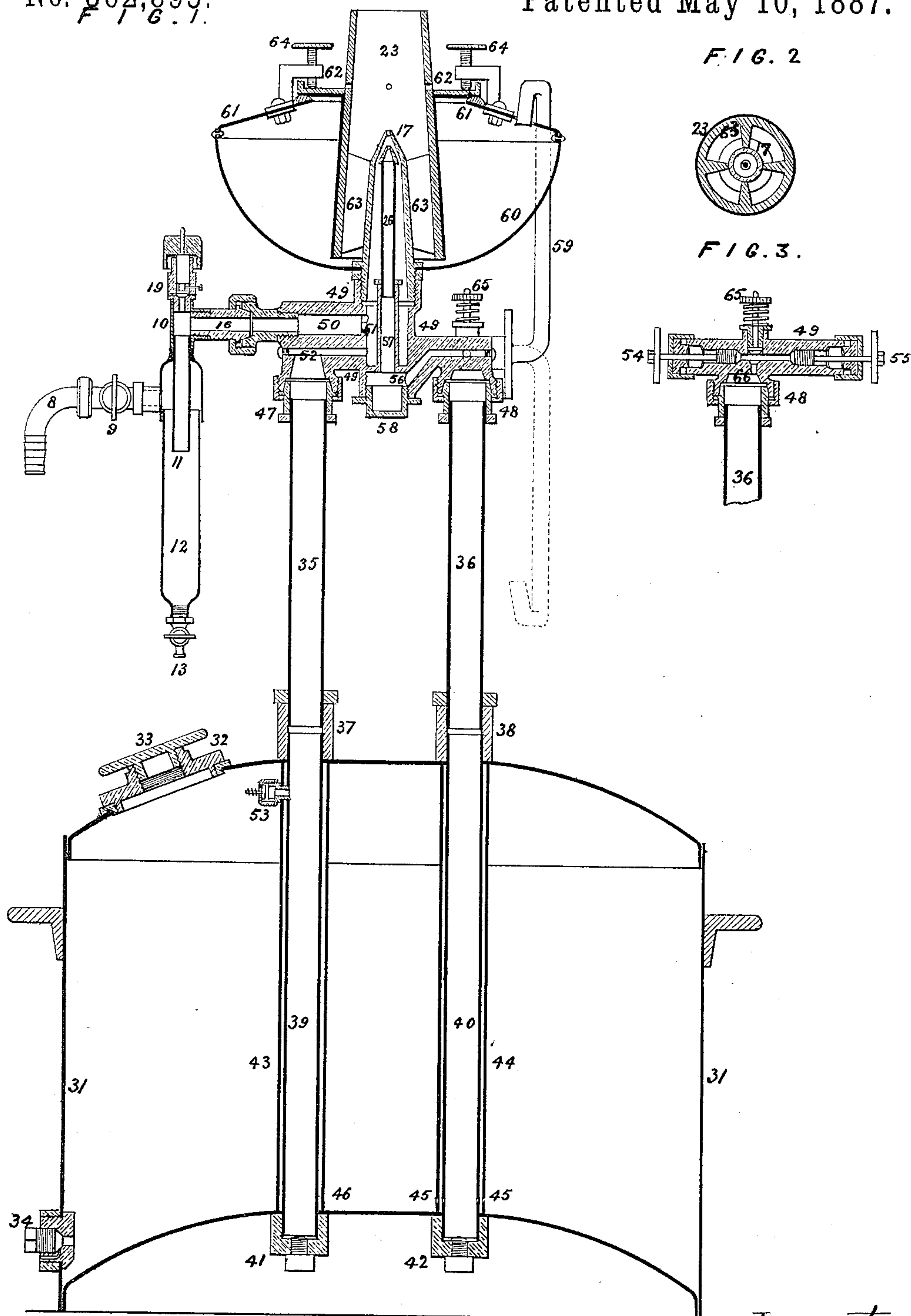


(No Model.)

J. LYLE.
SIGNAL LAMP.

No. 362,895.
F. 16. 1.

Patented May 10, 1887.



Witnesses.
William W. Conner.
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UNITED STATES PATENT OFFICE.

JAMES LYLE, OF PAISLEY, COUNTY OF RENFREW, SCOTLAND.

SIGNAL-LAMP.

SPECIFICATION forming part of Letters Patent No. 362,895, dated May 10, 1887.

Application filed July 15, 1886. Serial No. 208,065. (No model.) Patented in France November 3, 1885, No. 172,018; in England May 18, 1886, No. 6,682; in New South Wales June 18 and September 28, 1886, No. 1,931; in Belgium June 22, 1886, No. 73,575; in Italy June 30, 1886, No. 20,142; in India August 4, 1886, No. 135; in Victoria August 9, 1886, No. 4,661; in Spain September 25, 1886, No. 6,085, and in Austria-Hungary October 7, 1886, No. 30,197 and No. 37,413.

To all whom it may concern:

Be it known that I, JAMES LYLE, a subject of the Queen of Great Britain and Ireland, and a resident of Paisley, county of Renfrew, Scotland, have invented certain Improvements in Spray-Lamps (which has been patented in France November 3, 1885, No. 172,018; in England May 18, 1886, No. 6,682; in New South Wales June 18 and September 28, 1886, No. 1,931; in Belgium June 22, 1886, No. 73,575; in Italy June 30, 1886, No. 20,142; in India August 4, 1886, No. 135; in Victoria August 9, 1886, No. 4,661; in Spain September 25, 1886, No. 6,085, and in Austria-Hungary October 7, 1886, No. 30,197 and No. 37,413,) of which the following is a specification.

The invention relates to lamps constructed for burning oil in the form of spray produced by the action of compressed air upon the oil, a large and brilliantly illuminating flame being obtained in such lamps from oil of a very inexpensive kind. Such inexpensive oil is, however, unfortunately always in a very impure condition, having generally drops of water mingled with it, as well as earthy and other solid impurities, which interfere with the working of the lamp. By causing interruptions in the flow of the oil at the burner or nozzle, from which the spray is ejected, drops of water or other impurities make the flame go out, and thereby produce serious inconvenience; and it is defects of this kind which it is the principal object of the present invention to remedy, improvements in various details being, however, also included.

In my improved lamp, which is shown in the accompanying explanatory drawings, the inconvenience of interruption of the flame is sought to be remedied by providing for the maintenance of a constant auxiliary flame close to the main jet of spray, such auxiliary flame instantly reigniting the main flame, should it be momentarily put out through interruption in the flow of the oil.

Figure 1 is a vertical section of the entire apparatus, excepting the apparatus for compressing the air, and which may be of any convenient kind. Fig. 2 is a horizontal section as taken across the burner-cup 23, and Fig. 3 is a transverse vertical section of a part of the valve details.

The apparatus shown in Fig. 1 comprises a closed tank or vessel, 31, for containing the oil, and which is fitted with a comparatively-large screw-plug, 32, for giving access for cleaning the interior, while for merely filling in oil the large plug is fitted with a small screw-plug, 33. The bottom of the vessel 31 is made higher in the middle, so that sedimentary matters may tend to pass to the sides, and a screw discharge-plug, 34, is fitted at one point, there being formed in connection with this plug a small passage, which is opened by slightly unscrewing the plug, and which serves for ascertaining if there is water at the bottom of the oil and for letting it out.

The upper parts of the apparatus are carried by two tubes, 35 36, which may be of any convenient length, and which have their lower ends fixed to the vessel 31 by internally-screwed coupling-rings 37 38, supplemented by jam-nuts, and screwed upon the upper ends of lower tubes, 39 40, projecting through the top of the vessel. The tubes 39 40 also project through the bottom of the vessel 31, and are there held by external screw-caps, 41 42, which are themselves fitted with screw-plugs to give access to instruments for cleaning the tubes 39 40 and 35 36. Inside the vessel 31 larger tubes, 43 44, are placed outside of the tubes 39 40, to serve as struts when tightening the screw-caps 41 42 and the screw coupling-rings 37 38 upon the ends of the tubes 39 40. Compressed air has access by one line of tubes, 35 39, to the vessel 31, and the oil is by the compressed air made to ascend the other line of tubes, 40 36, the oil entering these tubes by holes 45 near the bottom, while the compressed air issues from holes 46 near the bottom of the tubes 39 43 on the side facing the oil-ascension tube, so that the current produced by the jet of air may tend to move away any sedimentary matter that may be lodging near the oil-inlet holes 45.

The upper ends of the air-tube 35 and oil-tube 36 have fixed to them, by screw-couplings 47 48, a casting, 49, formed with various passages and fitted with various valves and connections, and having projecting up from its upper part an outer nozzle, 17, and an inner nozzle, 26, from which the compressed air and oil issue. The compressed air, being

led to the apparatus by an inlet-pipe, 8, fitted with a stop-cock, 9, enters the upper part of a vessel, 12, in which it can deposit any drops of moisture brought over by it, this vessel 5 being fitted with a discharge-cock, 13, for periodically removing water. A tube, 11, dips down into the moisture-collecting vessel 12 from a piece, 10, and the air passes up this tube 11 and through a passage, 16, into a passage, 50, formed in the casting 49. Directly 10 above the top of the tube 11 there is fitted a small escape-valve, 19, loaded to suit the desired pressure of air and allowing some of the air to escape when its pressure is too high. 15 The air-inlet passage 50 in the casting 49 communicates with an annular space, 51, formed in the casting, and which is in communication with the annular space between the two nozzles 17 26, and this annular space also commu- 20 nicates, by a passage, 52, with the top of the tube 35, leading down to the oil vessel or reservoir 31. In this way the compressed air not only supplies the jet from the nozzle 17 for throwing the oil into spray, but also presses 25 on the oil in the vessel 31, so as to raise it up to the burner. The air entering the vessel 31 rises through the oil to the top of it, and when the supply stop-cock 9 is shut off would continue to press on the oil and force it up when 30 not required, were it not that a small by-pass valve, 53, is fitted to the air-tube 39 near the top of the vessel. This valve is arranged to open inward toward the tube when the pressure inside the vessel is greater than in the tube, 35 as is the case when the supply of compressed air is shut off, the air then escaping through the nozzle 17.

Above the part where the oil-ascension tube 36 is connected to the casting 49 there is formed 40 a cross-passage, which is shown in Fig. 3, and which is fitted with two screw-plug valves, 54 55, having their spindles passed through stuffing-boxes. One, 54, of these valves gives access to a passage, 56, Fig. 1, by which the oil 45 can reach a central vertical passage, 57, leading up to the inner nozzle, 26. A screw cup-shaped plug, 58, is fitted to the bottom of the space below the central passage, 57, and gives access for cleaning, while sedimentary matter can 50 deposit in the cup and be removed with it. The other screw-plug, 55, gives access to a branch tube, 59, which is jointed to the casting 49 and serves for supplying an oil-dish, 60, fixed so as to surround the burner-nozzles 26 55 17 and burner cup or cone 23.

The oil-dish 60 is provided for the purpose of maintaining a constant auxiliary flame for reigniting the main flame in the event of its going out from any cause. The dish 60 is made 60 with an annular cover, 61, and the burner cup or cone 23 is entered down through the center of it, a flange, 62, formed on the cone, resting on the annular cover and closing the opening round the cone. The burner cup or cone 23 is 65 made with an open bottom, being supported in a proper position concentric with the burner-nozzle 17 by means of radial feathers 63,

formed on its inside. Screws 64 in small swiv- eling brackets are provided for fixing the flange 62 of the cone to the annular cover 61 of the oil-dish 60. The oil in the dish 60 has 70 access at the bottom to the interior of the cone 23, and, becoming heated by the heat communicated from the main flame to the cone, is vaporized at its surface. The vapor becomes ignited and maintains a small auxiliary flame 75 round the nozzle 17, which effectively serves the desired object of reigniting the main flame when interrupted from any cause. The outside of the cone 23 is, by preference, coated with asbestos or other suitable non-conduct- 80 ing substance, as indicated by the thick black lines, so as not to communicate too much heat to the oil in the outer part of the dish 60.

In the cross-passage shown in Fig. 3 there is fitted a small valve, 65, with its stem pass- 85 ing out and having a small spring applied to it. When this valve 65 is depressed, it closes a passage, 66, leading from the top of the oil-tube 36 into the cross-passage, and thereby stops the flow of oil. The reignition of the 90 main flame can at any time be tested by momentarily closing this valve 65, and thereby interrupting the flow of oil. The valve 65, however, serves another purpose which is of great value. It can be used to make the lamp 95 give flash-signals, and when it is intended to use it for that purpose in situations where it may be inconvenient to manipulate the valve 65 directly, any convenient arrangement of wires or cords and levers or other suitable gear 100 may be provided for acting on the valve from a greater or less distance.

In the drawings the spray-lamp is shown as arranged for projecting the jet of spray and flame in a vertical direction. It may, how- 105 ever, when desired, be arranged to project the flame in an inclined or even horizontal direction. When the lamp is arranged to give a horizontal or more or less inclined flame and is to be provided with the auxiliary reignit- 110 ing flame, the dish or vessel 60 must be formed or fixed at the lower side and be made of a suitable shape. There must at the same time be provided a cup into the bottom of which the oil will have access from the vessel 60, (in- 115 stead of into the bottom of the cone 23,) and the open top of this cup should be immediately under the main jet or flame just where that jet is issuing from the nozzle 17.

What I claim is— 120

1. The combination of parts forming an im- proved spray-lamp, and consisting of a com- bustion-cone having within it an outer nozzle for compressed air, inclosing an inner concen- 125 tric nozzle for oil, and having surrounding it a dish to contain oil, the bottom of the cone being open to admit oil to the interior, where it may be vaporized, and maintain a constant auxiliary flame for reigniting the main flame when required, substantially as hereinbefore 130 described.

2. The combination, with the main parts of a spray-lamp, of a dish for oil surrounding

the burner-nozzles and combustion-cone arranged for maintaining a constant auxiliary flame, and a spring-valve arranged for momentarily stopping the flow of oil to the main flame for the purpose of making flash-signals, substantially as hereinbefore described.

3. The improved oil tank or vessel fitted with one tube admitting compressed air, and with a second tube for the ascension of the oil, both tubes having perforations near the bottom, and being fixed by screw-caps on their bottom ends projecting through holes in the bottom of the vessel and by screw coupling-rings on their upper ends projecting through holes in the top of the vessel, and with outer

strut-tubes between the top and bottom of the vessel, substantially as hereinbefore described.

4. The combination of the oil-vessel, the burner, a tube for admitting compressed air to the vessel and the burner, and a by-pass valve, 53, in the air-tube, and an oil-tube from the vessel to the burner, as and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES LYLE.

Witnesses:

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DAVID FERGUSON.