

P. BERNARD AND M. BARBÉ.
 APPARATUS FOR LIGHTING AND EXTINGUISHING GAS BURNERS OF STREET LAMPS.
 APPLICATION FILED JAN. 31, 1920.

1,422,249.

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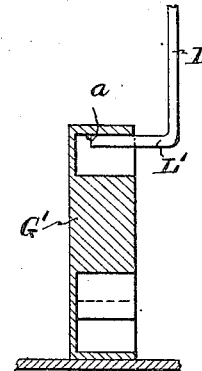
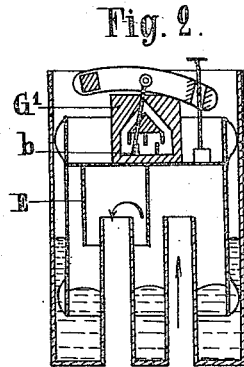
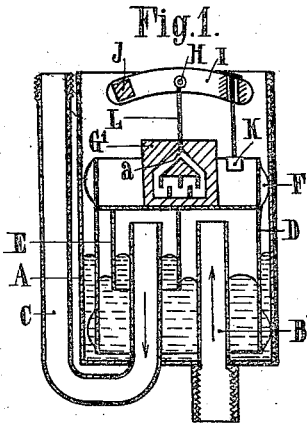


Fig. 3.

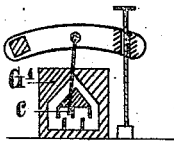


Fig. 4.

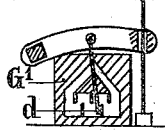


Fig. 5.

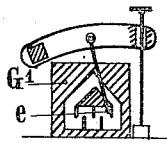


Fig. 6.

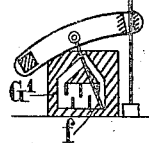


Fig. 7.

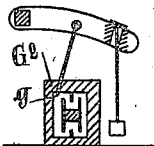


Fig. 8.

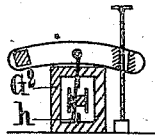


Fig. 9.

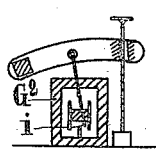


Fig. 10.

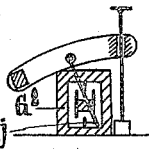


Fig. 11.

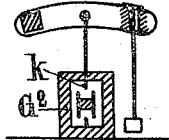


Fig. 12.

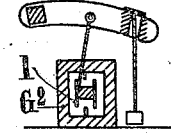
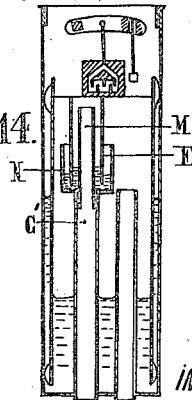


Fig. 14.



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PAUL BERNARD, OF BOULOGNE-SUR-SEINE, AND MAXIME BARBÉ, OF PARIS, FRANCE.
APPARATUS FOR LIGHTING AND EXTINGUISHING GAS BURNERS OF STREET LAMPS.

1,422,249.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, PAUL BERNARD and MAXIME BARBÉ, both citizens of the Republic of France, and residing, respectively, at Boulogne-sur-Seine and Paris, France, have invented a new and useful Improvement in or Relating to Apparatus for Lighting and Extinguishing Gas Burners of Street Lamps, which improvements are fully set forth in the following specification.

This invention relates to an apparatus for lighting and extinguishing gas burners of street lamps of the kind operated by pressure waves in the piping system.

The apparatus according to the present invention is intended to be placed on each burner with a pilot light for producing the lighting and it can be used for inverted burners. By means of the apparatus all the burners of a system can be lighted in the evening, some of them extinguished for reasons of economy in the middle of the night, and the rest of the burners extinguished at day break. This apparatus is therefore a three-"stroke" apparatus.

A construction of the apparatus is illustrated by way of example in the accompanying drawings. In the said drawings,

Figure 1 is a vertical section of the apparatus, the bell being in its low position.

Figure 2 is a vertical section of the same apparatus, the bell being in its raised position.

Figs. 3, 4, 5 and 6 are diagrammatic sectional views showing the different positions assumed by the parts during operation.

Figs. 7, 8, 9, 10, 11 and 12 are diagrammatic sectional views of a slightly modified form of the invention, and likewise show the different positions assumed by the parts during operation.

Fig. 13 is a diagrammatic sectional view showing a controlling part for a two-stroke system.

Fig. 14 is a diagrammatic sectional view of a further modified form of apparatus in which glycerine is used.

Figure 15 is an enlarged fragmental detail of Figure 1.

The apparatus comprises a cup A (Figure 1) containing mercury or other liquid, mercury being preferable as it makes it possible to reduce the dimensions of the apparatus, but it is obvious that any other

liquid of a lower density could be utilized. Obviously the liquid utilized must be capable of resisting frost.

Through the cup A passes a tube B to which is connected the gas supply pipe, and a tube C extending to the burner or burners controlled by the apparatus.

A bell D under which is secured a tube E, dips into the cup A, and round the said bell D are arranged six ribs F, three of which are arranged at the top, and three at the bottom. These ribs F guide the bell D in the cup A and prevent the walls of the bell from adhering to those of the cup A.

Controlling parts G¹ (Figure 1), G² (Figure 7), G³ (Figure 13), each of which is provided with internal grooves and stop notches or projections, are secured at the top of the bell D. These parts are interchangeable, according to the kind of lighting to be obtained.

A rod H (Figure 1) passing right through the upper part of the cup A, forms an axis for a balance beam I; one side of this beam I carries a weight J, and the other side is connected by a rigid or flexible link, to a movable weight K which is heavier than the balance weight J. In the centre of the beam I is secured a rod L with a bent point L¹ which engages with the grooves of one of the parts G¹ or G² or G³.

The working of the apparatus is brought about by waves of pressure in the gas supply, that is, by rises in gas pressure followed by return to normal pressure. The bell D is provided with ballast in order that it may be kept from rising except under the action of the desired pressure wave; in accordance with the pressure of each burner. The rise in pressure can be slow or quick.

The working of the apparatus will vary, as will be explained, in accordance with the shape of the controlling part G¹, G² or G³ used. Each of the said cases will be examined in succession:

1. Working of the apparatus with the part G¹:—

Let it be assumed that the apparatus is in the position shown in Figure 1, the bent point L¹ of the rod L engaging at *a* with the part G¹.

First stroke: The pressure wave is sent into the piping. The bell D will rise (Figure 2). The tube E secured under the bell

D, will emerge from the mercury and afford passage to the gas through the tube C so that it can pass to the burner where it is lighted by means of the pilot light, not shown in the drawing. During the rising, the bell D having lifted the weight K, the latter will no longer act on the beam I. The bent point of the rod L will be pushed from left to right by the weight J which sinks, and the said point follows the left hand groove and reaches the point *b* (Figure 2) which will limit the lift of the bell D. When the pressure is reduced to normal, the bell D will sink again, but the rod L pushed by the weight J will limit the descent of the bell D by engaging at *c* (Figure 3). The tube E will not descend again sufficiently to dip into the mercury, and the burner will remain alight.

Second stroke:—The pressure wave is sent into the piping. As shown in Figure 4, the rod point L^1 will engage at *d*. The pressure having been brought back to normal (Figure 5), the rod point engages the bell D at *e*. The position of the tube E will obviously be similar to during the first stroke, and the burner remains alight.

Third stroke:—The pressure wave is sent into the piping (Figure 6). The rod point L^1 engages at *f*. The pressure having been brought back to normal, the rod L follows the right hand groove so that it engages the bell D at *a* (Figure 1), and the bell can now descend to the position preceding the first stroke. The tube E closes the passage of the gas by dipping into the mercury and the burner is extinguished. The bell D in its descent has released the weight K which acts again on the beam I.

It should be noted that during the rising, the weight J will push the rod L from left to right in the bottom portion of any one of the parts G^1 , G^2 , G^3 used: In its descent, the weight K will push the rod L from right to left in the upper portion of the same part. A movement of the bent point of the rod L is therefore always ensured, whatever be the part G^1 , G^2 or G^3 used.

2. Working of the apparatus with the part G^2 :—

First stroke:—The bell D and the mercury having the same position as in Figure 1, and the bent point of the rod L engaging at the point *g* (Figure 7), the pressure wave is sent into the piping. The rod L following the left hand groove, will engage at *h* (Figure 8) and the burner will be lighted. The pressure having been brought back to normal, the rod point L^1 (Figure 9) will engage the bell D at *i* and the burner will remain alight.

Second stroke:—The pressure wave is sent into the piping. The rod point L^1 (Figure 10) arrives at *j*. The normal pressure is re-established: The rod L (Figure 11) fol-

lows the right hand groove and its point L^1 engages the bell D at *k*. Owing to the descent of the bell D, the tube E is caused to dip into the mercury and the burner is extinguished.

Third stroke:—The pressure wave is sent into the piping. The rod point L^1 (Figure 12) arrives at *l*, but the tube E does not emerge from the mercury and the burner remains extinguished. The normal pressure is reestablished: The rod point L^1 returns to *g*, the position preceding the first stroke (Figure 7).

3. Working of the apparatus with the part G^3 :—

The working will be the same as with the part G^1 , except that the second stroke will be done away with. This apparatus is a two stroke one. It is intended for cases which require only a single lighting and a single extinction.

As already stated in the foregoing, all these apparatus can work with liquids other than mercury, for instance with glycerine. But as shown in Figure 14, in the event of glycerine being used, a small cup N containing mercury, is arranged at the top of the tube C^1 . The tube E will therefore close and open the passage for the gas into the cup N, the glycerine being utilized merely for the joint or seal between the bell and the large cup.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. In an automatic gas controller, the combination of a rising and falling, pressure-operated gas bell; a controlling member mounted on the top of the bell to move therewith and provided with grooves and projections; a weighted balance beam disposed above and extending horizontally across said member; and a rod depending from and rigidly related to the central portion of said beam and having a part arranged to cooperate with said grooves and projections to control the movements of the bell.

2. In an automatic gas controller, the combination of a rising and falling, pressure-operated gas bell; a controlling member mounted on the top of the bell to move therewith and provided with grooves and projections within its interior; a weighted balance beam disposed above the controlling member; and a rod rigidly related to said beam and having a part which projects into the interior of said controlling member and which is bent at its free end for cooperation with the grooves and projections to control the movements of the bell.

3. An automatic gas controller, comprising, in combination, a rising and falling, pressure-operated gas bell; a controlling member mounted on the top of the bell to

move therewith; a rocking balance beam disposed above and extending horizontally across the controlling member; and a rod depending from and rigidly related to said beam for cooperation with said member to control the movements of the bell.

4. An automatic gas controller, comprising, in combination, a rising and falling, pressure-operated gas bell; a controlling member mounted on the top of the bell to move therewith; a rocking balance beam disposed above the controlling member and having a weight at each end, one weight being fixed and the other movable relatively to said beam; and a rod rigidly related to

said beam for cooperation with said member to control the movements of the bell.

5. An automatic gas controller, as claimed in claim 4, in which the movable weight is suspended by a link from the beam and is adapted to rest on the top of the bell during the rising movement of the latter.

In testimony whereof we have signed this specification in the presence of two subscribing witnesses.

PAUL BERNARD.
MAXIME BARBÉ.

Witnesses:

CHARLES LÉON LOISE,
BING COW.