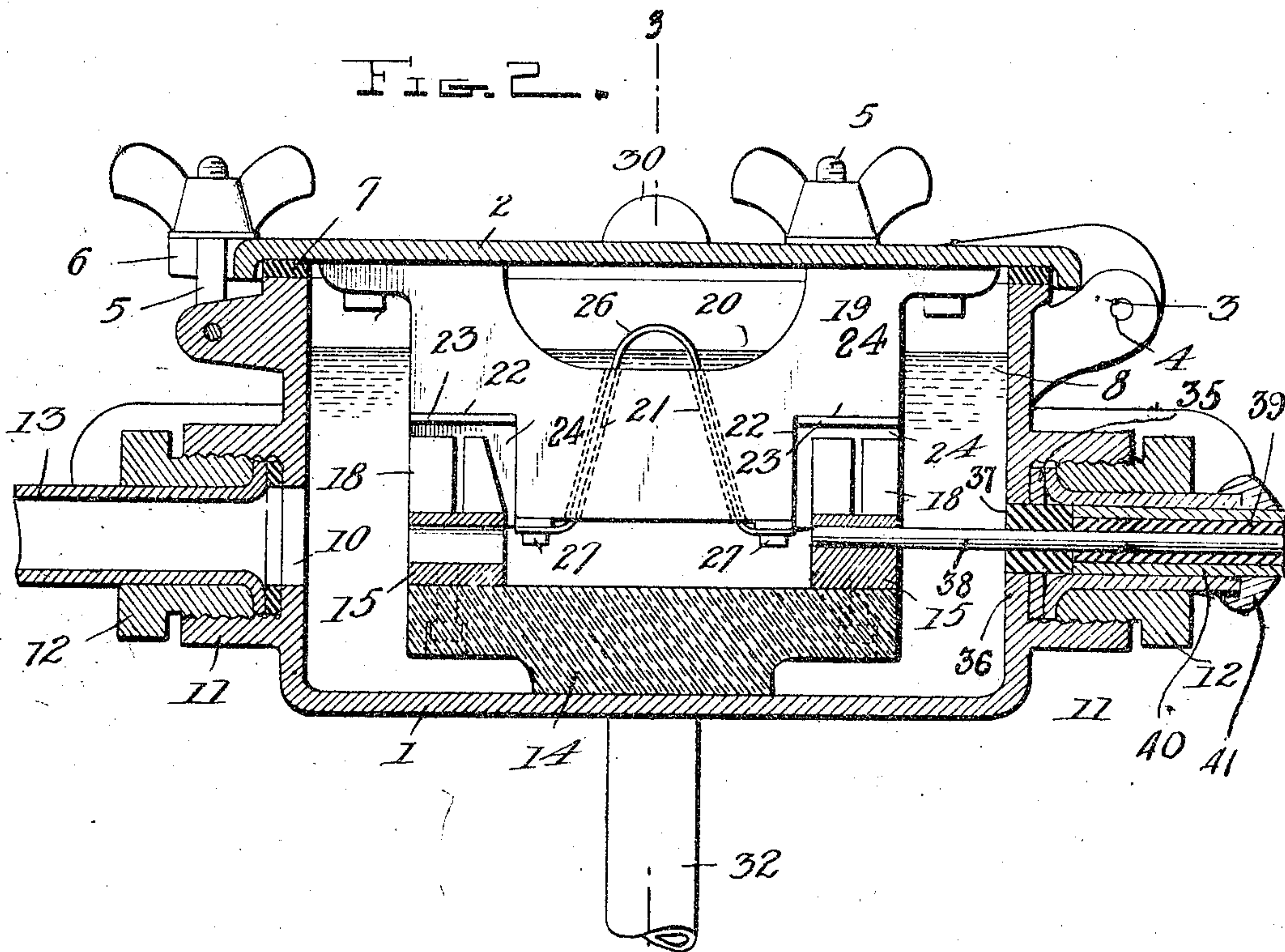
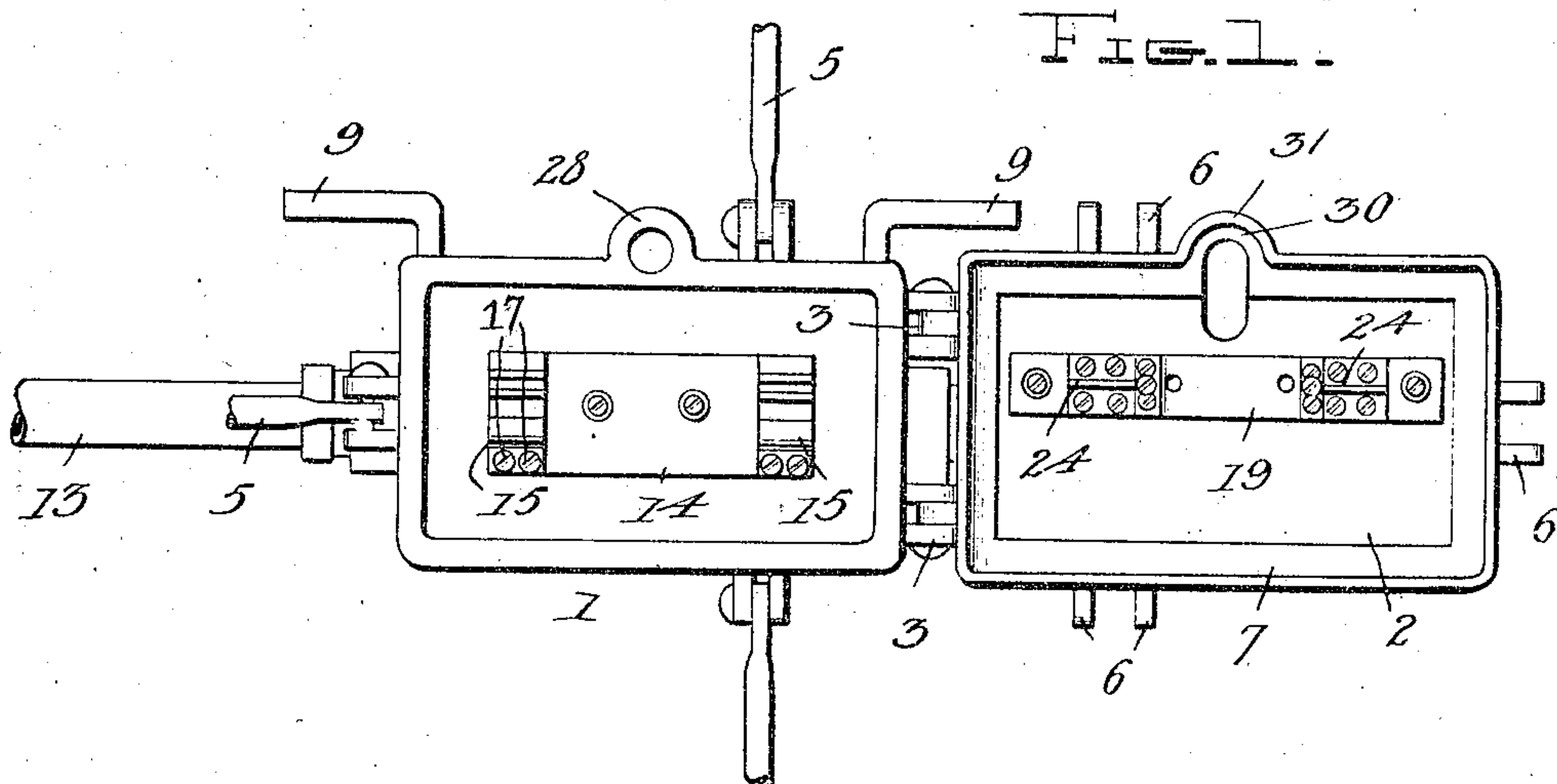


C. N. PRATT.
OIL OR THERMAL CUT-OUT.
APPLICATION FILED JUNE 6, 1907.

907,872.

Patented Dec. 29, 1908.

2 SHEETS—SHEET 1.



Witnesses

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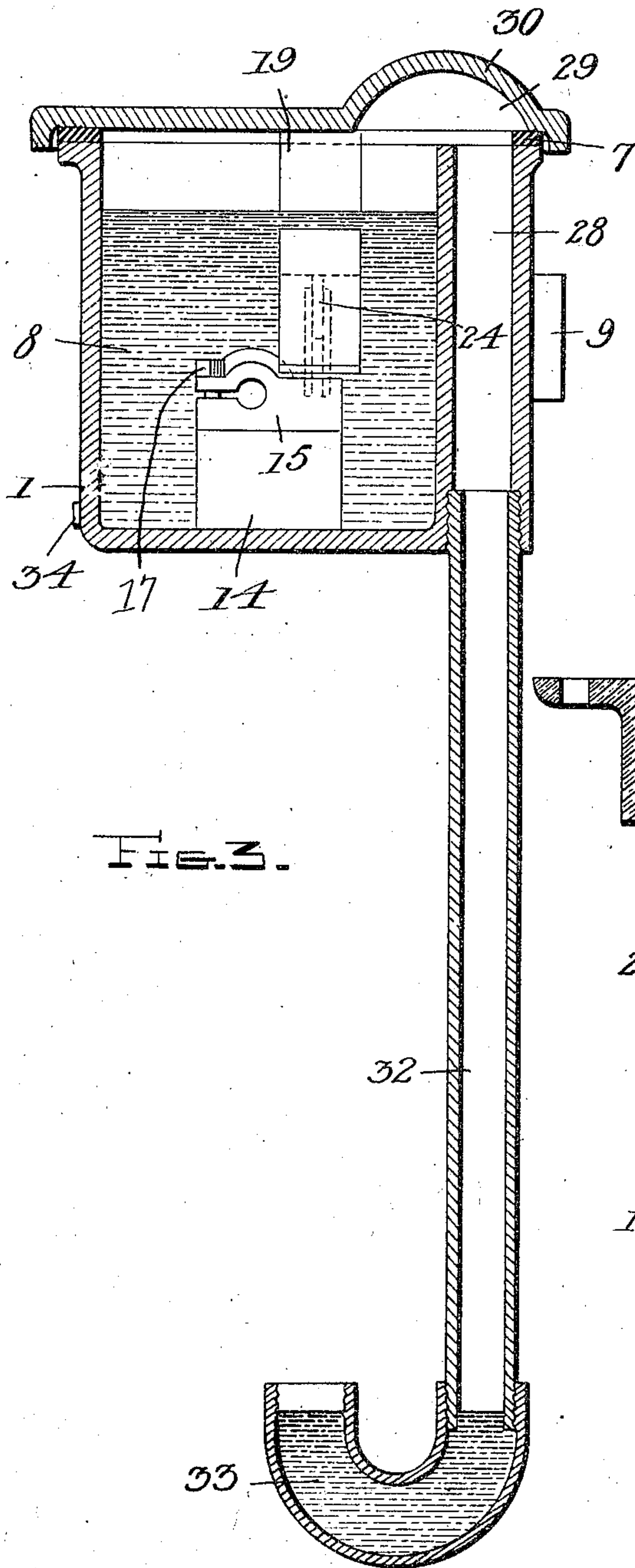


FIG. 3.

FIG. 5.

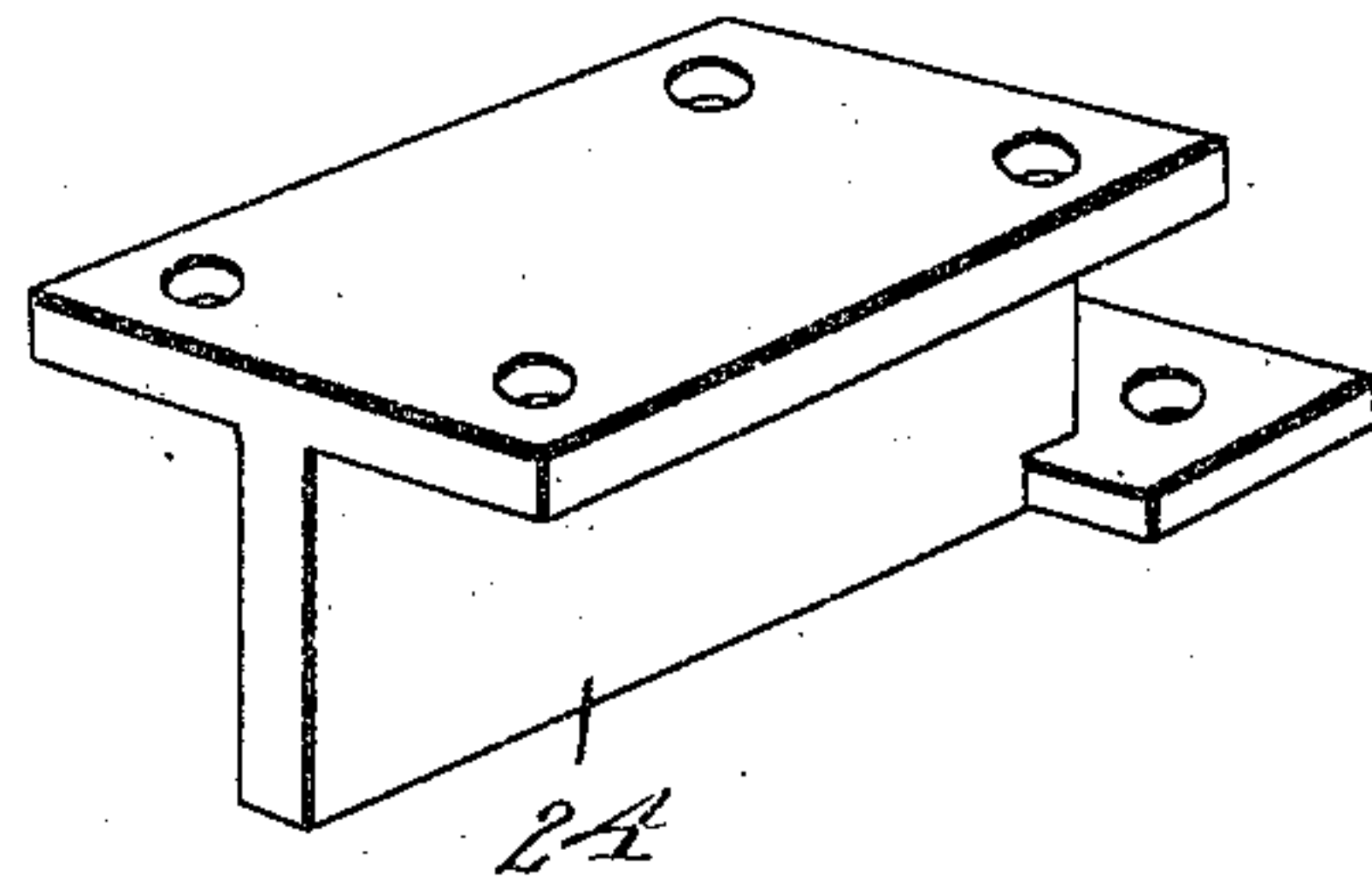


FIG. 4.

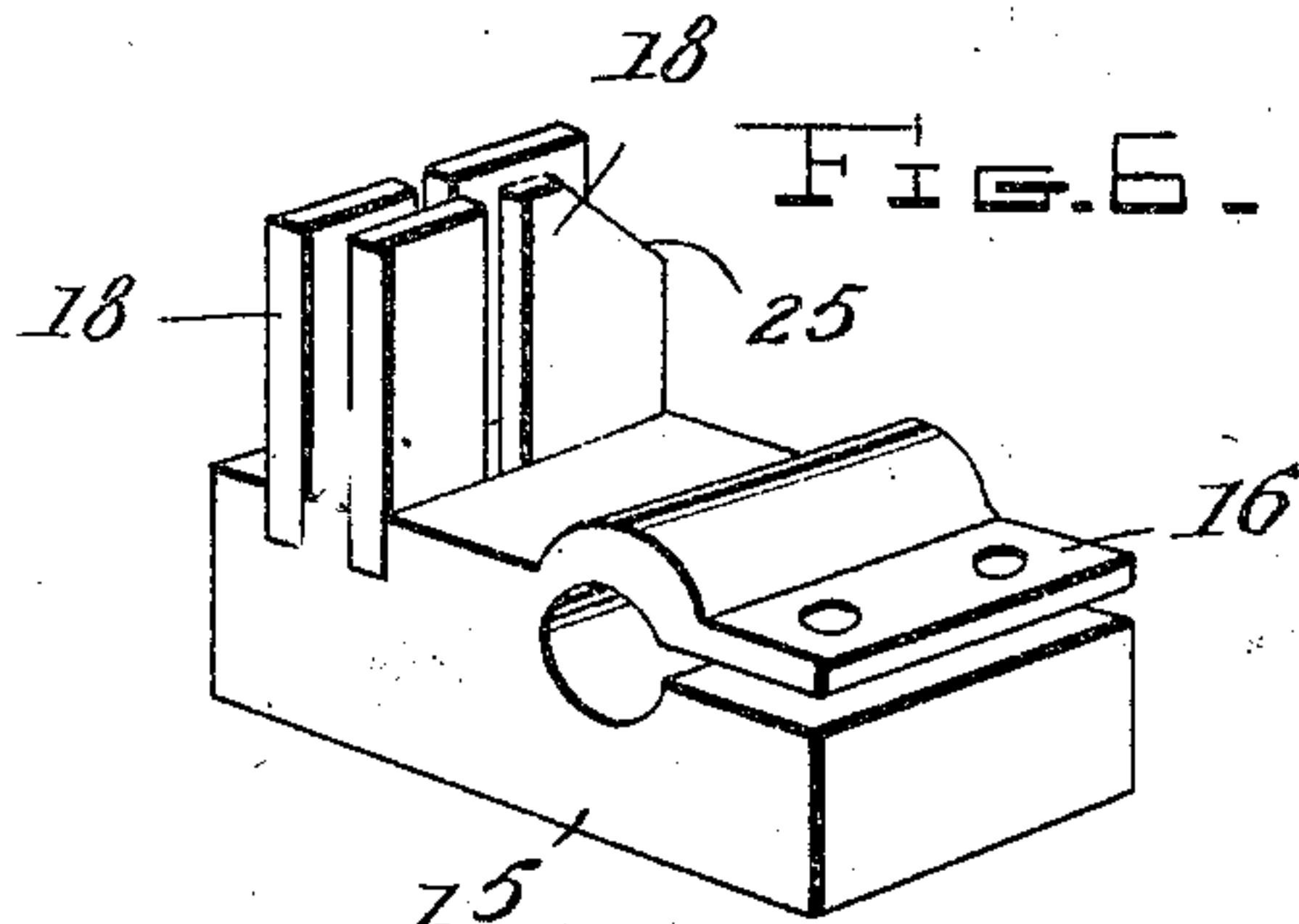
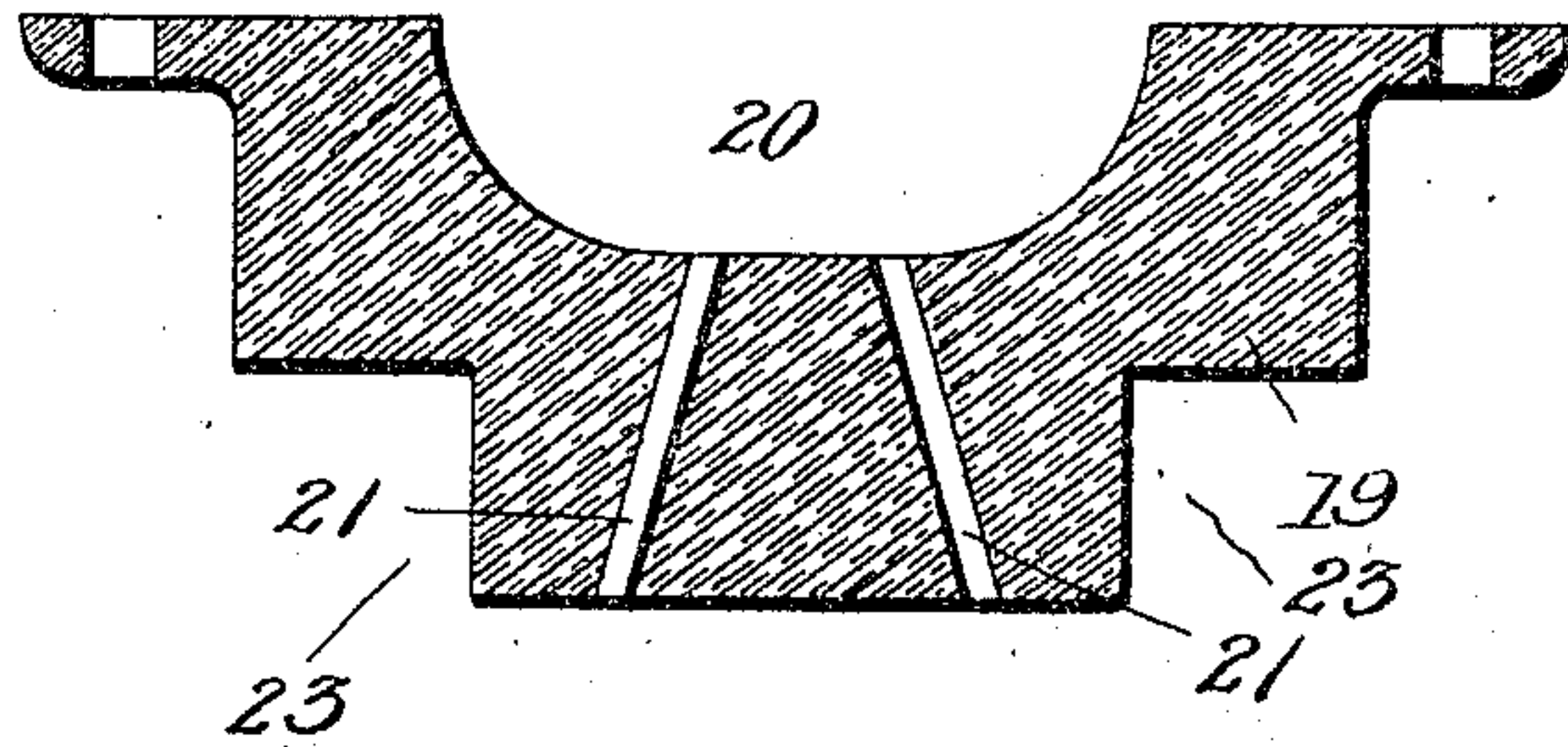


FIG. 6.

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UNITED STATES PATENT OFFICE.

CHARLES N. PRATT, OF ROCHESTER, NEW YORK.

OIL OR THERMAL CUT-OUT.

No. 907,872.

Specification of Letters Patent.

Patented Dec. 29, 1908.

Application filed June 6, 1907. Serial No. 377,564.

To all whom it may concern:

Be it known that I, CHARLES N. PRATT, a citizen of the United States, residing at Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Oil or Thermal Cut-Outs, and do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to electrical switches, and more particularly to that class of such switches that are provided with a fuse, and it has for its object to provide means whereby the arc or flash caused by the melting or destruction of the fuse from an excessive current will be extinguished by oil or other liquid.

Broadly speaking, the invention comprises a box or other receptacle within which the fuse may be submerged in a liquid, as oil.

The receptacle is substantially hermetically sealed and in its preferred form the lid or cover of the receptacle is provided with one portion of the switch whereby the opening or closing of the lid will break or close the switch as the case may be. A vent pipe is preferably provided which communicates with the upper portion of the receptacle and is provided with suitable means for closing it, as a trap, which is adapted to be filled with oil or other suitable liquid.

In the accompanying drawings, which illustrate the invention, Figure 1 is a top plan view of the box containing the switch, showing the cover removed or swung to one side upon its hinges; Fig. 2 is a longitudinal sectional view of the box closed; Fig. 3 is a cross sectional view taken on the line 3—3 of Fig. 2; Fig. 4 is a longitudinal section taken through the switch block on the cover; and Figs. 5 and 6 are perspective detail views of the blades of the switch.

Referring more particularly to the drawings, 1 indicates a box or receptacle which may be of any shape or form, preferably rectangular, with a removable cover, 2. The cover is preferably hinged to the box at one end by means of perforated ears, 3, and pintles, 4. The cover is adapted to be held or locked in its closed position by means of hinge bolts, 5, which are adapted to engage with projections, 6, upon the edge of the cover in the ordinary manner. A suitable packing or gasket, 7, preferably of yielding

material, is placed between the cover and the box for sealing the box. The box and its cover may be formed of any suitable material, preferably of metal or insulating material, and is adapted to contain oil or other liquid, indicated at 8, which fills the box or receptacle nearly to the top.

The receptacle is preferably provided with brackets or arms, 9, by means of which it may be secured in any position, and it is provided at its ends with openings, 10, which are preferably surrounded with internally screw-threaded projections, 11, through which the conductors, not shown, may be inserted. A hollow nut, 12, fits in the projection 11 and is adapted to clamp the forward end of a covering, 13, for the weir between its forward end and the side of the receptacle. The openings, 10, are preferably located directly opposite each other and in alinement with each other at the ends of the box.

Secured to the interior of the box in any desired manner, preferably upon the bottom, is a block, 14, of insulating material, as hard wood. Secured to the ends of the block 14 are terminals, 15, for the conducting wires, each of which is preferably provided with a clamping portion, 16, by means of which the wire or conductor is secured in said terminals by means of a screw, 17. One or more knife blade contacts, 18, are secured to the blocks 15 in any desired manner so as to project forwardly toward the lid or cover of the box. The terminals 15 are located substantially in alinement with the openings 10 in the ends of the box, whereby the conductors may be easily inserted in said terminal blocks after having been passed through the openings, 10.

Secured upon the inner side of the cover is a block 19, of insulating material, as hard wood, which is recessed upon its upper side as shown at 20, and provided with two diverging perforations 21, leading from the bottom of said recess to the lower edge of the block. Each end of the block 19 is recessed upon its lower side as shown at 22, in which is seated contact supports, 23. The distance between the recesses 22 is sufficient to permit the lower portion of the block 19 to pass down between the knife blades, 18, and each contact support, 23, is provided with one or more knife blade contacts, 24, which are adapted to be forced into engagement with the contacts 18, and thereby establish electrical connection when

the cover of the box is closed. The inner edge of one of the contacts 18, where the contacts 24 on the free or swinging end of the cover engage therewith, is preferably cut 5 away as shown at 25.

Projecting through the perforations 21 in the block 19 is placed the fuse, 26, which has its center or doubled portion extending up into the recess 20, and has its free ends 10 connected with the lower portion of the contact supports 23 by means of clamping screws, 27, in the usual manner.

The rear wall of the box is provided with a vertical channel or conduit, 28, which communicates with the interior of the box 15 through a recess 29 formed in the cover by raising a portion of the cover as shown at 30 directly over the partition wall, the edge of the cover being also extended out over the conduit, 28, as shown at 31. The conduit 28 is extended at the lower end as by means of a pipe 32, which is removably secured therein and has its lower end formed into a trap, 33, as by being curved upward 25 or bent into a substantial U-shape the length and size of the trap being sufficient to prevent the seal from being blown out by the explosion caused by the melting of the fuse. The box is also provided with a plug, 30 34, at or near the bottom by means of which the box may be emptied of its liquid contents at any time.

In using a switch as above described, the conductors are connected with the terminal 35 blocks 15 and the fuse is connected with the contact supports 23, while the box is open. The box is then filled with oil, or other suitable liquid nearly to the top, or preferably until it will stand above the upper ends of the 40 perforations, 21, in the bottom of the recess, 20. The cover of the box is then closed which will immediately close the switch by causing the contacts 24 to engage with the contacts 18. The trap 33 is also filled 45 with oil or other liquid and the switch is in complete working order.

If at any time, the current should become so excessive as to melt the fuse, the arc formed at the time of such melting or fusing 50 will be extinguished by the oil or other liquid, and the danger from fire from such flashing of the fuse will be absolutely prevented. Any expulsion of the air that may take place due to the heat developed by the 55 volatilization will be permitted to pass down through the conduit at the rear of the box and be allowed to expand its force or energy through the seal in the trap. As the trap remains closed at all times and prevents the 60 entrance of explosive gases or other mixtures to the interior of the box, as well as permitting the arc gases to escape or to pass out of the box, the switch is peculiarly adapted for use in subways, man-holes, etc., which are 65 liable to have gas collect therein, and as the

presence of water will only more effectively close the trap by increasing the amount of liquid therein, the use of the switch is also peculiarly adapted for places which are liable 70 to be submerged or flooded from excessive water. The sealing of the box also renders the switch peculiarly adaptable for use in places which are subject to overflow.

As above described, it will be seen that the switch is very simple and effective as it can 75 be quickly secured in any desired position by means of the brackets, and as quickly removed if desired. The fuse can be easily inserted with or without removing the block from the cover, the recess in its upper edge 80 permitting of the latter, and by means of the gasket and packing, and the hinge bolts, an absolutely tight joint can be effected between the cover and the box. The size and dimension of the box and other accessories 85 can be made in accordance with the capacity of the current to be handled, thereby adapting it for use upon all lines or conductors, irrespective of their capacity. A sufficient portion of the fuse extends above the surface 90 of the liquid in the box to permit of its being fused in the air while the presence of the oil or liquid extinguishes the arc formed thereby. The opening of the box automatically 95 opens the switch and thereby removes all danger of accidental contact with a completed circuit, and the box can be formed of any desired material as treated wood, porcelain, glass, or other insulating material of 100 high resistance. The incoming cables or conductors can be provided with insulation of any kind that will not be affected by the oil or liquid within the box, and when the box is used overhead, the seal could be omitted.

The openings 10 are made oil tight in any 105 desired manner but may be so rendered as follows: Within the projection 11 is a packing 35 which may be of lead or similar metal bearing against the flange 36 around the opening 10. Within said packing, said 110 opening and in the tube 12 is placed a plug 37 of insulating material surrounding the conductor 38. Abutting against the outer end of the plug 37 is the insulating covering 39 of 115 the conductor 38, over this insulation is the usual lead pipe 40 of an armored conductor, the pipe 40 and the tube 12 being secured together by a wipe connection 41.

Having described my invention, I claim:

1. In a switch, a receptacle adapted to contain a liquid and provided with means for 120 making and breaking a circuit under the liquid when the lid is actuated, and a conduit communicating with the interior of the receptacle above the surface of the liquid the 125 outer end of the conduit being yieldably sealed.

2. In a switch, a receptacle adapted to contain a liquid, one wall of the receptacle being provided with a conduit and the lid be- 130

ing provided with a recessed portion for establishing communication between the conduit and the upper portion of the interior of the receptacle, means for making and breaking a circuit within the receptacle, and fluid means for sealing the lower end of said conduit.

3. In a switch, a receptacle adapted to contain a liquid, means for making and breaking a circuit in said receptacle, a conduit connecting with the space above said liquid whereby a passage is provided for the expulsion of the air from the receptacle, said conduit leading downwardly and being provided with a U-shaped portion adapted to hold a liquid and to form a yieldable seal.

4. In a switch a receptacle adapted to contain a liquid, means for making and breaking a circuit within the receptacle, one wall of the receptacle being provided with a vertical conduit and the cover of said receptacle being recessed and extending laterally over said conduit to establish communication between

the conduit and a portion of the interior of the receptacle above the liquid, a pipe extending from the lower end of said conduit and having its lower end upturned to form a trap, said trap being adapted to hold a liquid.

5. In a switch a receptacle adapted to contain a liquid, means for making and breaking a circuit within said receptacle, one wall of said receptacle being provided with a vertical conduit and the cover of said receptacle being recessed and extending laterally over said conduit to establish communication between the conduit and a portion of the interior of the receptacle above the liquid, an outwardly yieldable valve communicating with the lower end of said conduit.

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

CHARLES N. PRATT.

Witnesses:

GEORGE HEARN,
E. E. LAZIER.