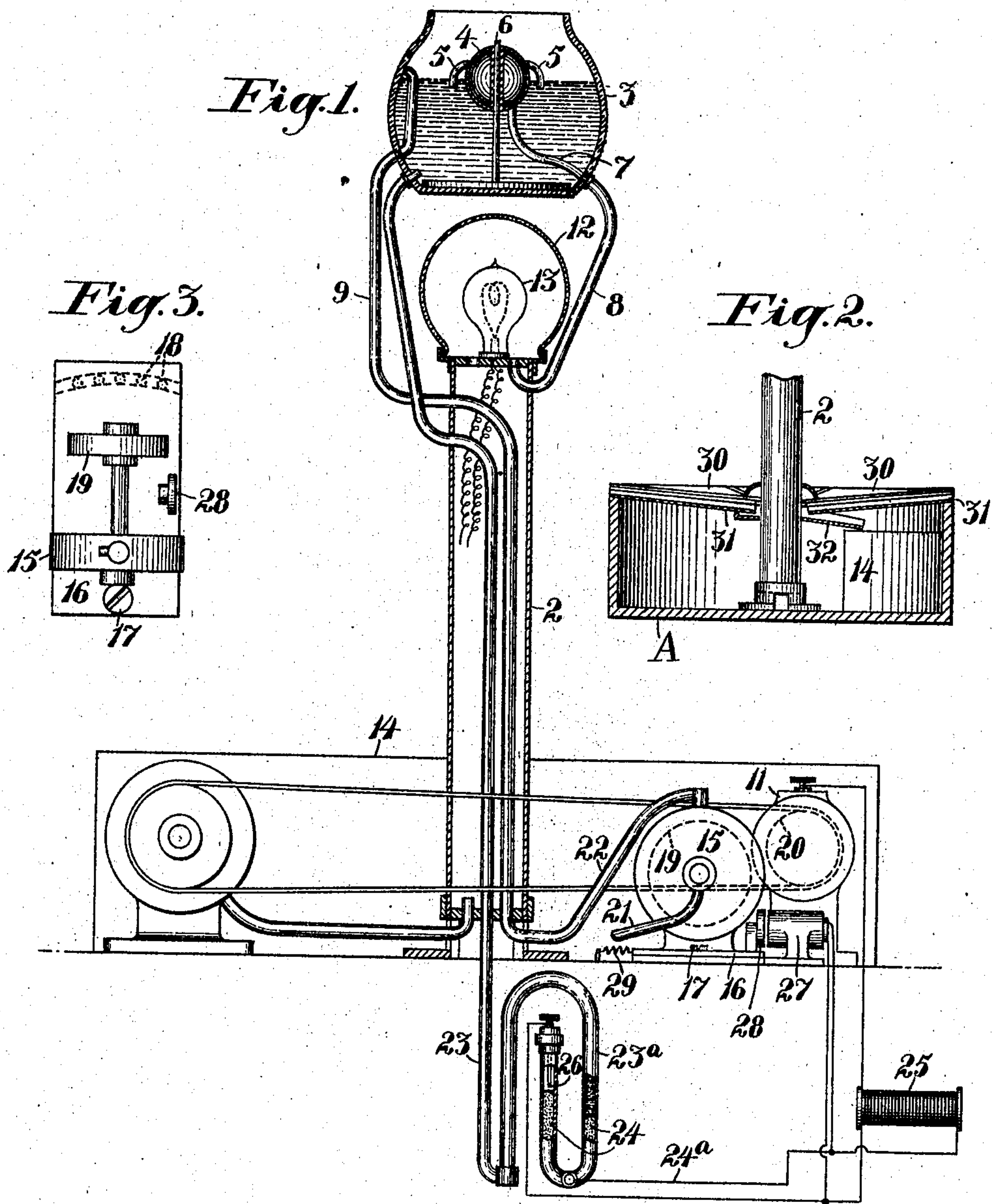


No. 814,889.

PATENTED MAR. 13, 1906.

S. H. TACY.
BUBBLE FOUNTAIN.
APPLICATION FILED OCT. 13, 1903.

2 SHEETS—SHEET 1.



Witnesses:

F. C. Liedner
J. H. Hulse

Inventor,

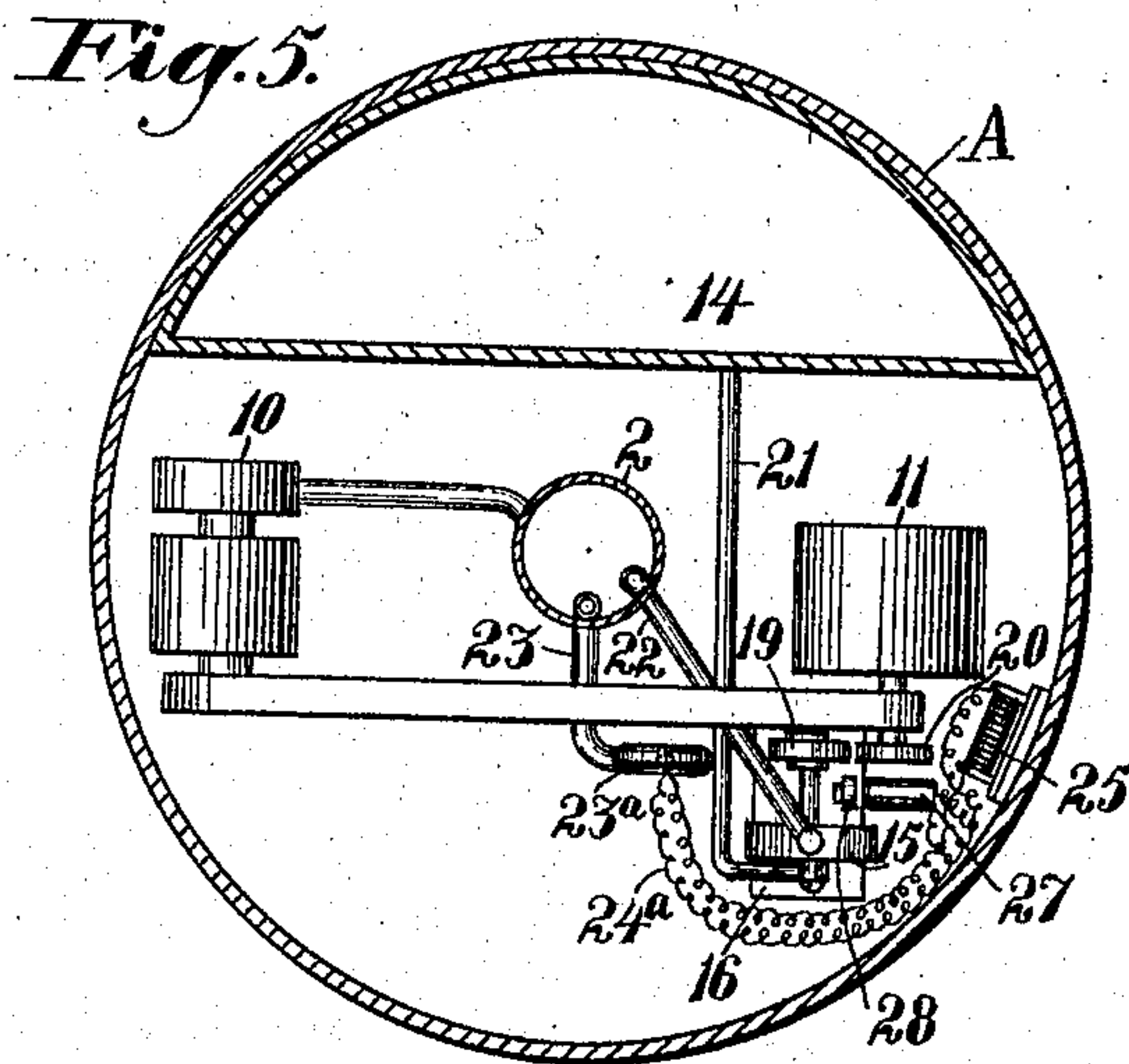
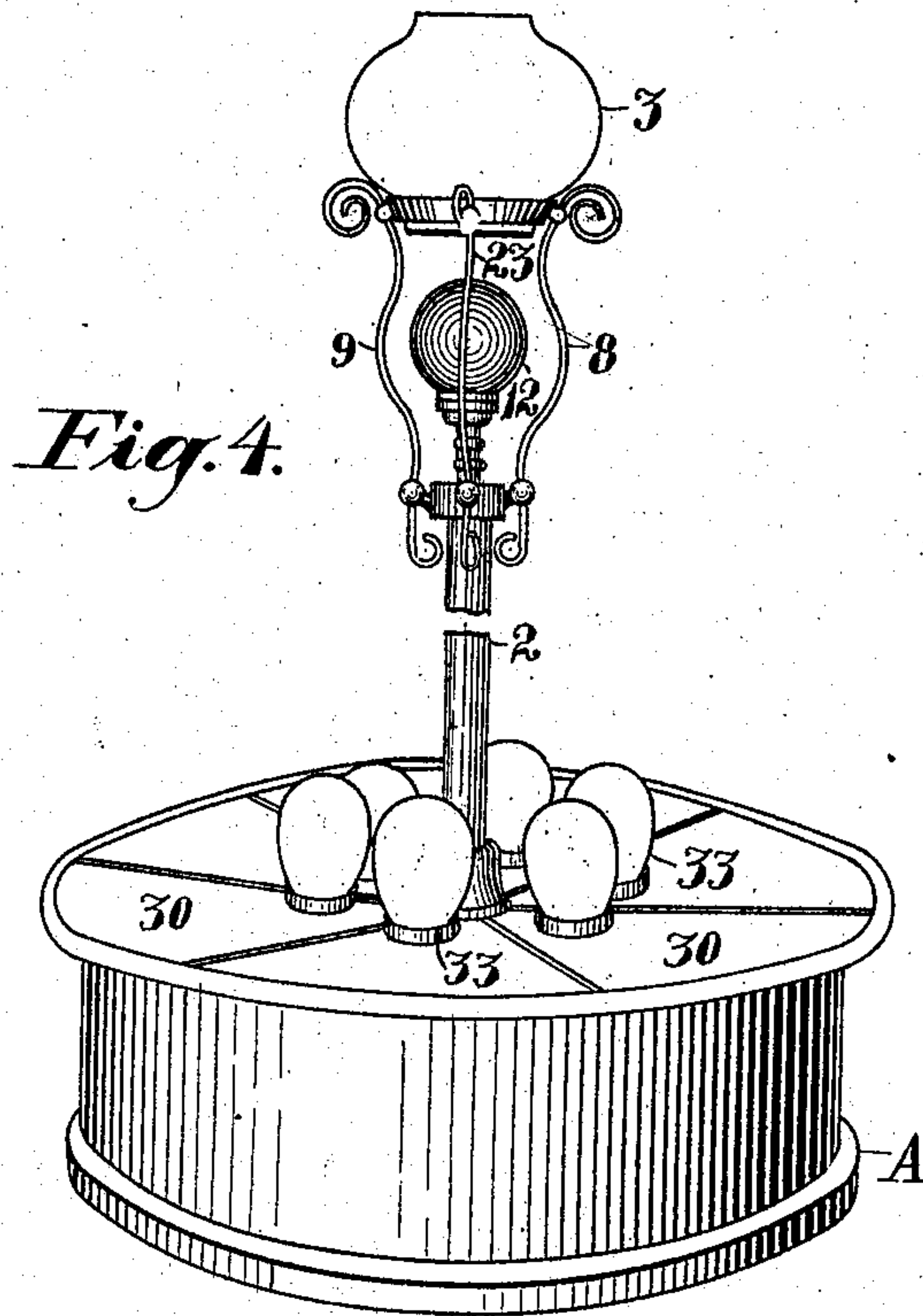
Samuel H. Tacy
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UNITED STATES PATENT OFFICE.

SAMUEL H. TACY, OF SAN FRANCISCO, CALIFORNIA.

BUBBLE-FOUNTAIN.

No. 814,889.

Specification of Letters Patent.

Patented March 13, 1906.

Application filed October 13, 1903. Serial No. 176,833.

To all whom it may concern:

Be it known that I, SAMUEL H. TACY, a citizen of the United States, residing in the city and county of San Francisco and State of California, have invented new and useful Improvements in Bubble-Fountains, of which the following is a specification.

My invention relates to improvements in apparatus for continuously blowing and discharging bubbles.

The object of my invention is to provide a compact attractive device of simple construction which is adapted to send forth a continuous stream of bubbles with varying artistic effects and which is capable of automatically replenishing the saponaceous or other liquid used and in which the same liquid may be used over and over again.

It consists of the parts and the construction and combination of parts hereinafter more fully described, having reference to the accompanying drawings, in which—

Figure 1 is a view of my apparatus, partially in section and partly diagrammatic. Fig. 2 is a vertical section through the base. Fig. 3 is a detail of the pump-carriage. Fig. 4 is a perspective of my apparatus. Fig. 5 is a plan of the operating mechanism.

A represents a suitable base of any desired size, configuration, and ornamentation adapted to house the operating mechanism and affording a support for the central hollow column 2, which is surmounted by the bowl 3. Bowl 3 is designed to contain a saponaceous or other bubble-forming solution. A float 4, having a plurality of peripheral discharge-nozzles 5, is slidable vertically on a standard 6 within the bowl. The float is connected with the air-supply pipe 8 by means of a flexible tube 7, and liquid is delivered into the bowl from a suitable source of supply by pipe 9. The discharge from pipe 9 is preferably directed against the sides of the bowl, so that the liquid may spread in a thin sheet and not tend to agitate the body of liquid within the bowl, and thereby interfere with the formation of the bubbles.

The nozzles are adapted normally to dip beneath the surface of the contained liquid and are capable of being turned from a vertical plane to vary the amount of dip, and therefore vary the size, quantity, and quality of bubbles blown. The float being vertically adjustable can accommodate itself to the rise

and fall of the liquid in the bowl, so that the nozzles once set for a certain depth will always maintain a uniformity of product.

A constant current of air is supplied to form the bubbles by a blower 10, driven from motor 11 and discharging into column 2, which is adapted as a conduit. Before passing from column 2 into the supply-pipe 8 the air is admitted to a chamber 12, where it is heated through the medium of an incandescent electric lamp 13, whereby the buoyancy of the bubbles is greatly increased.

Liquid is supplied to bowl 3 from time to time as needed from reservoir 14 by means of a centrifugal pump 15. The latter is mounted on a carriage or platform 16, which is pivoted at one end, as at 17, and supported at the other upon a row of balls or rollers 18.

The pump-shaft carries a friction-pulley 19 and the motor-shaft a corresponding pulley 20. When the pump-carriage is turned on its pivot to bring the two pulleys into engagement, liquid is drawn from the reservoir through tube 21 into the pump and discharged thence through a tube 22, leading up through column 2 to connect with supply-pipe 9.

In the present invention the actuation of the pump is correlative with the rise and fall of the liquid in bowl 3 above or below a certain predetermined level and is effected automatically by taking advantage of the variance in pressure of the column of liquid in the bowl in the following manner:

23 represents a stand-pipe extending from the bottom of the bowl down through the column 2. The lower end of pipe 23 is provided with a U-shaped section 23^a, preferably of glass and open to the air at one end, in which is contained a body of mercury, as at 24. The pressure of the liquid column on one end of the mercury naturally causes the other end of the mercury column to rise more or less. This mercury column forms one member of a switch which is connected by a wire 24^a with a coil 25, which latter is in a state of constant excitation. A contact-point 26, disposed in the path of the mercury column, forms the other member of the switch and is also connected with coil 25. Normally these two switch members are in contact; but the moment the liquid in bowl 3 falls below a certain predetermined level and the pressure in pipe 23 is consequently insufficient to hold the

mercury up to point 26 the contact between the latter and the mercury is broken. The breaking of the circuit at the mercury-switch throws the full current into a shunt-circuit in
 5 which is the electromagnet 27. The latter becoming energized acts upon an armature member 28 on the pump-carriage 16 to draw pulleys 19 and 20 into contact, whereupon the pump is set in motion.

10 The operation of the pump is only discontinued when the bowl has been replenished above the level sufficient to cause the mercury column to rise again and contact with point 26. The current from the coil 25 will then
 15 pass through the low-resistance mercury-switch and the magnet 27 will release armature 28, allowing the pump to travel away by reason of the spring 29. These intermittent periods of activity of the pump will occur
 20 whenever the bowl needs replenishing and once having set the contact 26 (which is adjustable) at the proper point and charged the bowl and reservoir and started the motor the further action of the apparatus is auto-
 25 matic. The bubbles pour out of the bowl in a continuous stream and flow thence down in sinuous form about the supporting-column 2 to the catch-basin formed upon the top of base A. This basin preferably consists of
 30 radially-disposed silvered-glass sections 30 inclined downwardly toward column 2. The adjacent edges of the sections are slightly separated, and a series of troughs 31 are dis-
 35 posed beneath the spaces between the sections, into which the drip from the bubbles and the condensed liquid is received and conveyed by the spout 32, which is common to all the troughs, back into reservoir 14. The
 40 circulation of liquid from the reservoir to the bowl and thence back again is continuous and the operation of the apparatus need only cease when the liquid has become impoverished.

As here shown, the pumping and blowing
 45 and operating mechanism is all housed within the base, making the apparatus compact and self-contained and rendering the operation of the device the more mystifying to the casual observer.

50 The artistic effects may be enhanced by the judicious use of colored electric globes, as shown at 33, and, as seen in Fig. 4, the supporting-brackets for the bowl may be adapted as the respective air-supply, liquid-supply, and
 55 gage-pipes 8, 9, and 23.

The bubble-forming fluid may be air, smoke, or any suitable gas. The liquid for use in the bowl while usually a rich soap-suds may be any liquid or viscid substance capa-
 60 ble of vesiculation.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a bubble-fountain, the combination
 65 with a liquid-container having a discharge-

orifice above the surface of the liquid and a liquid-inlet, of a submerged nozzle, a source of air-supply, a source of liquid-supply, liquid-conducting passages and means including pump mechanism disposed in said pas- 70
 sages for automatically returning liquid discharged from said container again to said container.

2. In a bubble-fountain, the combination of a liquid-container, a submerged nozzle, a 75
 source of air-supply, a liquid-containing reservoir, means for delivering the liquid discharged from the container back into said reservoir, a pump connected with said reser- 80
 voir and said container, and means for operating the pump to return the liquid to the container.

3. In a bubble-fountain, the combination of a liquid-container, a submerged nozzle, a 85
 source of air-supply and a source of liquid-supply, and pumping mechanism operated coördinately with the rise and fall of the liquid in the container to replenish the contents of the container.

4. In a bubble-fountain, the combination 90
 of a liquid-container, a submerged nozzle, a source of air-supply connected with said nozzle, a source of liquid-supply, pump mechanism and means for operating it intermit- 95
 tently on the fall of the liquid in the container below a predetermined level.

5. In a bubble-fountain, the combination of a liquid-container, a submerged nozzle, a 100
 source of air-supply connected with said nozzle, a source of liquid-supply and means for delivering liquid from said source of supply 100
 to the container coördinately with the rise and fall of the liquid in said container.

6. In a bubble-fountain, the combination of a liquid-container, a submerged nozzle, a 105
 source of air-supply, a source of liquid-supply, pumping mechanism and electrical connections, and switch mechanism operatable by the rise and fall of the liquid in the con- 110
 tainer to actuate said pumping mechanism.

7. In a bubble-fountain, a liquid-container having a vertically-disposed rigid guide, a float slidable on said guide, an adjustable 115
 nozzle carried by said float, and connections between said nozzle and a source of air-supply.

8. In a bubble-fountain, the combination of a liquid-container, a submerged nozzle, a 120
 source of air-supply and a source of liquid-supply, a liquid-inlet pipe discharging its contents against the sides of the interior of the container to prevent undue agitation of the liquid already in the container, and pump 125
 mechanism for delivering liquid from the source of supply through said pipe to the container.

9. In a bubble-fountain, the combination of a liquid-container, a submerged nozzle, a 130
 source of air-supply connected with said nozzle, means intermediate the source of supply

and nozzle for heating the air, and means for automatically delivering liquid to the container as its contents become diminished below a certain predetermined point.

5 10. In a bubble-fountain, the combination of a base, a liquid-container centrally supported thereon, a submerged nozzle, a catchment-basin beneath the container, a reservoir, air-supply means connected with said
10 nozzle, and pumping mechanism connected with the reservoir and container for returning the liquid to the container.

11. In a bubble-fountain, the combination of a liquid-container, a submerged nozzle, a
15 source of air-supply, a reservoir, pumping mechanism connected with said reservoir and container, an oscillating carriage for said pumping mechanism and means for operating said pumping mechanism intermittently by
20 the oscillation of the carriage.

12. In a bubble-fountain, the combination with a liquid-container, an inlet-pipe, a submerged nozzle, a stand-pipe connected with the container, a source of air-supply, a source
25 of liquid-supply, pump mechanism and means including a switch operatable by the pres-

sure in said stand-pipe for operating the pump mechanism.

13. In a bubble-fountain, the combination with bubble-forming mechanism, of a liquid- 30 container and a reservoir, an oscillating carriage a pump mounted thereon and means for operating the pump on the oscillation of the carriage.

14. In a bubble-fountain, the combination 35 of a liquid-container, a submerged nozzle, a stand-pipe connected with the container, a motor, a blower, a reservoir, a pump mounted on an oscillating carriage, flexible connections between said pump, reservoir and con- 40 tainer, electromagnetic means for effecting the oscillation of said carriage, and means for driving the pump from the motor intermittently on the oscillation of said carriage.

In testimony whereof I have hereunto set 45 my hand in presence of two subscribing witnesses.

SAMUEL H. TACY.

Witnesses:

GEO. T. KNOX,
EUGENIA VERGEZ.