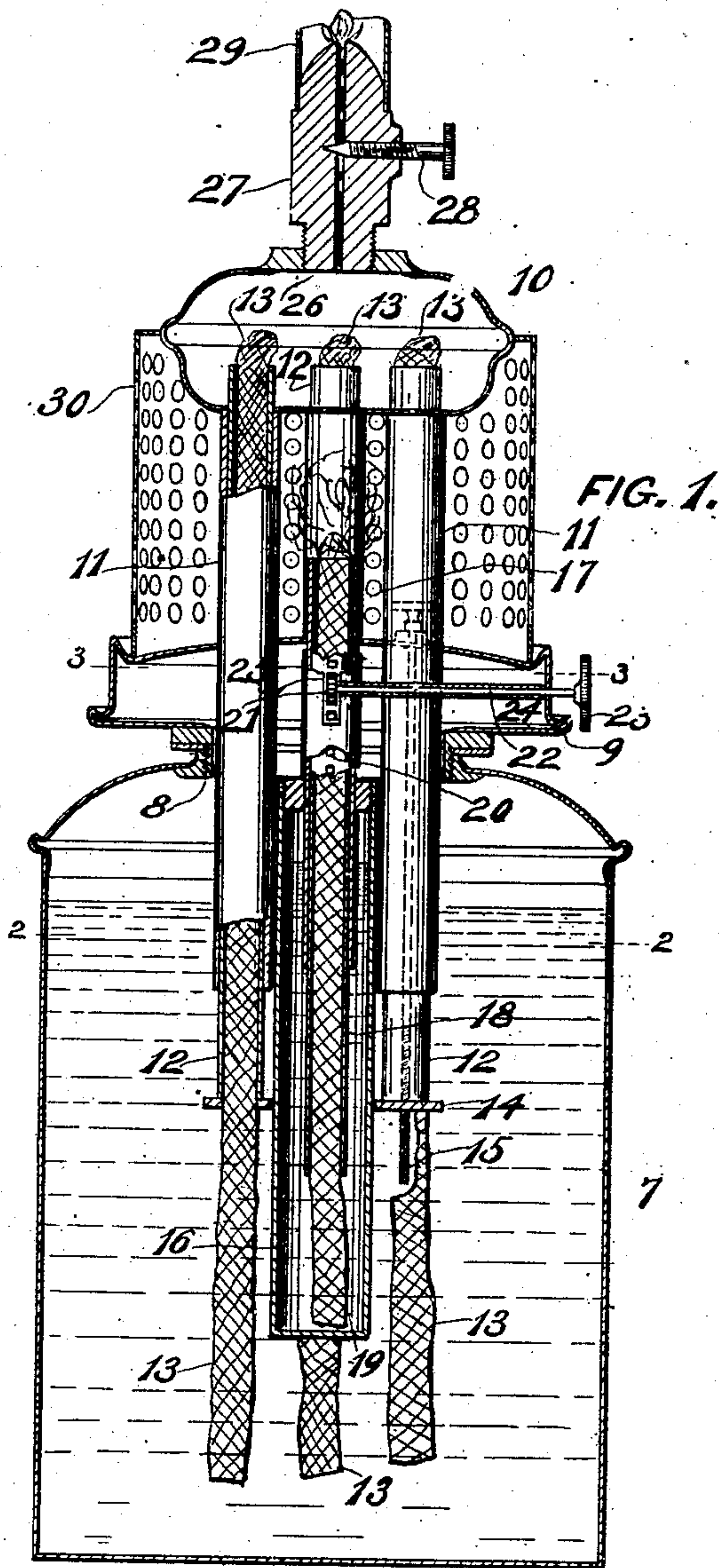


W. C. SHAFFER.  
GENERATOR AND BURNER.  
APPLICATION FILED MAY 6, 1907.

973,713.

Patented Oct. 25, 1910.

2 SHEETS—SHEET 1.



WITNESSES.

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2 SHEETS—SHEET 2.

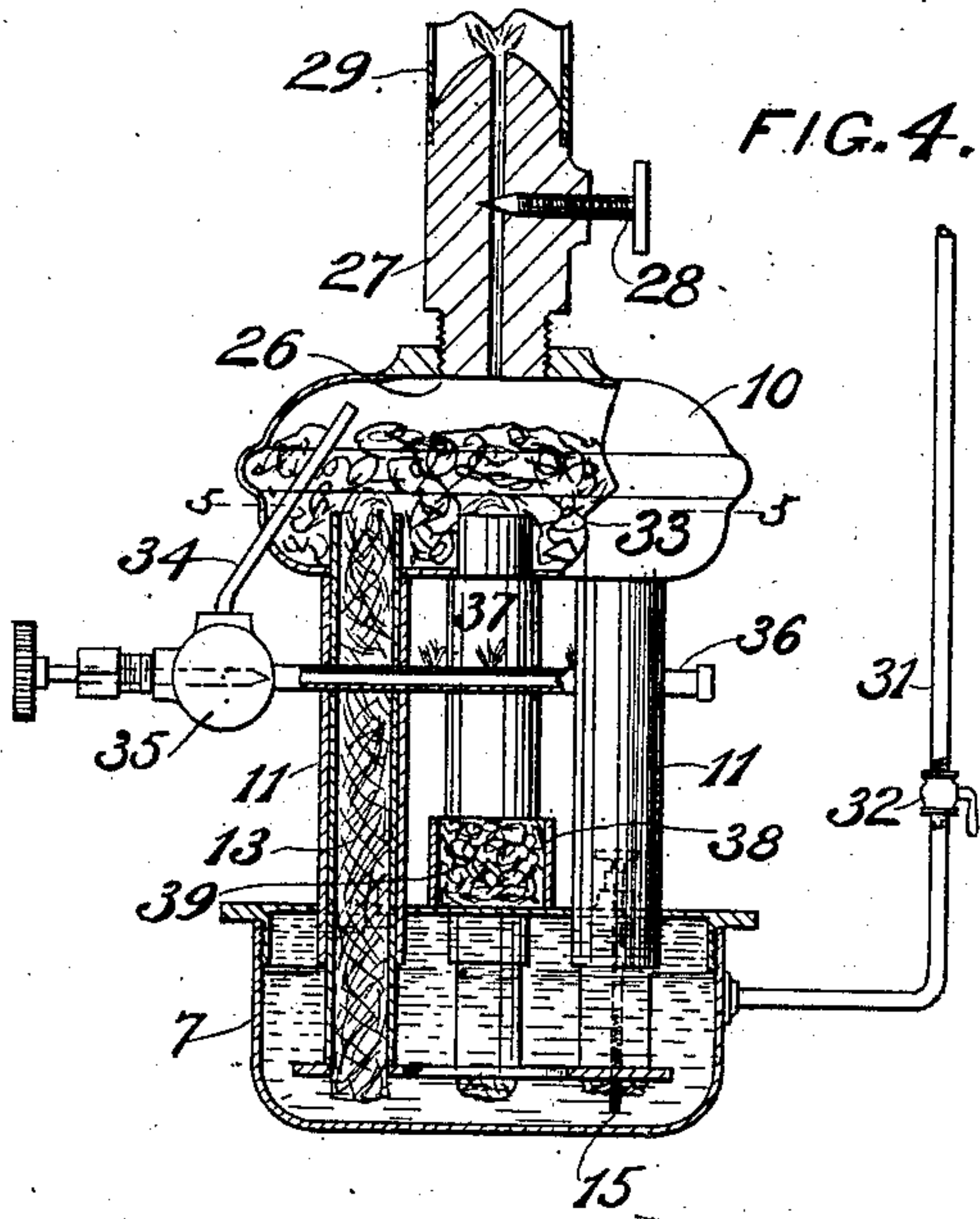


FIG. 2.

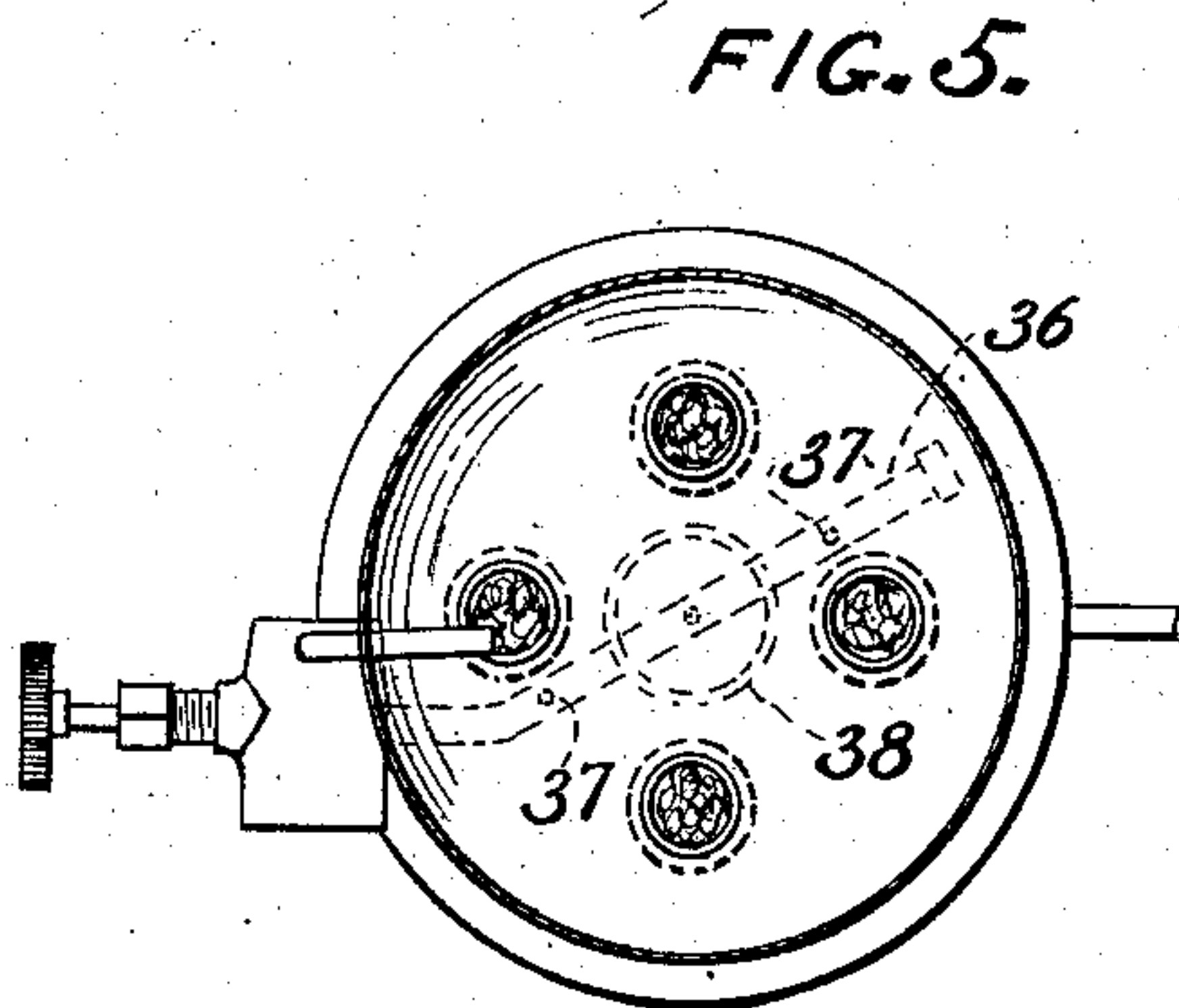
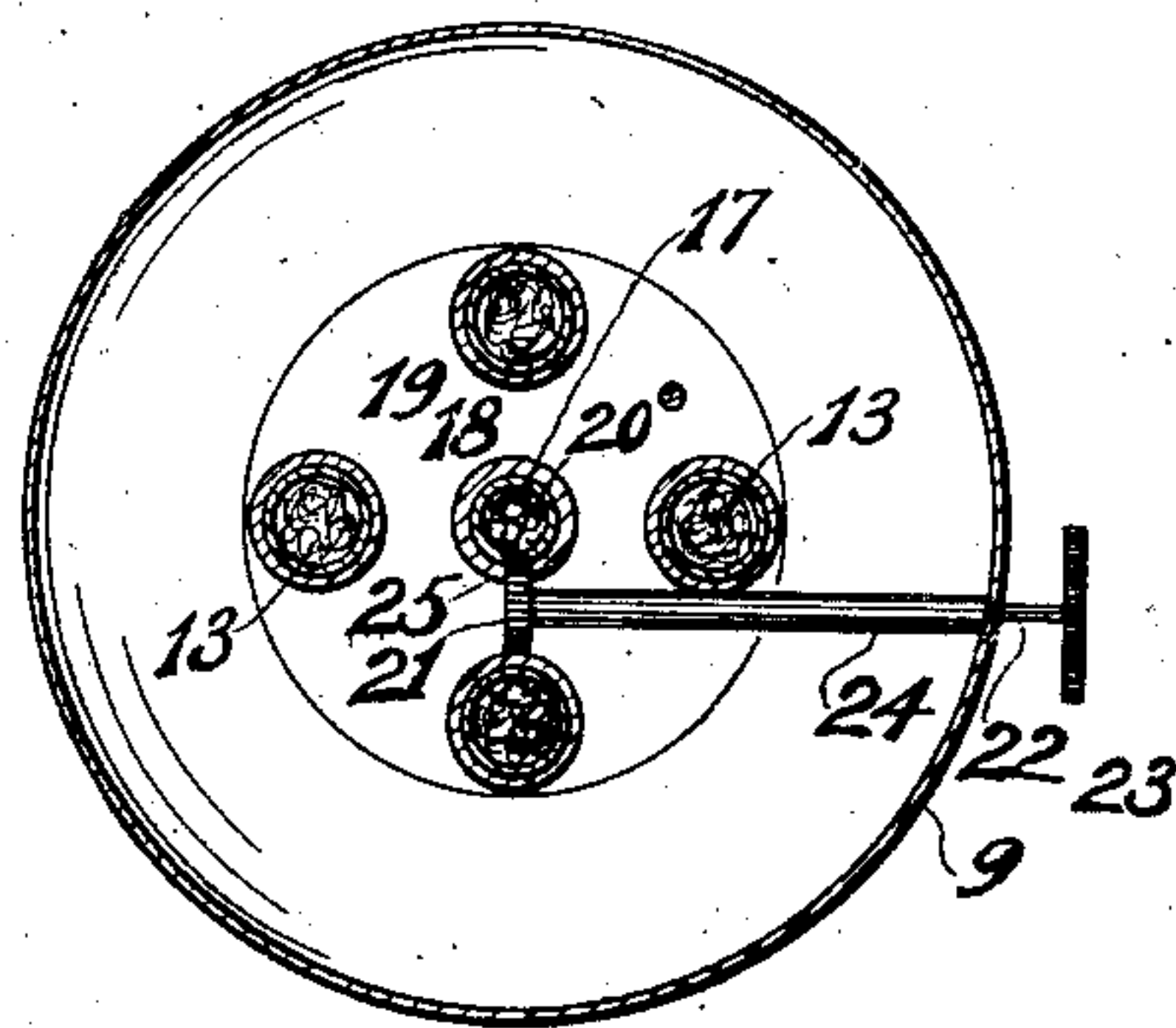
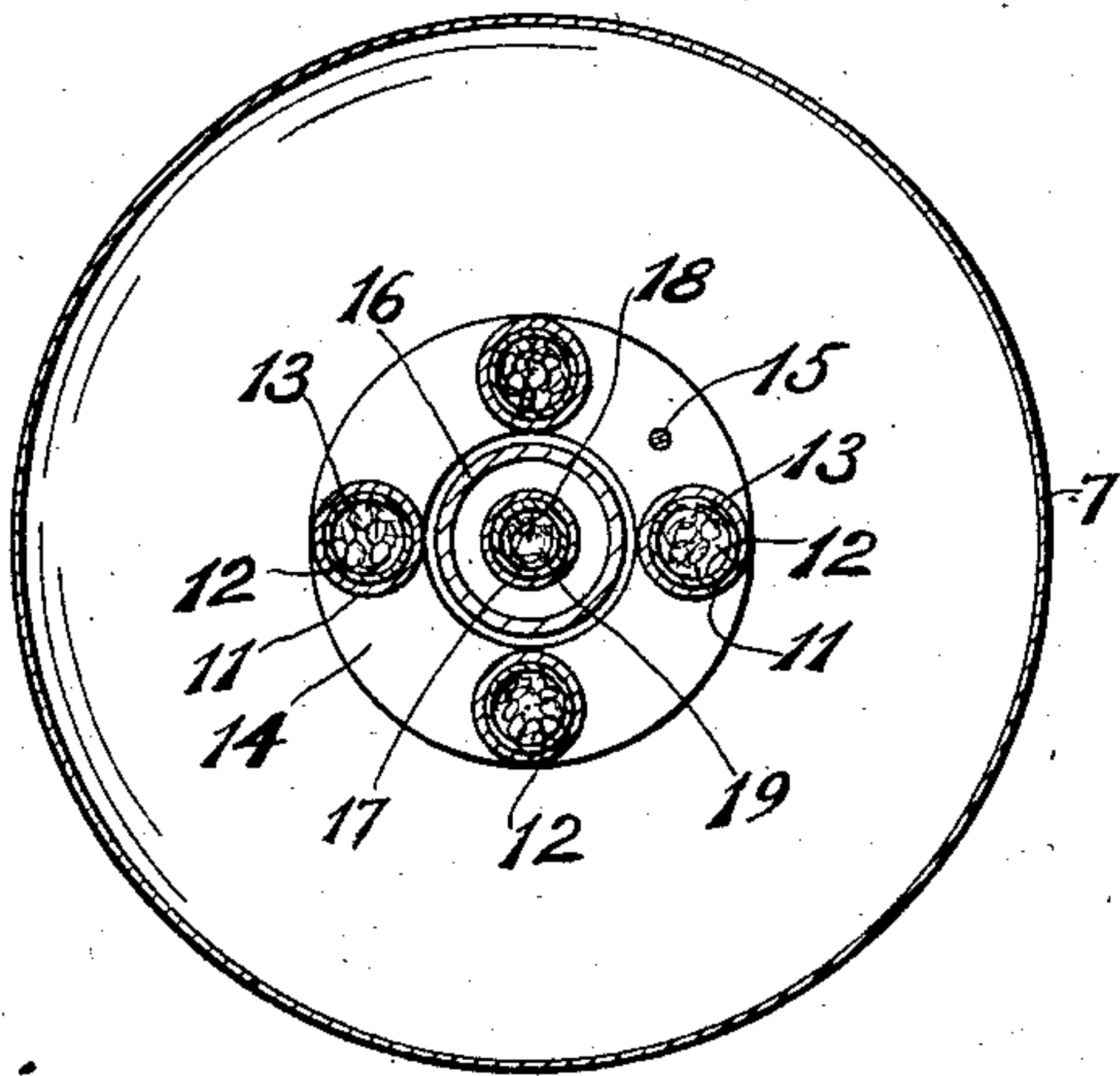
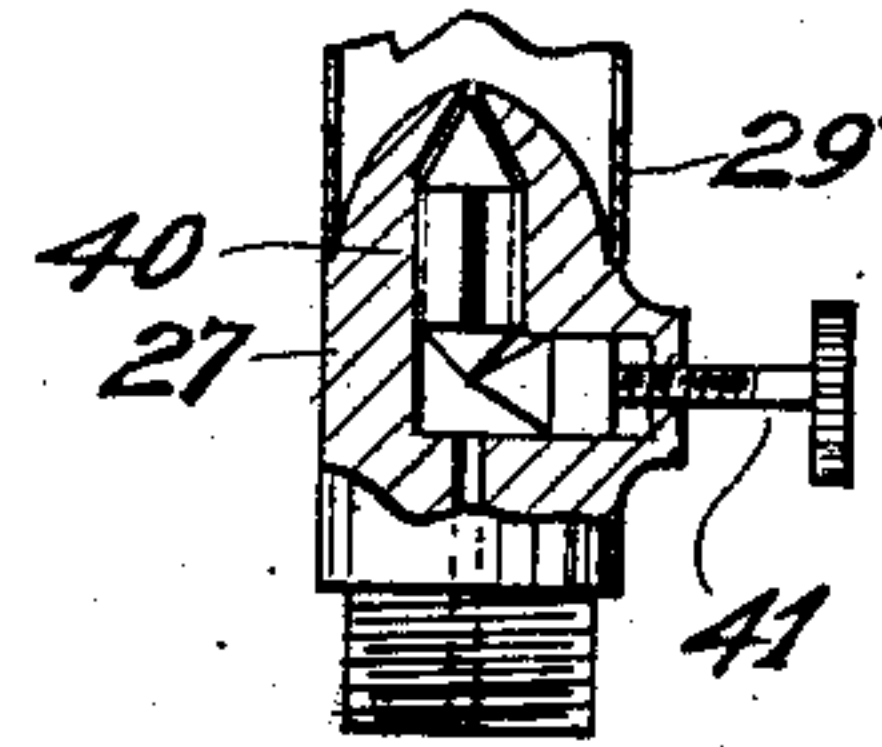


FIG. 3.

FIG. 6.



WITNESSES.

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# UNITED STATES PATENT OFFICE.

WILLIAM C. SHAFFER, OF MILWAUKEE, WISCONSIN.

GENERATOR AND BURNER.

973,713.

Specification of Letters Patent.

Patented Oct. 25, 1910.

Application filed May 6, 1907. Serial No. 371,978.

*To all whom it may concern:*

Be it known that I, WILLIAM C. SHAFFER, residing in Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented new and useful Improvements in Generators and Burners, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

My invention has relation to improvements in vapor generators and burners for illuminating and heating purposes.

One of the objects contemplated is to provide improved means for generating and burning vapors from alcohol or other volatile fluids.

A further object is to provide improved means for feeding the volatile liquid to the vaporizing chamber.

A further object is to provide an improved construction for supplying fuel to the heating means for heating the vaporizing chamber.

A still further object is to insulate the vaporizing chamber from the source of supply to prevent overheating.

With the above, and other incidental, objects in view, the invention consists of the devices and parts, or their equivalents, as hereinafter set forth.

In the accompanying drawings, Figure 1 is a central vertical section, parts broken away, of my burner attached to a fragment of a Welsbach burner; Fig. 2 is a section taken on line 2—2 of Fig. 1; Fig. 3 is a section taken on line 3—3 of Fig. 1; Fig. 4 shows a modified form of burner for the vaporizer; Fig. 5 is a section taken on line 5—5 of Fig. 4; and Fig. 6 is a modified form of needle valve for controlling the discharge of the vapor.

Like reference numerals refer to corresponding parts in all of the figures.

The numeral 7 indicates an ordinary lamp receptacle for holding alcohol or other volatile fluid, said receptacle provided with a screw-threaded filling opening 8. Threaded into this opening 8 is a hollow cap 9, serving as a cap for the opening and also as an insulating means between the fluid receptacle below and a casing above forming a vaporizing chamber 10 for preventing the heat of the vaporizing chamber being conveyed to the fluid receptacle.

The casing of the vaporizing chamber 10 is connected to the hollow cap 9 and sup-

ported therefrom by means of feed tubes 11, 11 which extend from the under side of said vaporizing chamber, down and through the hollow cap and into the fluid receptacle. Slidably mounted within the tubes 11, 11 are wick tubes 12, 12 provided with wicks 13, 13. These wicks are adapted to draw the fluid from the fluid receptacle up to the vaporizing chamber by capillary attraction. The lower ends of the tubes 12, 12 are connected together by means of an annular plate 14, and threaded to this plate is a threaded rod 15. The rod is positioned between two of the tubes 12, 12 and extends up and through the hollow cap 9 and is provided with an enlarged portion adapted to rest upon the top of the hollow cap and the tubes may be raised or lowered so as to properly position the wicks within the vaporizer chamber. A tube 16 closed at its lower end depends centrally from the lower part of the hollow cap and serves as a guide for the annular plate to slide on and also as a separate receptacle for holding a volatile fluid for the heater wick.

Extending up from the top of hollow cap 9 is a burner or tube 17, and this tube also extends downwardly through the cap and into the closed tube 16 a short distance. A wick tube 18 is slidably located within the tube 17 and is provided with a wick 19 adapted to draw the volatile fluid to the top or burner portion of the tube 17. One side of the wick tube 18 is provided with a series of notches or teeth 20 and a toothed wheel 21 is adapted to engage said teeth to raise and lower the wick tube 18 and thus control the flame of the burner 17. A stem 22 extends from the toothed wheel out through the cap and is provided with a milled head 23 for convenience in turning the toothed wheel. The stem 22 is supported and has its bearing in a bearing tube 24 secured to the hollow cap 9. The burner tube 17 has a portion cut out forming a slot 25 to allow the toothed wheel to engage the notches of the wick tube. The top of the vaporizing chamber 10 is provided with a screw-threaded opening 26 and into this opening is connected a discharge pipe 27 provided with a needle valve 28 adapted to control the discharge of the vapor from the vaporizing chamber.

A fragment of a Welsbach burner indicated by 29 is of the well known type and it is thought sufficient to merely state that



after the vapor is discharged from the discharge pipe 27 it is burned in a mantle in the ordinary manner, or it may be connected to a burner used for heating purposes and the operation will be the same. A perforated tube 30 surrounding the tubes 11, 11 and burner 17 may be used if desired, as a safeguard against anything accidentally coming in contact with the flame of the burner and also to confine the heat of the flame below the vaporizing chamber and get better results with a smaller size flame.

In the construction thus far mentioned the vaporizing chamber is heated by burning the volatile fluid direct by means of a wick and tube in the same manner as an ordinary kerosene lamp, but in the construction illustrated in Figs. 4 and 5, the vaporizing chamber is heated by burning the vapor generated in the vaporizing chamber itself and is more economical in use than the first mentioned construction.

The receptacle 7 of Fig. 4 is supplied with volatile fluid from an elevated source of supply by means of a feed pipe 31 provided with a controlling valve 32. The fluid will flow by gravity into and fill the receptacle 7 and saturate the wicks 13 and will rise in the tubes 11, 11, overflow therefrom and also saturate the wicking 33 within the vaporizing chamber 10. A tube 34 leads from the upper part of the vaporizing chamber to a valve 35, and another tube 36 provided with perforations 37 on the upper side thereof, extends from the valve to a position beneath the vaporizing chamber and serves as a burner for heating the vaporizing chamber with the vapor generated therein.

In order to initially heat the vaporizing chamber to supply vapor to the burner 36, I have provided a cup 38 filled with wicking 39 and by pouring a small quantity of volatile fluid on the wicking and igniting the same the vaporizing chamber will be heated sufficiently to generate vapor which will flow through the tube 34 to the valve 35 and to the burner tube 36 and out through the perforations 37 where it will become ignited and continue to heat the said chamber. The supply of vapor to this burner is controlled by the valve 35. The vapor to the illuminating or heating burner, as the case may be, is controlled by the discharge pipe 27 and the valve 28 in the same manner as before described.

Fig. 6 shows a modified form of controlling valve for the discharge pipe 27 in which the valve proper is independent of the adjusting screw but controlled by said screw. It consists of a valve 40 provided with conical ends, and an adjusting screw 41, provided with a conical end adapted to engage the lower conical end of the valve to raise and lower the same.

In using the construction first mentioned

the receptacle 7 and the tube 16 are filled with a volatile fluid, for instance, denatured alcohol. The wicks 13 will soon become saturated therewith and draw the alcohol into the vaporizing chamber by capillary attraction. The wick 19 will also become saturated and upon igniting this last mentioned wick where it extends through the tube beneath the vaporizing chamber, the said chamber will soon become hot enough to vaporize the alcohol discharged therein by the wicks 13, 13, and from this chamber the vapor is discharged through the discharge pipe connected thereto, and the discharge is controlled by the valve in said pipe. This discharge pipe may be connected to an illuminating tip or mantle, to a burner for heating purposes or to anything with which it is desired to use the vapor for any purpose.

The heating and vaporizing of the alcohol is facilitated by having the heating burner disposed between and adjacent to the feed tubes whereby the fluid is initially heated before passing into the vaporizing chamber. The flow of the fluid into the vaporizing chamber is controlled by raising or lowering the wick tubes.

In the modified form the fluid flows by gravity into the vaporizing chamber and is controlled by the valve in the pipe leading to the source of supply, and also by raising and lowering the wick tubes. In this construction the vaporizing chamber is initially heated by means of a small quantity of alcohol placed on some wicking within a cup beneath the chamber, and when the chamber is heated sufficiently to vaporize the alcohol within said chamber the vapor discharged through the apertures of the burner will become ignited and continue to burn as long as the valves are open and fluid is supplied to the vaporizing chamber. As only a very small amount of vapor will be necessary to keep the chamber hot the greater amount of the vapor generated will pass out through the discharge pipe to be used for any purpose desired.

It is to be understood that any fluid adapted for illuminating or heating purposes, may be used which may be vaporized by heat.

What I claim as my invention is:

1. A generator and burner for volatile fluids, comprising a supply receptacle, a vaporizing chamber, tubes connecting the supply receptacle to the vaporizing chamber, other tubes within the said first mentioned tubes, means for raising and lowering the last mentioned tubes, wicks within the last mentioned tubes for feeding a volatile fluid to the vaporizing chamber from the supply receptacle, a burner beneath said vaporizing chamber adapted to heat said chamber to vaporize the volatile fluid contained therein, means interposed between the sup-



ply receptacle and the burner for heating the vaporizing chamber for insulating the heat of said burner from the supply receptacle, and a valve controlled discharge pipe leading from said chamber to a burner.

2. A generator and burner for volatile fluids, comprising a supply receptacle, a vaporizing chamber, tubes connecting the supply receptacle to the vaporizing chamber, other tubes within the said first mentioned tubes, means for raising and lowering the last mentioned tubes, wicks within the last mentioned tubes for feeding a volatile fluid to the vaporizing chamber from the supply receptacle, a burner beneath said vaporizing chamber adapted to heat said chamber to vaporize the volatile fluid contained therein, an air chamber positioned between the burner for heating the vaporizing chamber and the supply receptacle, and a valve controlled discharge pipe leading from said vaporizing chamber to a burner.

3. A generator and burner for volatile fluids, comprising a supply receptacle, a hollow cap connected to said receptacle, a vaporizing chamber, tubes connected to the vaporizing chamber and passing through said cap into the supply receptacle, other tubes within the first mentioned tubes, wicks within the last mentioned tubes adapted to feed a volatile fluid to the vaporizing chamber, a burner tube disposed beneath the vaporizing chamber and also passing through said cap and into the supply receptacle, a wick within the burner tube for supplying the volatile fluid to the burner portion of said tube for heating the vaporizing chamber, and means for controlling the discharge of vapor from the vaporizing chamber.

4. A generator and burner for volatile fluids, comprising a supply receptacle, a hollow cap connected to said receptacle, a vaporizing chamber, tubes connected to the vaporizing chamber and passing through said cap into the supply receptacle, other tubes within said first mentioned tubes, means for raising and lowering the last mentioned tubes, wicks within said last mentioned tubes adapted to feed a volatile fluid to the vaporizing chamber, a burner tube disposed beneath the vaporizing chamber and also passing through said cap and into the supply receptacle, a wick within the burner tube for supplying the volatile fluid to the burner portion of said tube for heat-

ing the vaporizing chamber, and means for controlling the discharge of vapor from the vaporizing chamber.

5. A generator and burner for volatile fluids comprising a supply receptacle, a hollow cap connected to the supply chamber, a vaporizing chamber located above the hollow cap, a screen resting on the hollow cap and surrounding a portion of the vaporizing chamber, tubes connected to the vaporizing chamber and passing through said cap and into the supply receptacle, other tubes within the first mentioned tubes, a plate connecting all of the last mentioned tubes together, means for raising and lowering said plate, wicks within the last mentioned tubes for feeding a volatile fluid to the vaporizing chamber from the supply receptacle, a burner adjacent to the vaporizing chamber adapted to heat said chamber to vaporize the volatile fluid contained therein, and a valve for controlling the discharge of said vapor.

6. A generator and burner for volatile fluids comprising a supply receptacle, a hollow cap connected to the supply chamber, a vaporizing chamber located above the hollow cap, a screen resting on the hollow cap and surrounding a portion of the vaporizing chamber, tubes connected to the vaporizing chamber and passing through said cap and into the supply receptacle, other tubes within the first mentioned tubes, a plate connecting all of the last mentioned tubes together, a rod threaded to said plate for raising and lowering the tubes connected thereto, wicks within the last mentioned tubes for feeding a volatile fluid to the vaporizing chamber from the supply receptacle, another supply receptacle extending into the first mentioned supply receptacle, a tube extending into this last mentioned supply receptacle, another tube within this tube, a toothed wheel for raising and lowering the inner tube, a wick within the inner tube to heat the vaporizing chamber to vaporize the volatile fluid contained therein, and a valve for controlling the discharge of said vapor.

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

WILLIAM C. SHAFFER.

Witnesses:

C. H. KEENEY,

ANNA F. SCHMIDTBAUER.