

W. A. CARR.
AUTOMATIC GAS LAMP.
APPLICATION FILED JUNE 15, 1910.

974,748.

Patented Nov. 1, 1910.

2 SHEETS—SHEET 1.

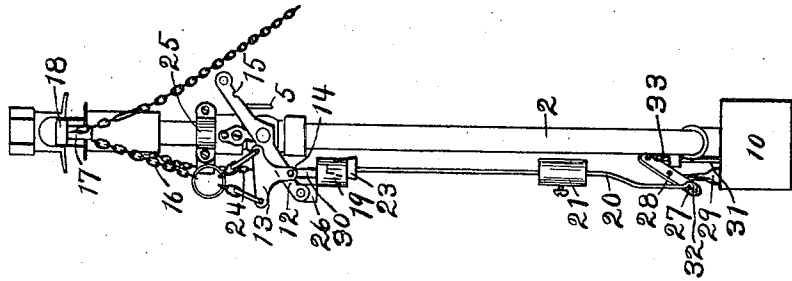


FIG. 3—

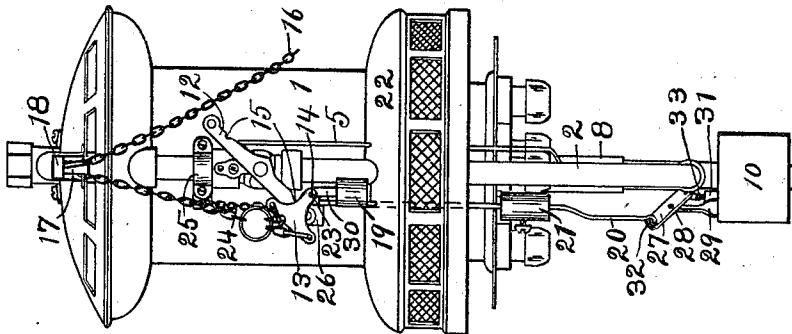


FIG. 2—

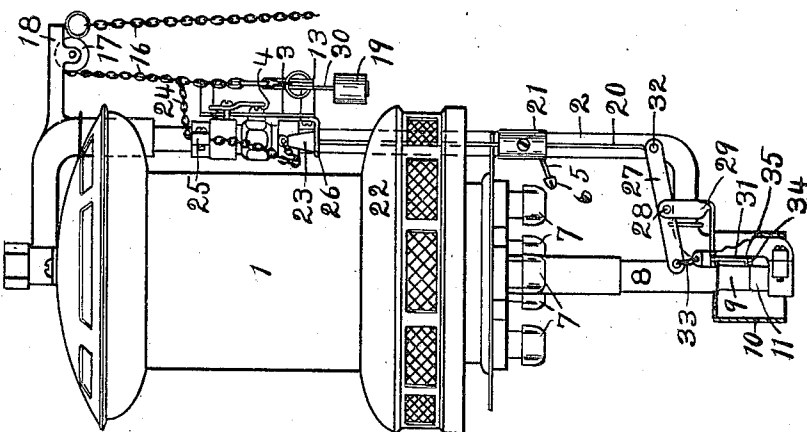


FIG. 1—

WITNESSES:

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INVENTOR.

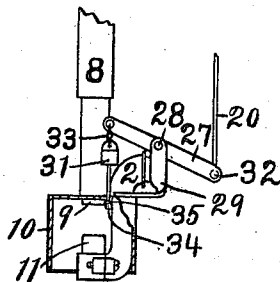
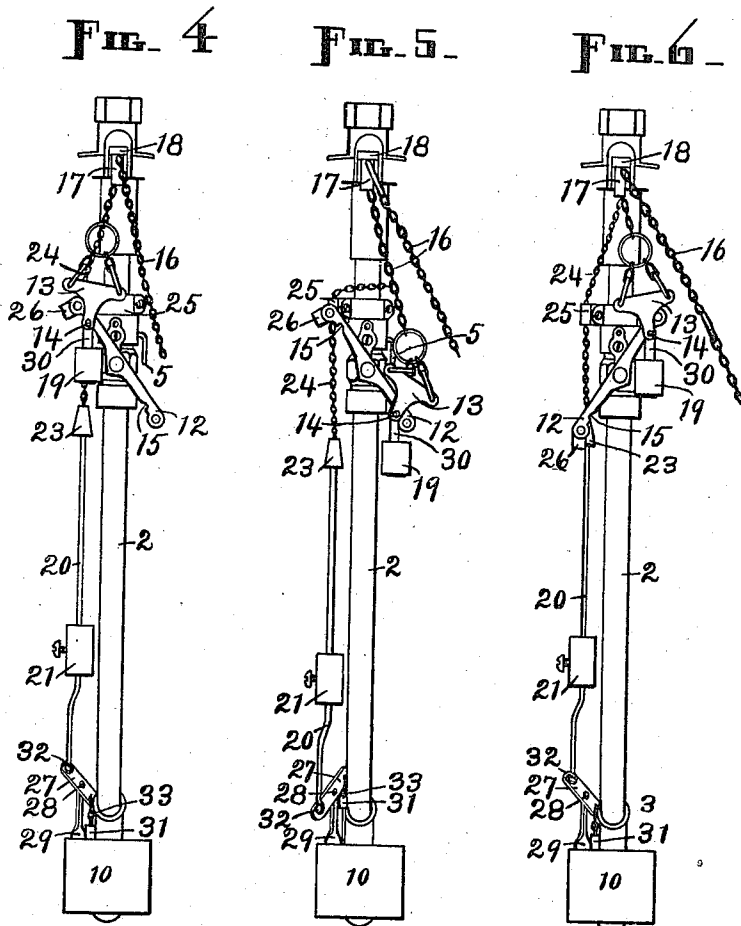
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FIG. 7-

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UNITED STATES PATENT OFFICE.

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AUTOMATIC GAS-LAMP.

974,748.

Specification of Letters Patent.

Patented Nov. 1, 1910.

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To all whom it may concern:

Be it known that I, WILLIAM A. CARR, a citizen of the United States of America, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Automatic Gas-Lamps, of which the following is a specification.

My invention relates to improvements in automatic or so-called self-lighting gas lamps, that is, lamps which are lighted from pilot-lights, and said invention relates more particularly to the air valve-operating mechanisms for such lamps, in which certain peculiar connections between and with the air valve and the gas valve-operating mechanism in a lamp of this kind are provided, as hereinafter set forth.

The primary object of my invention is to prevent what is known as a "flash-back," in this type of lamp, by providing such a lamp with means of control for the air, whereby the air is admitted to the mixing-chamber in full and continuous volume only after the gas valve has been opened. In the event there is a leak in the gas valve of a lamp equipped with my improved mechanism, said lamp can be lighted without serious explosion, and should the elements in the mixing-chamber become ignited, as is liable to occur in case of a leak or faulty action from some other cause, so that the burners or mantles do not light when the operating cord or other flexible member is pulled for that purpose, upon pulling such member again to shut off and then turn on the gas and air proper lighting of the lamp is effected. By the use of this mechanism the force of the explosion, at the time of lighting the lamp, is reduced about one-half, and the lamp can be actively employed or burned without carbonizing when the operator neglects to turn on the full head of gas.

A further object is to provide means of control for the air, which is inexpensive and simple in construction and operation, is not liable to get out of order, and can be incorporated with the lamp without requiring any change in the latter.

Other objects will appear in the course of the following description.

I attain the objects and secure the advantages of my invention by the means and

mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a lamp which is equipped with a practical form of my invention, the working parts being disposed so as to close the valves; Fig. 2, a front elevation of said lamp, showing said working parts arranged as in the preceding view; Fig. 3, a front elevation of the working parts and the members of the lamp which support said parts and are most intimately associated therewith, showing what may be termed the first step in the opening operation; Fig. 4, a front elevation of parts and members, similar to those which appear in Fig. 3, showing the next step in the opening operation; Fig. 5, a similar elevation showing the disposition of the working parts when the valves are open; Fig. 6, an elevation showing the first step in the closing operation, and, Fig. 7, a detail of the mixing-chamber, air valve, and directly-connected operating members for said valve, the latter being shown open.

In the first and last views a portion of the mixing-chamber is broken away to show the interior of said chamber.

Similar figures refer to similar parts throughout the several views.

My invention is illustrated in connection with a well-known type of lamp which comprises a body 1, a gas-supply tube 2 in which is the usual gas valve to the stem of which an operating arm 3 is rigidly attached at 4, a pilot-light tube 5 and burner 6, mantle stems 7, a mixture tube 8 in the lower terminal of which is a sliding tubular air-supply valve 9, and a mixing-chamber 10. The gas supply tube 2 opens at 11 within the mixing-chamber 10, either into the air-supply valve 9 when closed, as shown in Fig. 1, or into said chamber when said valve is open, as shown in Fig. 7.

In addition to the above-mentioned old members are the following:—An arm 12 similar to the arm 3 and rigidly secured thereto but spaced apart therefrom, these two arms and their connections constituting a walking-beam for operating the gas valve to open and close the same, a carriage 13 slidably mounted on said arm 12 and having a cross-piece 14 that is adapted to enter either of two notches 15 in the underside

of said arm 12, and an operating chain or other flexible member 16 which is attached to said carriage and passes therefrom upward over a pulley 17 mounted at the outer end of a fixed arm 18. A weight 19, which heretofore has been attached to the chain 16, is supported from the carriage 13 in this case by means of an arm 30 loosely depending from the cross-piece 14.

The operation of the members thus far described is practically the same as that of similar members in any lamp of the type now under consideration, and need be only briefly touched upon in connection with the subsequent explanation of the operation of the new mechanism.

The aforesaid new mechanism, as herein shown, consists of a vertical rod 20 provided with a weight 21 and arranged to slide in the bottom flange 22 of the lamp body 1, a lug 23 at the upper terminal of said rod, a branch 24 from the flexible connection or chain 16, one end of which flexible branch or chain is fastened to the top of said rod, a guide 25 for said branch, such guide being secured to the tube 2 above the position of the valve therein, a step 26 secured to the walking-beam at the end adjacent to said lug and on the back side, a lever 27 pivotally connected intermediate of its ends, at 28, to a bracket 29, which bracket is fastened to the top of the mixing-chamber 10, and a lifter 31 for the air valve 9.

The guide 25 is so placed that the vertical eye therein, through which the branch chain 24 passes, is over the rod 20, and said chain extends upward from said rod through said eye to the chain 16 to which it is fastened a little distance from the double terminal portion of said chain 16 that is attached to the carriage 13. The relative positions of the lug 23 and the step 26 are such that, when the left-hand end of the walking-beam is down and the carriage 23 at the lowest point on this end of said walking-beam, said step is beneath said lug and the latter with the rod 20 is held up thereby. The lower end of the rod 20 is pivoted at 32 to the front end of the lever 27. The head of the lifter 31 is loosely connected with the back end of the lever 27 by means of a link 33. The lifter 31 plays freely up and down through an opening in the top of the mixing-chamber 10, and has at its base an enlargement 34. A perforated extension 35 is provided on the front of the valve 9 at the bottom, and the lifter 31 passes through said extension with the enlargement 34 under the same, so that said valve is carried upward with said lifter.

Having now fully described the mechanism by means of which the two valves in the lamp are operated, I will next proceed to explain the complete working of the same,

starting with the parts disposed as in Figs. 1 and 2, first calling attention to the fact that the rod 20 is therein represented as being held up by the step 26, through the medium of the lug 23, which permits the tubular valve 9 to rest on the terminal 11 of the tube 2 in the mixing-chamber 10 and thus shut off the air from the tube 8. The chain 16, or that portion thereof that hangs down from the pulley 17 in front of the operating mechanism, and which is represented as being swung off to one side, in Figs. 2, 3, 4, 5 and 6, so as not to obscure such mechanism, is pulled down as far as possible and then released, with the result that the positions of the parts are changed from those which they occupy in the first two views to those which they occupy in Figs. 5 and 7, and both valves are opened and remain open until said chain is again pulled and released in the same way as before, when said valves are closed, the change then being from what is shown in said Figs. 5 and 7 to what is shown in Figs. 1 and 2. These are the only operations which concern the operator, but it is necessary to know what actually takes place in detail at the performance of these operations in order to have a clear understanding of the invention and its merits, and this information will be found below.

When the chain 16 is pulled to open the valves, the carriage 13 is first drawn up until the cross-piece 14 enters the left-hand notch 15 in the arm 12, when the walking-beam is rocked and the step 26 is moved out from under the lug 23. The weight 21 now causes the rod 20 to drop and to rock the lever 27 on its pivot 28 in such a manner as to elevate the lifter 31 and raise the valve 9 into the position shown in the last view. The position of the operating mechanism at this instant is shown in Fig. 3. As the pull on the chain 16 continues the walking-beam is actuated into the position shown in Figs. 4 and 5, through the medium of the carriage 13 and by reason of the engagement between the cross-piece 14 and the left-hand notch 15, and at the same time the branch chain 24 is drawn up and with it the rod 20, with the result that the lever 27 is tilted or rocked in the opposite direction and the lifter 31 and valve 9 descend to shut off the air from the tube 8, the operating mechanism appearing as shown in Fig. 4. Finally, upon the release of the chain 16, the rod 20 descends again and opens the air valve, and the weight 19 causes the carriage 13 to slide down on the arm 12 into the position shown in Fig. 5. Thus it will be seen that the tilting of the walking-beam, in the above-described manner, has opened the gas valve, to the stem 4 of which said walking-beam is affixed, and that the air valve has been opened for an instant to admit a little

air to the tube 8, with the gas which has begun to flow, then closed for another instant, and finally opened again and so left. When the valve 9 is closed the gas flows directly from the end 11 of the tube 2, through said valve, into the tube 8, but when said valve is open the gas mixes with the air in the mixing-chamber 10 before passing into said tube 8 through the then elevated valve.

By admitting the gas and air to the burners in the peculiar manner set forth and incident to the construction of my mechanism, the right mixture, in which the gas is greatly in excess of the air, for lighting to the best advantage is presented to the burners, and then, after such lighting takes place, the regular mixture is furnished. It is understood, of course, that the gas to the burners, mixed with what little air is first permitted to enter the tube 8 with said gas, is ignited from the pilot-light at the burner 6.

When the chain 16 is pulled to shut off the gas and air and so extinguish the lamp, leaving only the pilot light burning, the carriage 13 is first drawn up until the cross-piece 14 enters the right-hand notch 15 and the walking-beam is tilted, by reason of such engagement, into the position shown in Figs. 6, 2 and 1, to close the gas valve, and the rod 20 is drawn up by the branch chain 24 to close the air valve 9 through the medium of the lever 27 and lifter 31. When actuated into this position the walking-beam thrusts the step 26 under the lug 23, which latter settles down onto said step, upon the release of the chain 16, and so holds the rod 20 in its elevated position, thus leaving the valve 9 closed. When the chain 16 is released the weight 19 causes the carriage 13 to move down on the arm 12 from the position shown in Fig. 6 to that shown in Figs. 1 and 2.

The opening and closing operations, as described above, can be repeated indefinitely and always with the same results.

Should the chain 16 not be pulled sufficiently to open the gas valve wide, but only enough to throw the walking-beam into a horizontal position, for example, the result so far as lighting is concerned would not be effected, and the amount of air admitted after lighting would be the same as though said valve were wide open, but, of course, the volume of gas would be cut down somewhat. The parts act so quickly and their actions are so accurately timed that there is no opportunity for flash-backs or for other improper effects to be produced. The branch chain 24 must be long enough to permit the parts to move into the positions shown in Figs. 3 and 7, and the subsequent actions to occur, otherwise, the purpose of the invention would be defeated, consequently said chain hangs loosely while the air valve is closed, as clearly shown in Fig. 1.

That some more or less extensive modifications in the construction of the several parts and members which enter into the *ensemble* of my invention may be made, is obvious to one skilled in the art, wherefore I do not desire to be unduly restricted in these particulars.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a lamp, of the class described, air valve-operating mechanism comprising, with the air valve, a longitudinally-movable downwardly-pressed rod provided with a lug, connections between said valve and said rod, a suitably-mounted movable member arranged to be thrust into the path of said lug and to be withdrawn from such path, and means to elevate said rod and operate said movable member.

2. The combination, in a lamp of the class described, with a gas valve-operating rocker member, an operating carriage for such member slidingly mounted thereon, a flexible operating member attached to said carriage, and the air valve, of a longitudinally-movable downwardly-pressed rod provided with a lug and operatively connected with said air valve, a projection on said rocker member movable into and out of the path of said lug when said rocker member is actuated, and a flexible connection between said flexible operating member and said rod.

3. The combination, in a lamp of the class described, with a gas valve-operating rocker member, an operating carriage for such member slidingly mounted thereon, a flexible operating member attached to said carriage, and an air valve, of a longitudinally-movable downwardly-pressed rod provided with a lug at the upper terminal, a projection on said rocker member movable into and out of the path of said lug when said rocker member is actuated, a flexible connection between said flexible operating member and said rod, a suitable lifter for said air valve, and a suitably-mounted lever connecting the lower terminal of said rod with said lifter.

4. The combination, in a lamp of the class described, with a mixing-chamber, a gas-supply tube opening into said chamber, a mixture tube, a tubular air valve slidingly mounted in said mixture tube in operative relation to the terminal of said first-mentioned tube which is in said chamber, a gas valve stem protruding from said gas-supply tube, a rocker member affixed to the protruding terminal of said stem, an operating carriage for said rocker member slidingly mounted thereon, and a flexible operating member attached to said carriage, of a longitudinally-movable downwardly-pressed rod provided with a lug at the upper terminal, a projection on said rocker member movable

into and out of the path of said lug when
said rocker member is actuated, a flexible
connection between said flexible operating
member and said rod, a longitudinally-mov-
5 able lifter connected with the terminal of
said air valve which is in said chamber, and
a lever mounted adjacent to said chamber

and connecting the lower terminal of said
rod with said lifter.

WILLIAM A. CARR.

Witnesses:

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A. C. FAIRBANKS.