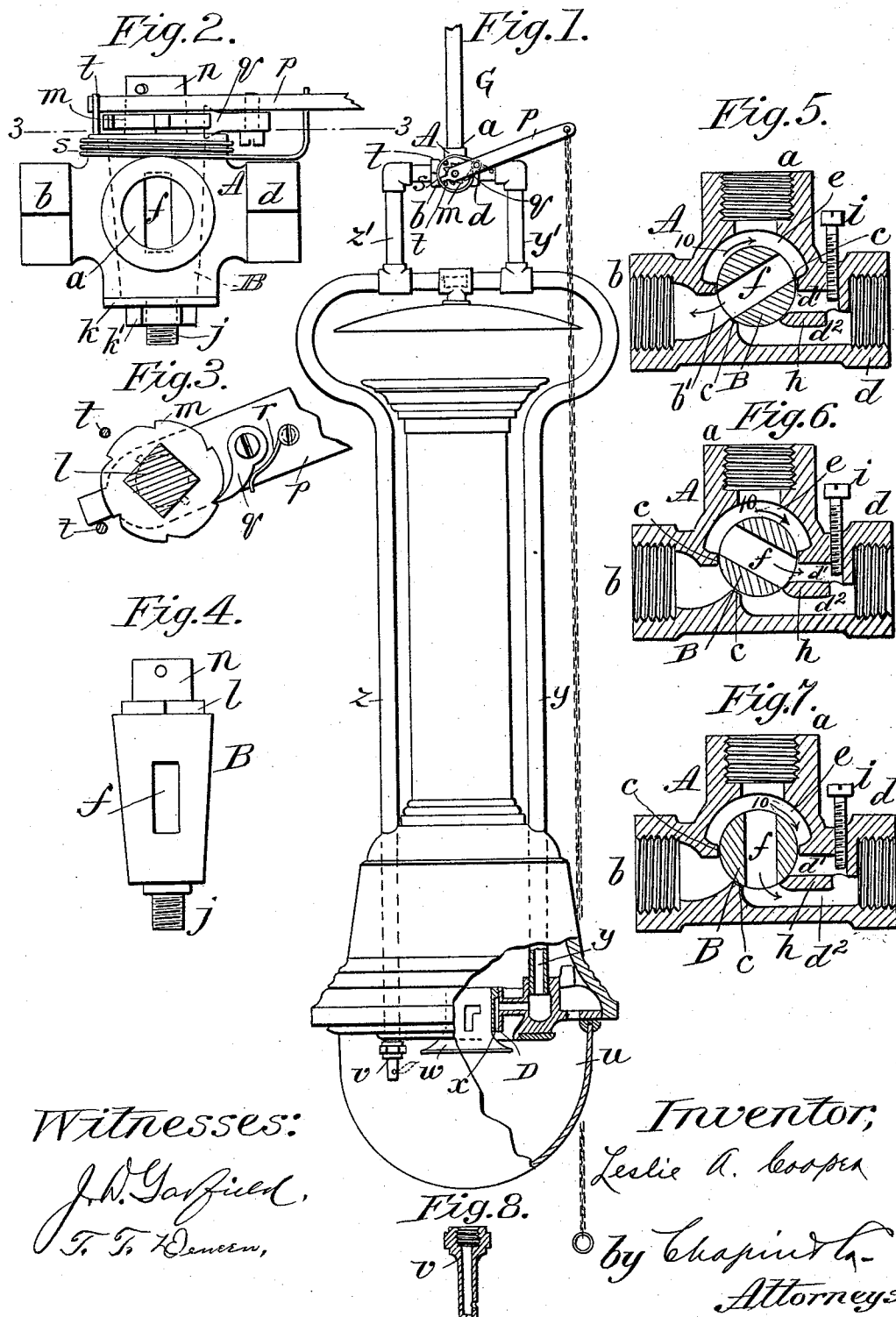


(No Model.)

L. A. COOPER.
GAS LAMP.

No. 487,065.

Patented Nov. 29, 1892.



Witnesses:
J. H. Garfield,
T. T. Deane,

Inventor,
Leslie A. Cooper
by Chapin & Co.
Attorneys.

UNITED STATES PATENT OFFICE.

LESLIE A. COOPER, OF SPRINGFIELD, MASSACHUSETTS.

GAS-LAMP.

SPECIFICATION forming part of Letters Patent No. 487,065, dated November 29, 1892.

Application filed June 3, 1891. Serial No. 394,991. (No model.)

To all whom it may concern:

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

This invention relates to improvements in gas-lamps, the object being particularly to produce a valve which is of simple construction and adaptable for uses such as hereinafter explained.

The invention consists in the construction and combination of the parts, all substantially as will hereinafter more fully appear, and be set forth in the claims.

In the accompanying drawings, Figure 1 is a side elevation of the valve and operating-lever shown as in working application on a gas-lamp. Fig. 2 is a plan view of the valve. Fig. 3 is a section taken on line 3 3, Fig. 2. Fig. 4 is a detail view of the plug or key of the valve. Figs. 5, 6, and 7 are sectional views taken through the ways of the valve, the plug being shown as moved into the different positions which it may be caused to occupy. Fig. 8 is a view of a part in detail to be hereinafter referred to.

Proceeding now to describe the valve, A represents the body thereof, of T form, having the inlet-way *a*, the outlet-way *b* at one side, and another outlet-way *d* at the other side.

B represents the plug or key of the valve, passing laterally and intermediately through the close-fitting opening *c* therefor in the valve-body. The valve-plug B has the opening *f* diametrically through the intermediate portion thereof, and the inlet-way *a* at and about the upper side of the opening *c*, through which the valve-plug passes, is widened or extended, as at *e*, so that no matter how far around the plug may be turned communication is always open from the inlet-way *a* to the opening *f* in the plug. The inner area or section of the outlet-way *b* is contracted, as at *b'*, so that its width is more or less the same as that of the opening *f*. The inner area or throat of the other outlet-way *d* has

therein the short wall or partition *h*, (which extends and forms a part of the wall for the opening *c*,) whereby the outlet-way *d* is as to its inner portion constituted by the sub-passages *d'* and *d''*, substantially as shown. The passage *d'* is susceptible of being contracted in a greater or less degree, as desired, by means of the screw *i* or other equivalent device, which passes through the body of the valve to lie by its inner end portion more or less across and to obstruct the said passage *d'*.

The plug B is formed tapered and ground to fit in the lateral opening *c* through the valve-body and at its smaller end is necked down and threaded, as at *j*, such latter portion receiving the washer *k* and confining-nut *k'*. The other end of the said valve-plug is squared, as at *l*, receiving thereon the ratchet-wheel *m*, beyond which the plug is extended to form the journal *n* for the pawl-carrying lever *p*, which is fitted for a support and swinging movement on said journal. The pawl *q*, pivotally mounted on the lever *p*, is constrained in engagement with the ratchet-wheel by the spring *r*, so that when the lever is swung in the one direction—here downwardly—it will force the ratchet and valve-plug around in the direction indicated by the arrow 10 in Fig. 5 to an extent corresponding to the length of the swing of the lever, and of course when the lever is returned to its normal position the pawl will slip back over the ratchet tooth or teeth to be next engaged.

The means shown for restoring the pawl-carrying lever consists of the spring *s*, which has several convolutions encircling and held upon the valve-body and bears by its reacting extension upwardly against the under side of the lever. *tt* represent stop-pins fixed upon the valve-body so that the swinging reciprocal movement of the lever may be properly limited.

Now, particularly noting Figs. 5, 6, and 7, it will be seen, first, that the valve-plug may be turned so that communication may be had through it from the inlet-way *a* to the outlet-way *b*, or, second, from the inlet-way *a* through the valve-plug and the outlet *d* by way of the

sub-passage d' , or, third, from the inlet-way a through the valve-plug and the outlet d by way of the other supplemental passage d^2 , accordingly as the plug is properly turned to secure either of the courses set forth.

The utility of a valve of the description above given will probably be more readily apparent on explaining and setting forth a manner of its use in connection with a gas-lamp of the regenerative class, sufficient of the construction of which lamp is given in Fig. 1, in which D represents the burner, inclosed within the casing and glass globe u at the lower end of the lamp, the burner comprising the feature of an annular opening x , to which the gas is supplied in substance by the pipe y .

w represents an annular part of bell-mouth shape supported in proximity to the said annular opening x and upon which the gas impinges and about which it burns when ignited.

z represents another pipe leading downwardly to terminate in the jet v within the globe and in proximity to the part w and the passage x . The jet has a contracted opening, as more clearly represented in Fig. 8, so that the exit of gas thereat is but slight.

The pipe y and the pipe z have no communication the one with the other; but the pipe y has the extension or branch y' , which leads to communication with the way d of the valve-body A , while the other pipe z has the continuation or branch z' , which is coupled to the valve-body at the outlet-way b thereof. G represents the primary gas-supply pipe, to the end of which the valve-inlet is connected.

Now it is desired, even where the lamp is not required to give forth light for illumination, to have a small flame burning at the jet v , so that when the supply of gas for illumination is turned onto the burner it may be readily ignited, not necessitating the opening of the globe for the application of a lighted match. Again, in this form of lamp it is desirable at the time of lighting up to let on only about a half or some such portion of the head of gas for the reasons that the more perfect combustion of the full supply of gas cannot be had until a sufficient amount of heat has been generated at and about the burner, and, moreover, in cold weather it is necessary to heat the glass globe, but gradually to avoid breakage thereof, and thus it will be apparent that when the valve-plug is in the position shown in Fig. 5 there will be a gas-supply only through the pipe z to burn as a jet at v . Then on desiring to light up the lever p is downwardly swung by means of the chain or whatever appliance is provided to bring the valve-plug into the position shown in Fig. 6, when a fraction of the full gas-supply may pass through the valve by way of the obstructed passage d' and through the pipe y to the burner. It will be apparent from the illustration given that the partial gas-supply to the jet is cut off; and now, the conditions for perfect combustion having been

established, the valve-plug-operating lever is again reciprocated, when the full gas-supply to the burner is had by way of the sub-passage d^2 and outlet d of the valve to and through the said pipe y ; and, again, it will be noted on now securing a further rotational movement of the valve-plug in the same direction that before the way f in the valve-plug can be carried entirely out of coincidence with the full-supply valve-passage d^2 to shut the gas off from exit therethrough the way f in the valve-plug will have portions of the area of its orifice open to both the way b and the way d^2 , so that before the burner-flame is extinguished the little light at the jet (sometimes termed the "pilot-light") will be relighted. In the turning of the valve-plug from the position shown in Fig. 5 to that shown in Fig. 6 the way f of the valve-plug will have portions of the area of its orifices open to both the way b and the way d' , said way f also then being in communication with the inlet, so that a sufficient supply of gas will be admitted to the burner to be lighted before the gas is entirely shut off from the jet.

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

1. The combination, with a gas-lamp having a main burner and adjacent thereto a secondary burner or jet, of a valve having an inlet-way a and differently-directed outlet-ways b d , the latter of which comprises sub-passages d' d^2 , and the rotatable valve-plug having a way, the said valve-plug way and the ways of the valve-body being so formed and relatively arranged that there will be at given positions of the plug a communication between the inlet and one or the other of the said three exit-passages and upon the full opening of any one of the said exit-passages the closing of both of the other exit-passages, the inlet-pipe coupled to the inlet-way of the valve, a pipe in communication with both of said sub-passages d' d^2 and terminating for gas-delivery at the main burner, and a pipe leading from the other exit-way b of the valve to the secondary burner, substantially as and for the purposes set forth.

2. The combination, with a gas-lamp having a main burner and adjacent thereto a secondary burner or jet, of the valve having a rotatable valve-plug with a way f transversely through it, the valve-body having a socket for the plug, an inlet-way leading to said socket and having at its junction with said socket the widened aperture e , an outlet-passage b , leading from one side of said socket, and two adjacent outlet-ways d' d^2 , leading from another side of the socket, and said way and closing portions of the plug, together with the differently-directed outlet-ways, so relatively arranged that communication may be had between the inlet and one side outlet b , between the inlet and partially with said outlet b and one of the paired

passages d' d^2 , or between the inlet and solely with either of the adjacent paired outlet-passages d' d^2 , the gas-inlet pipe coupled to the valve-inlet, a pipe in communication with
5 said way b and leading to the jet or secondary burner, and a pipe in communication with both of said passages d' d^2 and terminating

for gas-delivery adjacent the main burner, substantially as and for the purposes set forth.

LESLIE A. COOPER.

Witnesses:

WM. S. BELLOWS,
T. F. DENEEN.