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Patented Aug. 13, 1901.

V. CROIZAT.

GAS LAMP LIGHTING OR EXTINGUISHING APPARATUS.

(Application filed Mar. 1, 1900.)

(No Model.)

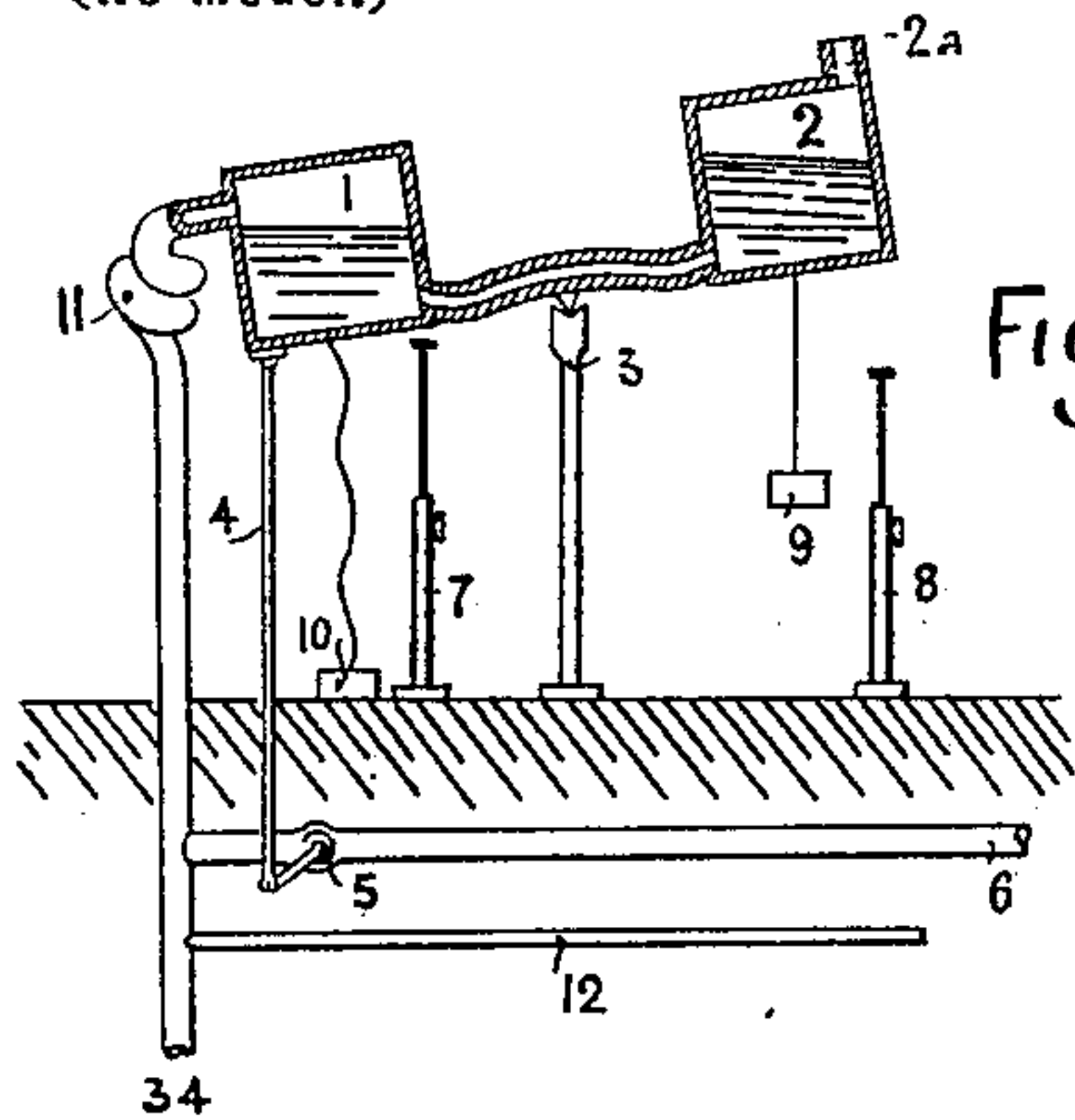


Fig. 1.

Fig. 2.

Fig. 3.

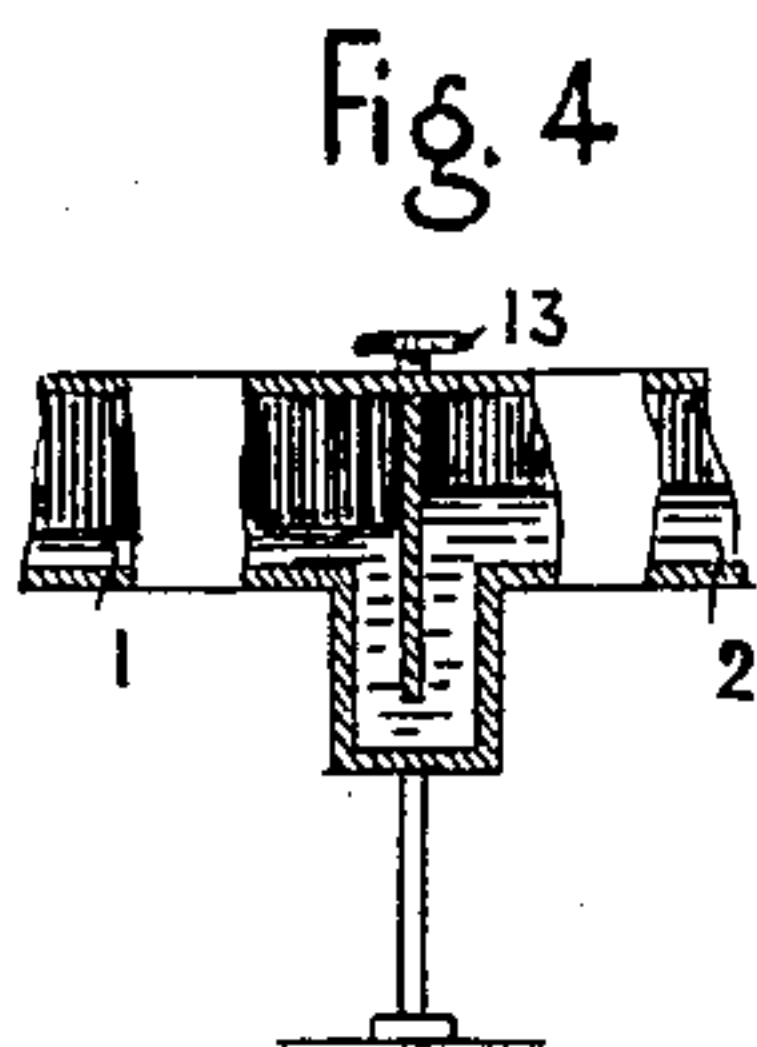
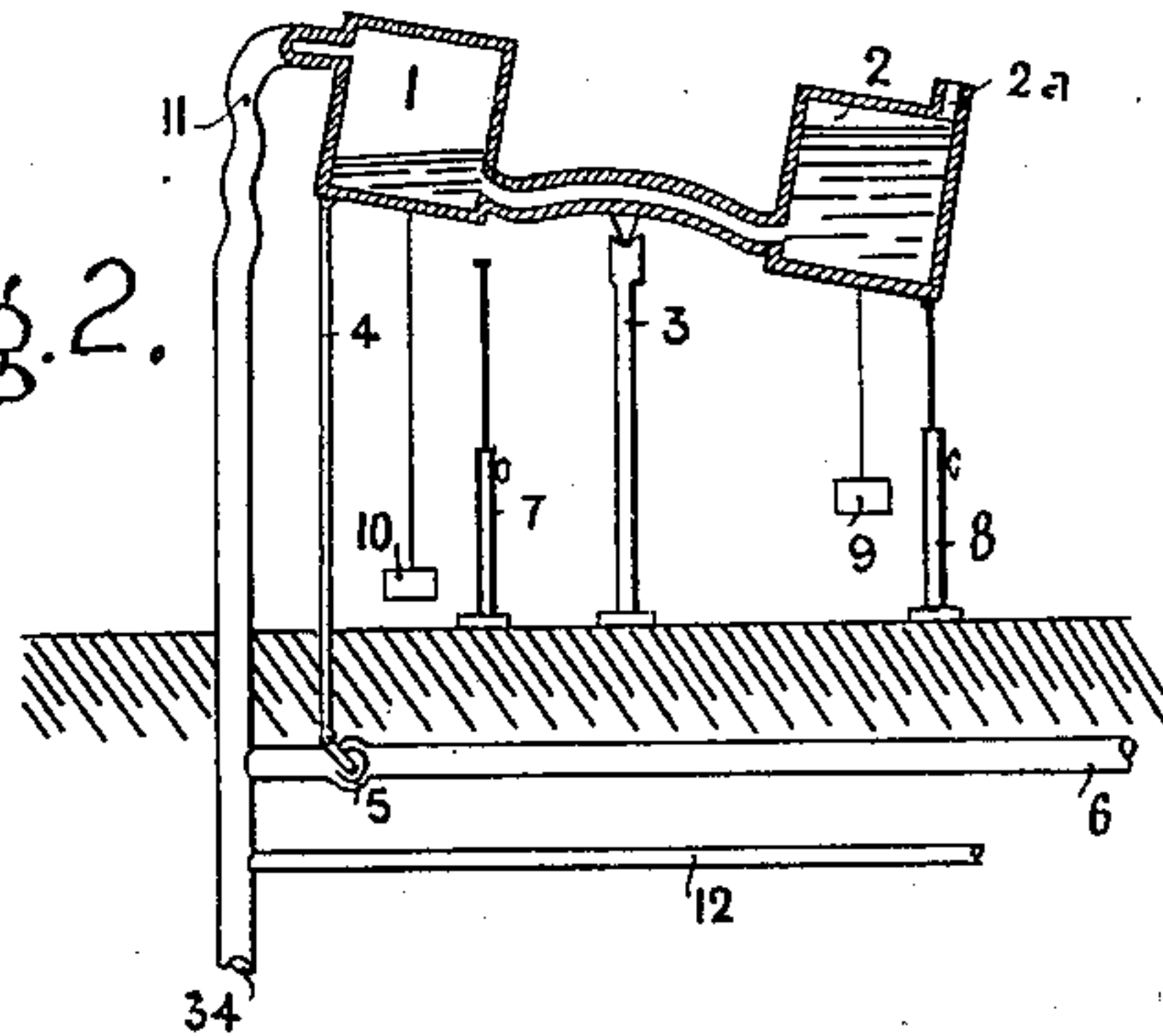


Fig. 4.

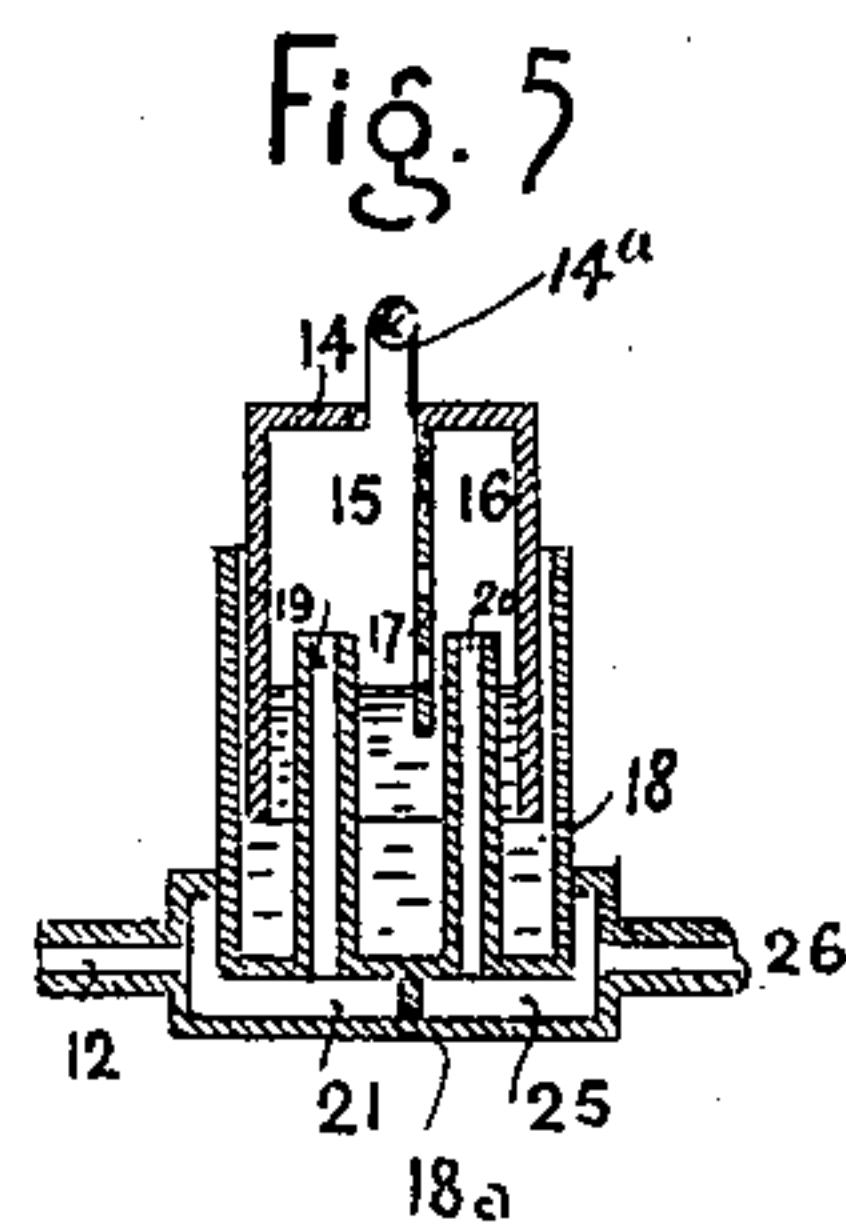


Fig. 5.

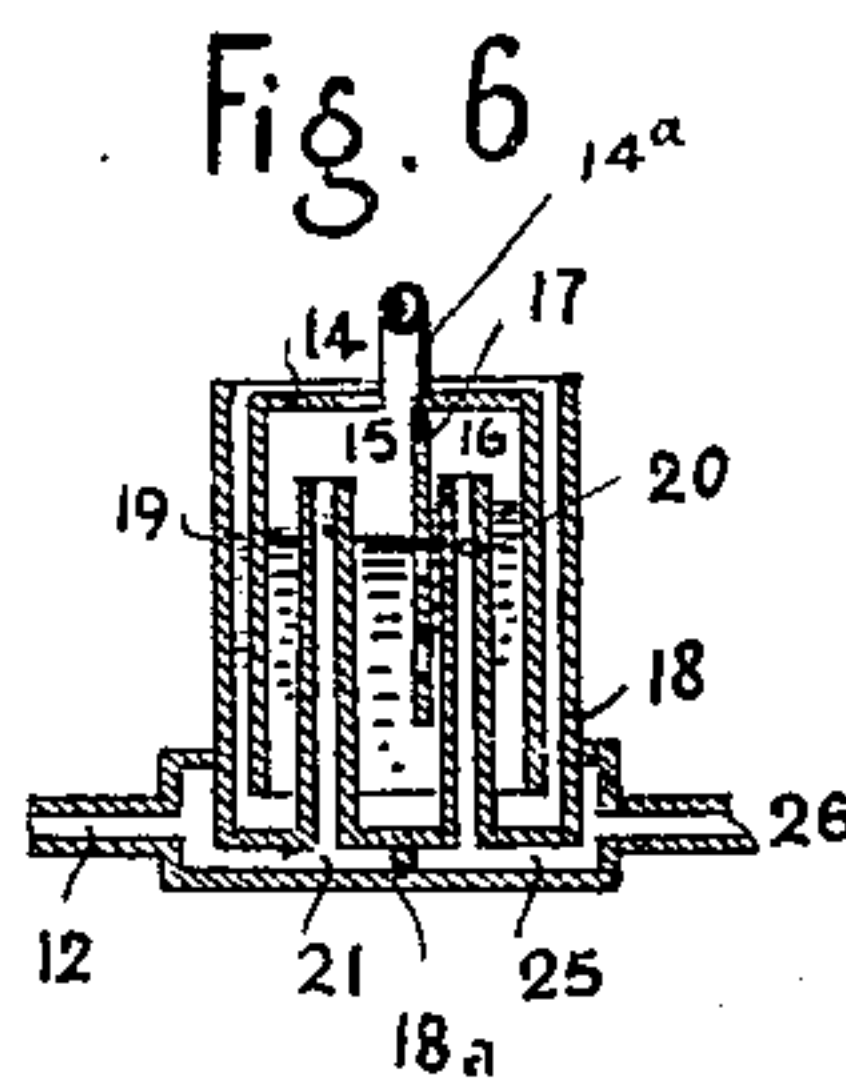


Fig. 6.

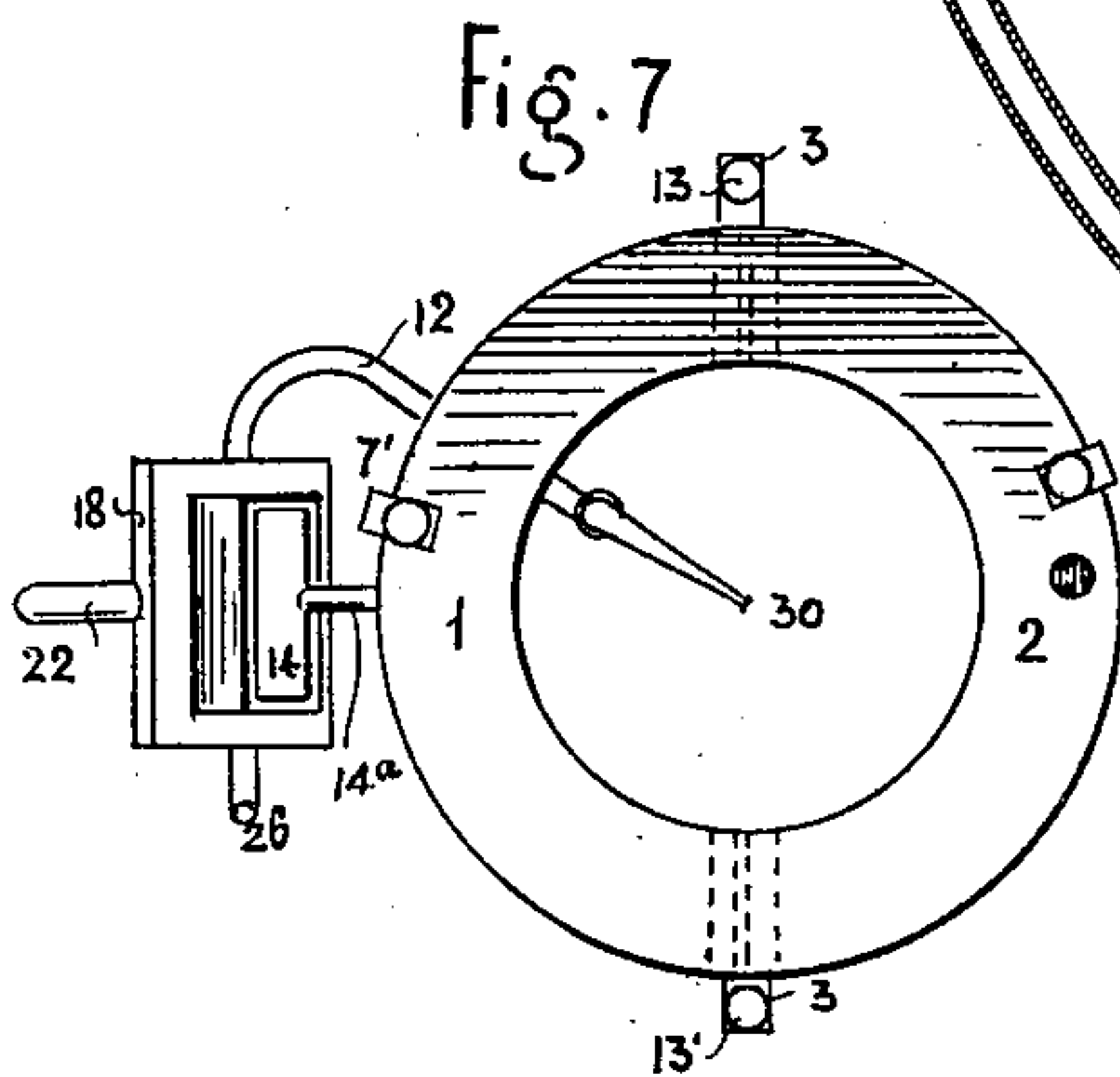


Fig. 7.

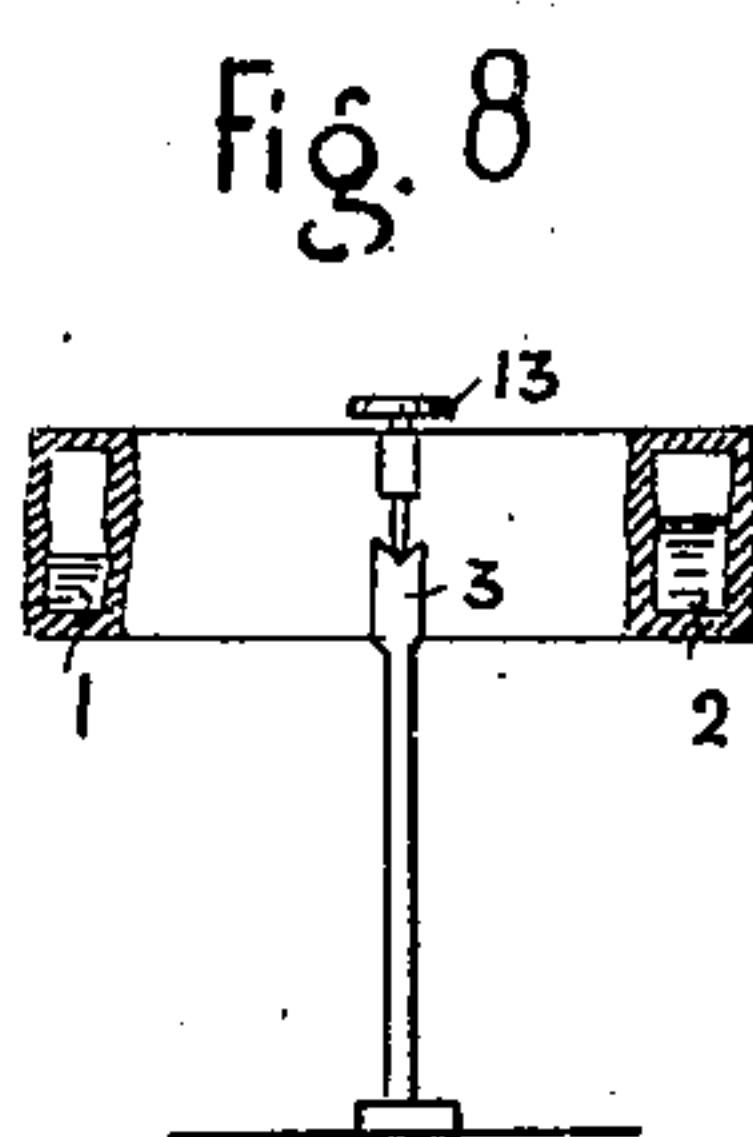
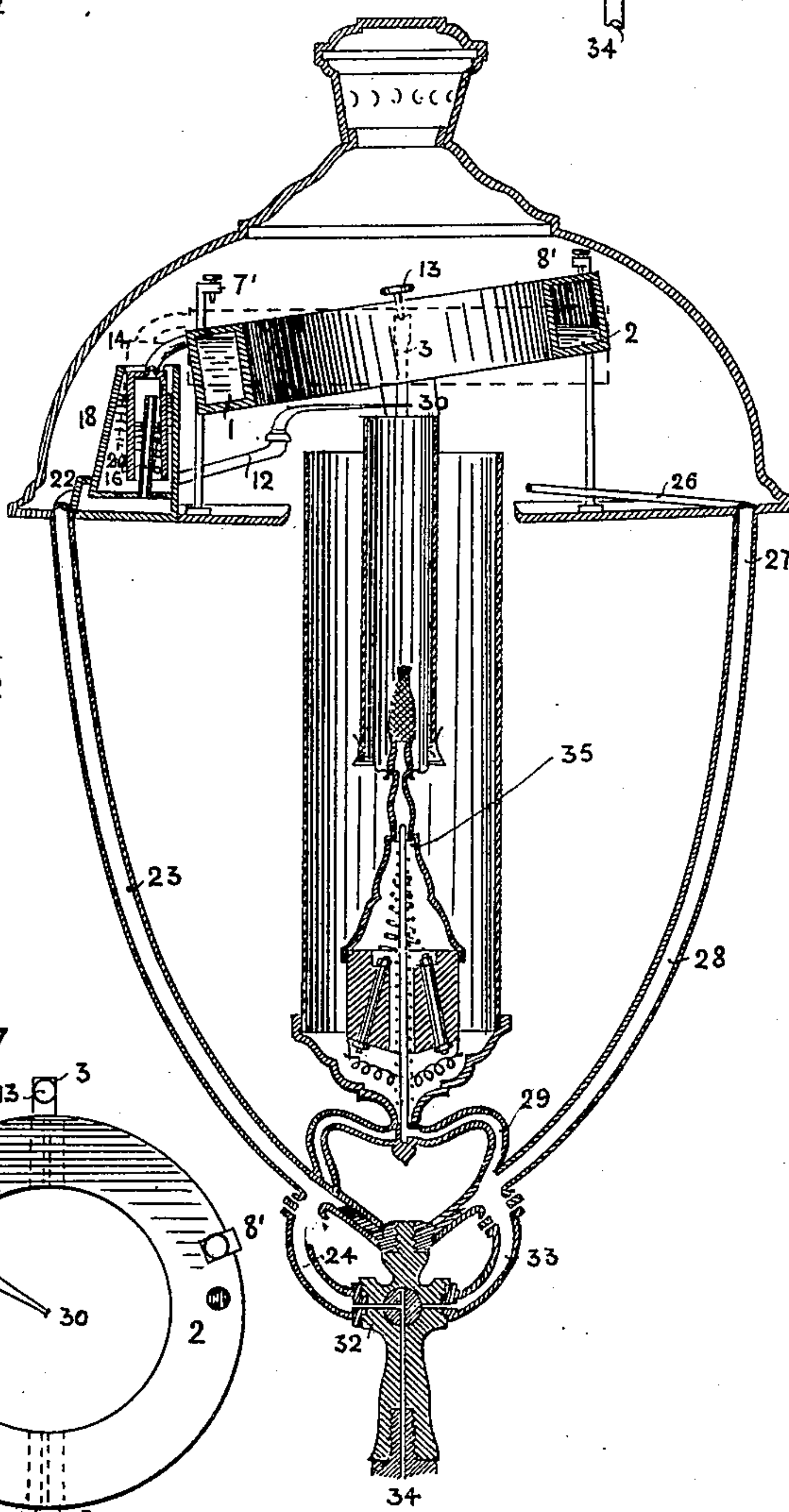


Fig. 8.



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VITTORIO CROIZAT, OF TURIN, ITALY.

GAS-LAMP LIGHTING OR EXTINGUISHING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 680,568, dated August 13, 1901.

Application filed March 1, 1900. Serial No. 6,963. (No model.)

To all whom it may concern:

Be it known that I, VITTORIO CROIZAT, a subject of the King of Italy, residing at Turin, in the Province of Turin, Italy, have invented certain new and useful Improvements in Gas-Lamp Lighting or Extinguishing Apparatus; and I do hereby 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.

Figure 1 is a sectional side elevation showing diagrammatically an apparatus embodying the principle of my invention, the parts shown in the position they assume when the lamp is not lighted. Fig. 2 is a similar view with the parts in the position they assume for the lighting of the lamp. Fig. 3 is a vertical section of a lamp embodying my invention, the apparatus being of modified form. Fig. 4 is a cross-sectional view showing a fragment of a compartmented tilting annulus, forming part of the apparatus shown in Fig. 3. Fig. 5 is a vertical section of a bell and cup employed in connection with the apparatus shown in Fig. 3, these parts being in section on a line taken at right angles to the section illustrated in Fig. 3. Fig. 6 is a view similar to Fig. 5, but showing the parts in a different position. Fig. 7 is a plan view of the tilting annulus and the parts illustrated in Figs. 5 and 6, and Fig. 8 is a detail of one of the fulcrums of the tilting annulus.

This invention relates to means of effecting from an office or station the lighting and extinguishing of street or other ranges of gas-lamps. The apparatus is worked by varying the pressure in the gas-mains and is so arranged that when the pressure is raised beyond a certain limit the lamps become lighted and when the pressure is lowered to a certain extent they are extinguished. The ordinary pressure is not interfered with except during short periods, when the lighting and extinguishing are effected. Thus there are three distinct pressures by which the devices are controlled. These are the ordinary gas-pressure maintained while the lamps are to be kept lighted, a lower pressure, which results in extinguishing the lights at the main burners, and a higher pressure than the ordinary gas-pressure whereby to light the main burn-

ers. At each lamp there is a small lighting-flame always burning, and the raising of the pressure opens passage for gas to the main burner, which is kindled by the lighting-flame, while the lowering of the pressure closes the passage.

Figs. 1 and 2 of the accompanying drawings show diagrammatically how the apparatus acts, and the other figures show a practical application of the invention to a lamp.

As shown in Figs. 1 and 2, two vessels 1 and 2, communicating with each other at the bottom, are poised on a fulcrum 3, the vessel 1 communicating by a flexible pipe 11 with the gas-main and the vessel 2 being open to the atmosphere, as by a vent 2^a, or subject to any other approximately constant pressure. When the pressure in the gas-main is increased, liquid passes from 1 to 2, causing the vessels to rock over to the position shown in Fig. 2. The difference of level between the surfaces of the liquid in the two vessels represents and corresponds to the difference between the pressures in the same vessels. Supposing said difference of level to be as shown at Fig. 1 when the lamp is extinguished, the liquid in 2 being higher than in 1, if now the pressure in the gas-main, and consequently in the vessel 1, increases while the pressure in the vessel 2 remains constant the level of the liquid will rise still more in the vessel 2—that is, liquid will pass from 1 to 2, causing, when reaching a certain limit, the vessel to rock over to the position shown in Fig. 2. When the gas-pressure is lowered, the difference of level between the two vessels will correspondingly diminish, the liquid descending in the vessel 2 and rising in 1, and thus water passing from 2 to 1 until the weight in 1 is so increased as to cause the vessel to rock back in the former position. It is obvious that the operation of the apparatus results only from the difference of the pressures in the two vessels 1 and 2 and not from the absolute value of said pressure. As a rule the pressure in the vessel 1 will never be lower than the atmospheric pressure, as it is known that the pressure in gas-mains must always be higher than the atmospheric pressure. The vessel 1 is linked by a rod 4 to the lever of a stop-cock 5, which controls the passage of gas by the pipe 6 to the lamp.

Thus by the raising of the gas-pressure the cocks 5 are opened and the lamps are lighted and by the lowering of the pressure the cocks 5 are closed and the lamps are extinguished.

5 The ordinary variations of service-pressure are not sufficient to move the vessels 1 and 2 from the one position to the other. It requires for that purpose a change of pressure sufficient to overcome the effect of the weight

10 of the vessels and their contents acting with the leverage, which is determined by the position of the center of gravity beyond the vertical line of the pivot 3, and thus once the vessels have been rocked to the one position

15 or the other they remain so until there is change of pressure sufficient to overcome the weight acting at the leverage due to their position. The weight and leverage may be adjusted by varying the quantity of liquid

20 in the vessels, the positions of stops 7 and 8, and of the fulcrum 3, as well as by weights 9 and 10. I have shown a flexible pipe 11 connecting the vessel or chamber 1 with the gas service-pipe 34. It is to be remarked

25 that the weight 10 acts only as an overcharge of the vessel 1 when the device is in the position shown at Fig. 2. The reason is that this weight is intended to counterbalance in part the excess of liquid passed from 1 to 2.

30 It must also be remarked that a part of this excess of liquid must not be counterbalanced, as it is necessary to allow a certain variation of the pressure to take place without causing the vessels to rock back. The weights 9 and

35 10 may be omitted by properly adjusting the position of stops 7 and 8 and of the fulcrum 3. In the diagrams, Figs. 1 and 2, 12 indicates the pipe which supplies the small lighting flame, being independent of the cock 5.

40 As shown in section in Fig. 3 and plan, Fig. 7, the two vessels 1 and 2 are made in one annular piece adjustable on two fulcra 3 by setting-screws 13 13' and having above it adjustable screw-stops 7 and 8. The annular piece

45 is divided by partitions on both its sides into the two compartments 1 and 2, which communicate with each other at some depth under the partition, as shown in section in Fig. 4. The compartment 1 has extending from

50 its upper part a pipe and a bell 14, divided, as shown in section in Figs. 5 and 6, into two compartments 15 and 16 by a partition 17, having holes through its lower but not through its upper part. The bell is immersed

55 in liquid in a vessel 18, having two tubes 19 and 20, leading, respectively, from the compartments 15 and 16. The tube 19 communicates by passages 21 and 22 and pipes 23 24 and cock 32 with the gas service-pipe 34, so

60 that gas from the service-pipe can pass into the compartment 15 and thence into the compartment 1. It will be seen from Figs. 5 and 6 that the partition 17 is to one side of the center of bell 14, and similarly that the partition 18^a, between the compartments 21 and

65 25 of cup 18, is to one side of the center. This is of no moment except that it permits the pipe 14^a, leading from bell 14, and the pipe 22 to be located in a central position. The tube 20 communicates by passages 25 and 26

70 and pipes 27, 28, and 29 with the supply-passage to the main burner 35. From 21 leads the pipe 12, supplying the lighting-flame 30. When the compartments 1 and 2 are in the position shown in Fig. 3, 1 being down, then

75 the bell 14, as shown in Fig. 6, is so deeply immersed in the liquid in 18 that no gas can pass from 15 to 16, and consequently none passes by 20 to supply the lamp, which in that case is extinguished; but when the compart-

80 ments 1 and 2 take the position indicated by dotted lines in Fig. 3 and shown in section in Fig. 8 the bell 14 being raised, as shown in Fig. 5, then gas passes from 15 through holes of the partition 17 and the tube 20 to

85 supply the lamp, which is then kindled by the lighting-flame 30. A three-way cock 32 is provided for supplying the lamp directly should the kindling and extinguishing apparatus be out of action.

90 As an example, it can be added that in some cities the ordinary pressure of the gas is of about forty millimeters of water, (excess over atmospheric pressure.) Said pressure is raised in the evening during the lighting of

95 the street-lamps till about sixty millimeters. After the lighting of the street-lamps the pressure is allowed to fall again to forty millimeters, and such it remains the whole night.

100 In the morning during the extinguishing of the lamps the pressure is lowered to about twenty millimeters and then is raised again to forty. The working of the apparatus is then as follows: During the day the apparatus is

105 in the initial position, as shown in Fig. 1, the difference of level of the liquid in the two vessels being that corresponding to the ordinary pressure of forty millimeters. When the pressure increases, said difference of level be-

110 comes greater—that is, liquid passes from 1 to 2; but if the stop 7 is placed sufficiently low under the fulcrum 3, thus allowing more water into the vessel 1, or if the vessel 1 is otherwise charged with weight, the result is

115 obtained that the liquid passing into the vessel 2 will not make the weight of 2 exceed the weight of 1 until the pressure reaches the limit of sixty millimeters. When in the evening, as before stated, said limit is reached,

120 the vessels rock into the position of Fig. 2, thus causing the lamps to be lighted. The difference of level in the two vessels will be then that corresponding to sixty millimeters of pressure; but it will soon diminish when the pressure diminishes, liquid passing thus

125 back from 2 to 1. Now if the stop 8 is placed sufficiently low under the fulcrum 3, thus allowing more water to flow into the vessel 2, or if the vessel 2 is otherwise charged with weights, the result is obtained that the liquid

130 passing back from 2 to 1 will not make the weight of 1 exceed the weight of 2 until the difference of level of the liquid in the two vessels is reduced to that corresponding to a

pressure of twenty millimeters. When in the morning, as above stated, said limit of pressure is reached, the vessels rock back into the position shown in Fig. 1, thus causing the lamps to be extinguished. The disposition of set-screws 11, 7, and 8 (shown at Fig. 3) permits very easily and promptly to adapt the apparatus to work under different limits of pressures.

Having now particularly described and ascertained the nature of this invention and in what manner the same is to be performed, I declare that what I claim is—

1. The combination with a gas-lamp having a main burner and a lighting-burner, of connections for supplying gas to said burners, a receptacle mounted to rock and a body movable in said receptacle to shift the center of gravity and thereby rock the receptacle and means for controlling the supply of gas to the main burner by the movements of the rocking member.

2. A gas lighting and extinguishing apparatus comprising a burner, means for lighting the burner, a pipe for supplying gas to the burner and means for controlling the passage of gas from the supply-pipe to the burner, said controlling means including a cut-off, a member movable to positions to open and close the cut-off, said member resisting and remaining unmoved under the normal working gas-pressure, a gas-pressure in excess of the normal serving to move the said member to one of said positions and a gas-pressure below the normal serving to bring the said member to the other of said positions.

3. Means for controlling the flow of gas to gas-burners, comprising a tilting controlling member carrying a shifting body, and a burner-passage, controlled by the tilting member, the said member moving in one direction by a gas-pressure in excess of the normal and returning under a gas-pressure reduced below the normal, the normal gas-pressure serving to maintain the tilting mem-

ber in the position given to it by the excessive pressure.

4. Gas-lamp-controlling devices, and means in connection therewith, for controlling the said devices, said means including a compartmented tilting receiver adapted to contain liquid, one of the compartments being in communication with the gas-supply and an excess of gas-pressure serving to displace the liquid in said compartment, and thereby tilt the receiver from its normal position, the said receiver returning to its initial position under a reduction of the pressure below the normal.

5. The combination with a gas-lamp, of a tilting member, a movable body therein, a bell in connection with said tilting member, a cup into which said bell dips to seal the same, and connections leading from said cup to the gas-supply and the lamp respectively said bell controlling the communication of the supply and lamp connections, the tilting member operating by a variation of pressure in the gas-supply.

6. The combination in a gas-lamp of a main and an igniting burner, controlling devices including a cup, a partition dividing the cup into compartments, a connection between one of said compartments and the gas-supply and between said compartments and the igniting-burner, connections between the other compartment and the main burner, a bell having a liquid seal in the cup and controlling the communication between the two compartments of the cup, and means movable by an excessive pressure of gas for changing the depth of the bell's immersion in its seal and establishing communication between the compartments of the cup.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

VITTORIO CROIZAT.

Witnesses:

SERGE DONATI,

HY. C. WILLIAMS.