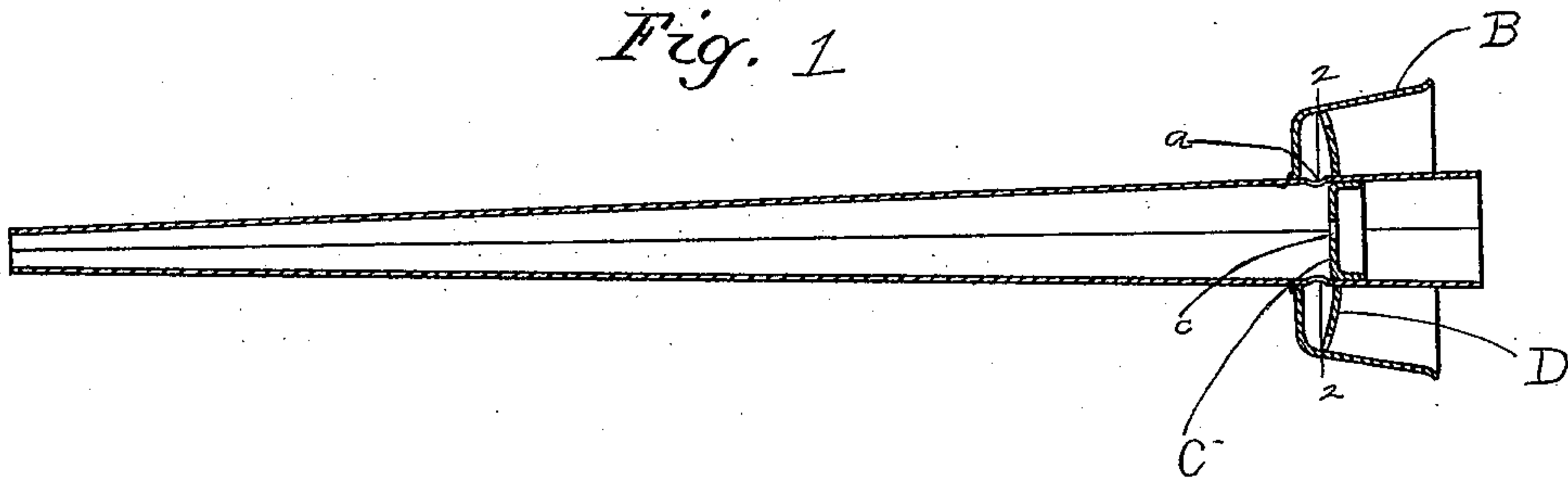
(No Model.)

R. S. THAIN.  
SOAP BUBBLE PIPE.

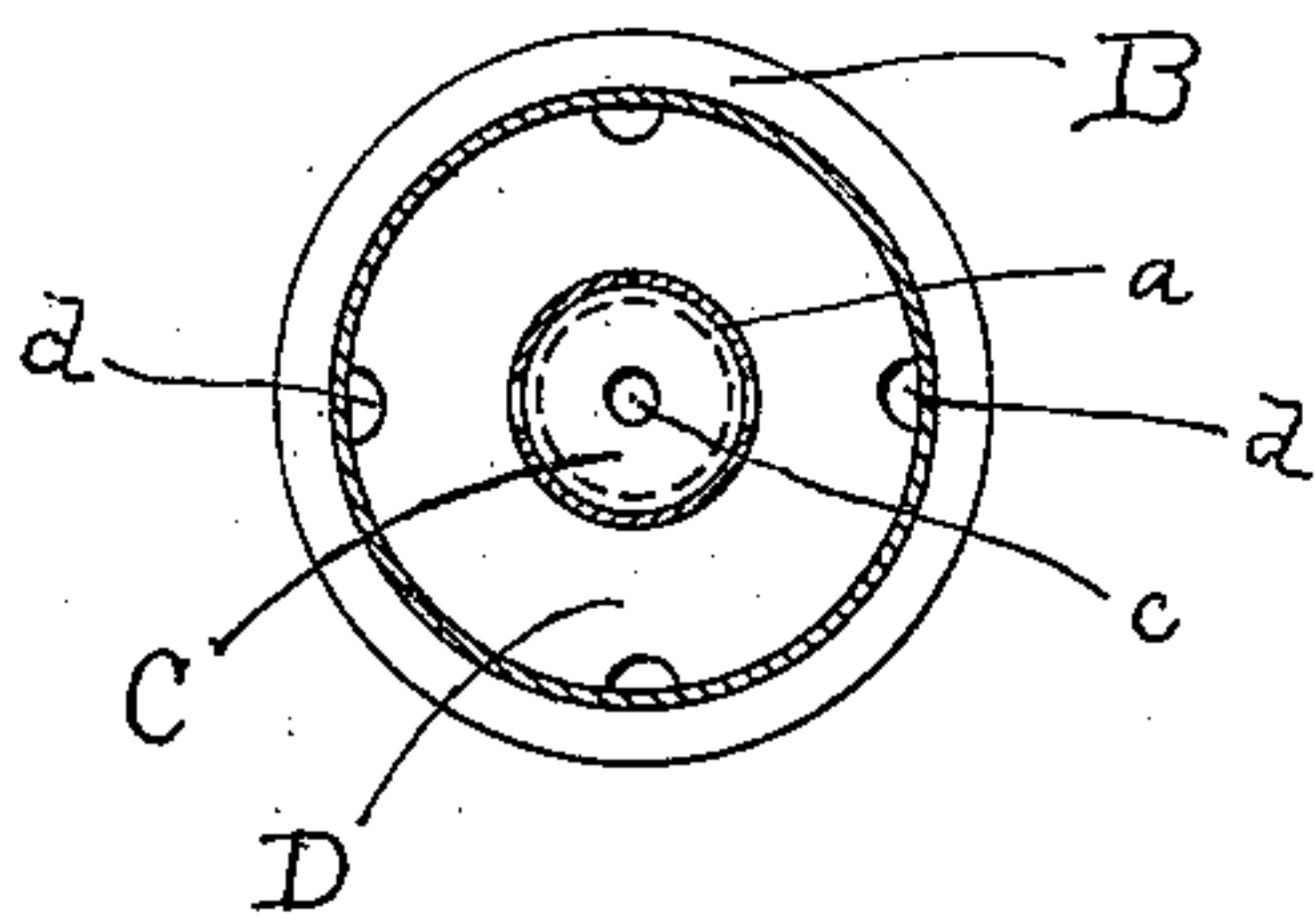
No. 555,411.

Patented Feb. 25, 1896.

*Fig. 1*



*Fig. 2*



Witnesses.

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# UNITED STATES PATENT OFFICE.

RICHARD S. THAIN, OF OAK PARK, ILLINOIS.

## SOAP-BUBBLE PIPE.

SPECIFICATION forming part of Letters Patent No. 555,411, dated February 25, 1896.

Application filed April 26, 1895. Serial No. 547,282. (No model.)

*To all whom it may concern:*

Be it known that I, RICHARD S. THAIN, a citizen of the United States, residing at Oak Park, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Soap-Bubble Pipes, which are fully set forth in the following specification, reference being had to the accompanying drawings, forming a part thereof.

10 In the drawings, Figure 1 is a longitudinal axial section of my improved soap-bubble pipe. Fig. 2 is a transverse section at the line 2 2 on Fig. 1.

The purpose of this invention is to provide an improved device which shall be capable of producing two bubbles, one within the other, adapted to be separately detached from the pipe, and thus to close up and float one within the other. In the only former device with which I am familiar adapted under any circumstances to produce this effect the air for inflating the two bubbles was delivered from the mouth into two ducts, one concentric within the other, and the success of the operator in producing two bubbles depended upon his skill in delivering the proper quantities of air into the two ducts to proportion the bubbles formed at their respective mouths so that their separation from the pipe without breaking one or both should be possible.

One purpose of the improvements shown in the present device is to render the effect practically independent of the skill of the operator in the respect above noted, and to adapt the device automatically, and by virtue of its own construction and proportions, to produce the two bubbles properly proportioned regardless of any skill or experience of the operator.

40 A is the stem or tube. It is preferably tapering, as shown, the smaller end being the mouthpiece.

B is a bell about the discharge or bubble end of the tube A, the discharge end, however, of the latter extending a little beyond the plane of the mouth of the bell. The bell is preferably slightly enlarged or widened, as shown, from its head toward the mouth. The tube A has lateral apertures *a a* beyond the junction of the head of the bell with said tube, said apertures, therefore, opening within the bell.

C is a diaphragm located in the tube A a little beyond the lateral apertures *a a*. This diaphragm has an aperture *c*, which may be, as shown, located at the center thereof. Preferably my device includes also a disk D, which is fitted tightly onto the tube A beyond the apertures *a a*, and fitting within the bell B, so that there is formed a comparatively shallow or thin chamber D' between the head of the bell and said disk D, the apertures *a a* opening and discharging radially—that is, laterally with respect to the tube within such chamber.

The periphery of the disk D is notched at *d d d d*, whereby are formed air-apertures leading from the chamber D' immediately adjacent to the wall of the bell B.

The operation of this device is that when the end is immersed in suitable suds, both the mouth of the tube A and the mouth of the bell being submerged, so that a film of suds is taken at both mouths and the operator blows through the mouthpiece, the air-blast or column is divided into two parts, one part passing through the diaphragm C, and serving to inflate a bubble, which adheres to the mouth of the tube A, and the remaining part passing through the apertures *a a* and impinging against and being spread by the wall of the bell B inflates a bubble which adheres to the mouth of the bell, and which, therefore, incloses the bubble formed at the mouth of the tube A. A slight jarring movement given to the device, either alone or accompanied by a little extra puff of the breath, will detach the inner bubble from the tube A, and the outer bubble may then be further inflated, and afterward in a similar manner detached from the bell, whereupon both bubbles will float, the one within the other, affording especially fine color effects by means of the double refraction and reflection of the two films.

The disk D is chiefly useful as a mechanical expedient for strengthening the device and simplifying the process of assembling the parts, though it has some value also as a means of distributing the air around the bell. Its mechanical value may be understood by noticing that the tube A may be made and is intended to be illustrated as made of sheet metal rolled up into the tapering tubular



form, the edges making a "butt-joint" and not lapping. The disk D having a central aperture adapting it to fit over the tapering tube thus formed, and to seat upon it at a point suitably beyond the lateral apertures *a a*, being placed thereon and forced to a tight seat, serves as a hoop to bind the rolled-up sheet metal of the tube tightly, and obviates the necessity of soldering the butt-joint, at least over the greater portion of the length of that joint. If, in practice, it is not found easy to roll the metal tightly enough to a mandrel to cause the edges to perfectly meet at the smaller end, it is very easy to solder this joint for an inch or more at the end by merely dipping this end of the tube in solder and shaking off the superfluous solder, which will thus be prevented from closing the mouthpiece, while adhering at the seam for the distance to which it is dipped.

The diaphragm C, I prefer to make, as illustrated, by cupping a disk enough larger than the tube at the point at which the diaphragm is to be located to allow for turning up a flange in the process of cupping, and producing thus a cupped disk whose flange serves to seat it correctly in a position directly transverse with respect to the tube when it is entered into the larger end of the latter; and the taper of the tube A causes it thus to seat at the correct position—the diameter of the cup having been once correctly fixed—and obviates the necessity for any stop-shoulder or other expedient for locating it in the tube; and the disk D, having been first forced onto the tube to bind it firmly, the cupped disk may be forced tightly into position, and by the extent of its flange bearing against the tapering wall of the tube it will obtain firm enough frictional hold to obviate the necessity for soldering or other means of securing it.

The bell B, also fitting closely on the tapered stem, serves the purpose of binding the butt-joint of the tube in the same manner as the disk C, and even without such disk the tube may be so tightly bound by the bell alone that the cupped disk forced in at the larger end may obtain a firm seat at the proper point.

In the simplest and most generic conception of my present invention it comprises a bowl having an annular partition, and a tube or stem having only one orifice at the mouthpiece, but divided at the discharge, so that the air-blast is discharged partly inside and partly outside of the annular partition in the bowl.

I claim—

1. In a soap-bubble pipe, a tubular stem having a single air-passage from the mouthpiece and having such air-passage restricted at a point back of the discharge end, whereby the end portion beyond the restriction constitutes a bowl or bell mouth, said stem being provided with lateral apertures back of such restriction, in combination with a bell mounted about the tube at a point back of the lat-

eral aperture and extending forwardly encompassing the tubular stem at a distance therefrom: substantially as and for the purpose set forth.

2. In a soap-bubble pipe, a tapered air-tube widening from the mouthpiece toward the bubble-forming end and having its air-passage restricted near said end and provided with lateral apertures back of such restriction, in combination with a bell mounted on such tube back of the lateral apertures and extending past the transverse plane of said apertures nearly to the plane of the discharge-mouth of the tube: substantially as set forth.

3. In a soap-bubble pipe, in combination with a tapered air-tube widening from the mouthpiece to the bubble-forming end, and having its air-passage restricted near said end and provided with lateral apertures back of such restriction, and a bell joined immediately to the outer surface of such tube back of the lateral apertures, and extending toward the plane of the bubble-forming mouth of the tube past the transverse plane of such apertures, and a disk mounted on the tube between the lateral apertures and the bubble end of the tube, and extending to the inner wall of the bell, and notched at the periphery, whereby the air delivered to the lateral apertures of the tube is spread against and delivered outward along the inner wall of the bell: substantially as set forth.

4. In a soap-bubble pipe, in combination with the tapered air-tube made of sheet material rolled into conical form with the edges forming a butt-joint, said tube having lateral apertures at a short distance back of the bubble-forming end, and an apertured diaphragm beyond said lateral apertures constituting a restriction of the direct air-passage through said tube; and a bell mounted on said tapering tube back of the lateral apertures therearound, and extending past the transverse plane of said apertures, and adapted to bind the tube close upon the butt-joint thereof: substantially as set forth.

5. In a soap-bubble pipe, in combination with a tapered air-tube formed of sheet metal rolled up with its edges making a butt-joint, said tube having an apertured diaphragm near the bubble end, and having lateral apertures back of said diaphragm and a disk centrally apertured to fit onto said tapered tube at a point between said lateral apertures and the bubble end, and a bell mounted on the tube back of the lateral apertures and extending past the disk: substantially as set forth.

6. In combination, substantially as set forth, the tapered tube and the bell mounted thereon, the tube having lateral apertures opening within the bell, the apertured and cupped disk C adapted to be entered into the larger end of the tube and to seat therein and to form a diaphragm between the lateral apertures of the tube and the end.

7. In a soap-bubble pipe, in combination



with the bowl having an annular partition forming a smaller open bowl, a tube or stem having a single orifice at the mouthpiece and discharging through separate orifices into the 5 bowls respectively back of their respective mouths.

In testimony whereof I have hereunto set

my hand, in the presence of two witnesses, at Chicago, Illinois, this 16th day of April, 1895.

RICHARD S. THAIN.

Witnesses:

CHAS. S. BURTON,  
JEAN ELLIOTT.