(No Model.)

E. J. THOMPSON.

HYDROCARBON BURNER.

No. 476,177. Patented May 31, 1892.

Fig: 1.

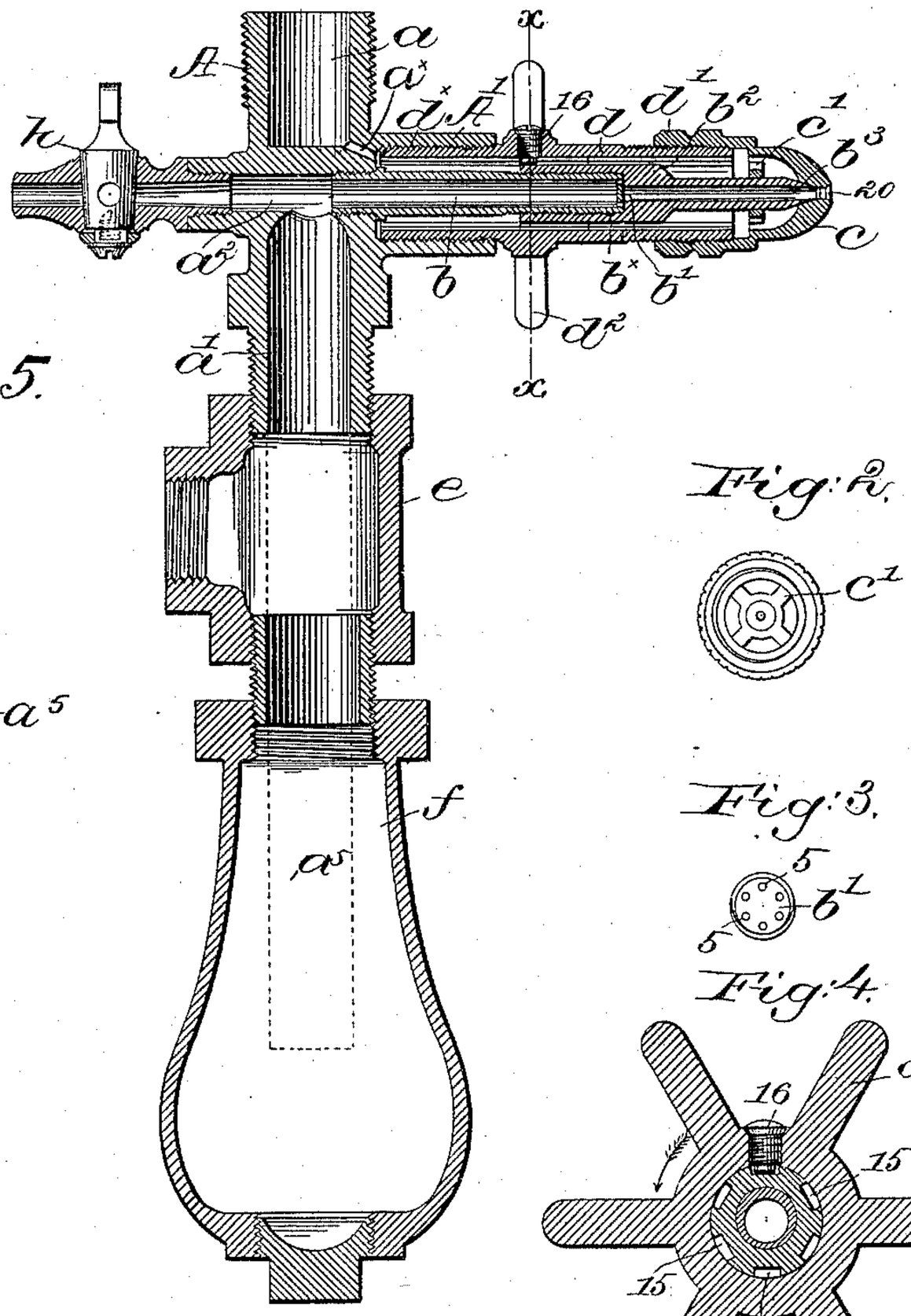

Fig: 5.

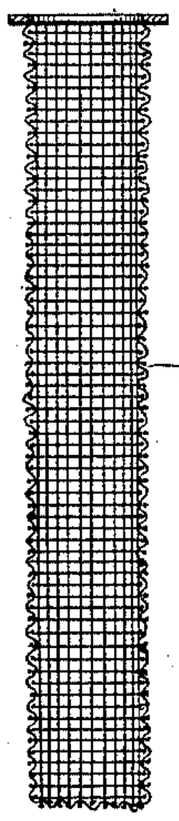

Fig: 2.

Fig: 3.

Fig: 4.

Witnesses:
Fred S. Greenleaf.
Oscar F. Hill.

Inventor:
Edward J. Thompson.
by Crosby & Gregory Attys.

UNITED STATES PATENT OFFICE.

EDWARD J. THOMPSON, OF ANTRIM, NEW HAMPSHIRE, ASSIGNOR TO THE GOODELL COMPANY, OF SAME PLACE.

HYDROCARBON-BURNER.

SPECIFICATION forming part of Letters Patent No. 476,177, dated May 31, 1892.

Application filed August 6, 1891. Serial No. 401,843. (No model.)

To all whom it may concern:

Be it known that I, EDWARD J. THOMPSON, of Antrim, county of Hillsborough, State of New Hampshire, have invented an Improvement in Hydrocarbon-Burners, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

This invention relates to hydrocarbon-burners, and has for its object to improve and simplify the construction and operation of the same.

Hydrocarbon-burners as sometimes constructed have a common and uniform adjustment to regulate both the admission of oil to the burner and also the admission of air to mix therewith; but in practice it has been found that with an additional quantity of oil a still greater proportion of air was necessary, so that a uniform adjustment would not fill the conditions, and accordingly burners have been constructed wherein the oil and air have been regulated by independent means, such an arrangement requiring additional care and time.

One part of this invention has for its object to provide a variable feed for the air and oil, whereby both may be adjusted at once and by the same means, and still as the quantity of oil permitted to flow through the burner is increased the flow of air is increased in greater proportion.

Hydrocarbon-burners as heretofore constructed have been exceedingly difficult to clean when they become clogged with sediment or other foreign substance conveyed to the burner by either the air or oil, usually the latter, and another object of this invention is to provide simple and effective means for blowing out or cleaning the oil-passages when they become clogged.

One part of this invention in hydrocarbon-burners therefore consists of a stationary oil-tube and a movable oil-tube, threaded to move with relation to said stationary oil-tube and to regulate by such movement the flow of oil through the tubes, an air-tube, surrounding said oil-tubes and threaded to move with relation to said movable oil-tube to regulate the flow of air, and means for effecting a variable movement of said air-tube and movable oil-tube, to operate substantially as will be described.

Other features of this invention will be pointed out in the claims.

Figure 1 of the drawings represents in vertical section a hydrocarbon-burner embodying this invention; Fig. 2, a rear side end view of the tip or burner; Fig. 3, an end view of the oil-tube, and Fig. 4 is a cross-section on the dotted line $x\,x$, Fig. 1. Fig. 5 represents in vertical section the sieve or netting shown in dotted lines, Fig. 1.

Referring to the drawings, the T-shaped casting A has formed within it an air conduit or passage a and an oil conduit or passage a', the latter communicating with a horizontal passage a^2, as shown, into which is tapped the end of the oil-tube b, having its outer end b' closed and provided with a series of perforations or small openings 5, (see Figs. 1 and 3,) to be referred to. The oil-tube b has a fine external thread $b^\times$ cut upon its outer end, upon which is screwed the movable oil-tube b^2, having a passage b^3 for the oil to flow through, said passage being considerably smaller than the stationary tube b', the shoulder formed at 6, Fig. 1, between the different bores of the movable tube serving as a valve to close the perforations 5 in the end of the stationary tube b when the shoulder 6 is pressed up against said end, as shown in Fig. 1. The outer end of the movable tube b^2 is preferably made conical or beveled, as shown in Fig. 1, to co-operate with a similar opening in the end of the tip or burner c, threaded upon the exterior of the air-tube d, having a coarse thread $d^\times$ cut upon its inner end and screwed into the neck A′ of the casting A. The tip c is provided with an interior spider or support c', (see Fig. 2,) through which the movable oil-tube b^2 is extended to provide a proper support for the said oil-tube, and the air-tube d has threaded upon it a lock-nut d' to assist in holding the tip c in proper adjusted position. The inner end of the oil-tube b^2 is provided with a series of longitudinal grooves 15, (shown best in Fig. 4,) into one of which is extended the end of a screw 16, tapped into the air-tube d, said air-tube preferably at or near the point where the screw

16 is located being provided with one or more operating-handles d^2, by which the said air-tube may be rotated in one or the other direction to move the same and the tip c toward and from the end of the movable oil-tube b^2.

In the position of the parts shown in the drawing Fig. 1 the tip c is tightly screwed against the conical end of the movable oil-tube b^2, thus closing the air-tube at that point while the oil-tube is closed or cut off by the shoulder 6 of the movable tube b^2 against the end b' of the stationary tube b. As the air-tube d is rotated to the left or in the direction of the arrow, Fig. 4, by means of the handle d^2, the thread $d^\times$ will move the said air-tube out or away from the casting A, thus moving the tip c away from the end of the movable oil-tube b^2, while the screw 16, extending into one of the grooves 15 in the exterior of the movable oil-tube b^2, will cause the latter to be rotated with the air-tube d; but the thread $b^\times$ is much finer than the thread $d^\times$, so that while the movable oil-tube b^2 is moved away from the stationary oil-tube b and uncovering the openings or perforations 5 in the end of the tube b, the movement of the air-tube, owing to the coarser thread $d^\times$, is so much faster that the opening between the end of the movable oil-tube b^2 and the interior of the tip c will be preserved. The casting A at its upper end is provided with an exterior thread, by means of which any pipe or conduit leading from a suitable air-storage reservoir may be attached, the interior passage a of the said casting being in communication with the interior of the air-tube through the passage $a^\times$. (See Fig. 1.) The lower end of the casting A is also externally threaded and is screwed into the T connection e, which latter at its lower end carries a drip-chamber f. The cock or valve h, of usual construction, is tapped into the casting A in line and communicating with the passage a^2 therein.

The operation of my improved burner is as follows: Air is admitted to the casting A through any suitable pipe or connection from a storage-reservoir (not shown) under a pressure of some twenty or thirty pounds to the square inch. Oil, preferably crude petroleum, is admitted to the T connection e through any suitable connection, (not shown,) and also, preferably, under a pressure of some fifteen or twenty pounds to the square inch, the oil passing up within the passage a' in the casting A through a suitable sieve or netting a^5, interposed at the entrance to the said passage, the oil extending within the passage a^2 and stationary oil-tube b, as shown in Fig. 1. The air, while admitted within the air-tube d, is prevented from escaping by the tip c being tightly closed against the conical end of the movable oil-tube b^2, while the oil within the stationary oil-tube b is prevented from escaping from the perforations 5 by the shoulder 6, which is tightly screwed against the end of the said tube b. If, now, the air-tube d be rotated to the left by means of the operating-handles b^2, the movable oil-tube b^2 is moved away from the end of the stationary oil-tube b to open the perforations 5 in the end of the latter and permit oil in small quantities to flow through the passage b^3 within the movable tube b^2 to the opening 20 in the tip c, and at the same time the air-tube d, carrying the tip, is moved away from the casting A faster than the movable oil-tube b^2 is moved away from its stationary tube b, so that an opening is established between the tip c and the end of the tube b^2, surrounding the latter for the escape of the air under pressure, which air catches the oil as its issues from the end of the tube b^2 and throws the same in the form of spray through the opening 20 in the tip c, where it may be lighted and burned. If the flame produced by the ignition of the spray issuing from the tip c is not sufficiently large for the purpose for which the burner is used, the air-tube d may be further rotated to the left to permit an additional supply of oil to flow through the passage b^3, and at the same time and by the same movement the annular opening between the tip c and the end of the oil-tube b^2 for the escape of air is increased in greater proportion, so that whatever the quantity of oil permitted to flow through the passage b^3, whether it be greater or less, the opening for the escape of the air is properly varied to supply sufficient air to provide for proper combustion, the proportion of the air to the oil used increasing with the quantity of oil used. When it is desired to cut off the flame it is only necessary to turn the air-tube d to the right by means of the operating-handle until it stops, when the oil is cut off by the shoulder 6 moving up against the perforations in the end of the tube b, and immediately thereafter the air-opening surrounding the end of the oil-tube b^2 is also cut off, the air being practically cut off at the same time, although the oil is cut off slightly before the air to prevent the clear oil from being ignited after the air has been cut off. If under continued use the perforations 5 in the end of the tube b should become clogged, the oil-supply is cut off from the burner by means of any suitable valve (not shown) in the connection between the burner and the oil-supply and the cock h opened, when, if the oil-tube d be rotated to the left to open the perforations 6 in the tube b, and also the opening surrounding the end of the movable tube b^2 and the tip c, air under pressure will immediately fill the interior of the tip c, a portion of it escaping through the opening 20 therein and a portion being forced rearwardly through the passage b^3, perforations 6, and through the open cock h, thus effectually clearing the perforations and their oil-passages of any sediment which may have lodged therein. Thus while burners as at present constructed must be partially taken to pieces in order to clear the oil passages, in this present burner it is only necessary to cut off the oil-supply and open the burner, when the burner will

clear itself in a few minutes, thus effecting a great saving of time, while in ordinary burners of this class two or more valves are usually required to turn on or cut off the supply of air and oil. In this present burner one operating-handle accomplishes both objects. The drip or catch chamber *f* will receive and collect any sediment which flows to the burner with the oil and is prevented from passing to the tip by the wire-screen a^5.

This invention is not limited to the particular construction shown, as the same may be varied without departing from the scope of the invention.

I claim—

1. In a hydrocarbon-burner, a stationary oil-tube and a movable oil-tube threaded to move with relation to said stationary oil-tube and to regulate by such movement the flow of oil through the tubes, an air-tube surrounding said oil-tubes and threaded to move with relation to said movable oil-tube to regulate the flow of air, and means for effecting a variable movement of said air-tube and movable oil-tube, to operate substantially as described.

2. In a hydrocarbon-burner, the oil-tubes *b* b^2, threaded to move one with relation to the other to regulate the flow of oil therethrough, the air-tube *d*, and tip *c*, and a connection between said air-tube and oil-tube, whereby movement of the former will effect a different movement of the latter, to operate substantially as described.

3. In a hydrocarbon-burner, the oil-tube *b*, the movable oil-tube b^2, threaded thereon, movement of the latter with relation to the former regulating the flow of oil, an air-tube *d*, and tip *c*, the screw 16, and grooves 15, to operate substantially as described.

4. In a hydrocarbon-burner, a stationary oil-tube having a closed perforated end, a movable oil-tube threaded to move with relation to the said stationary tube and having a shoulder adapted to close the perforations in the end of said stationary tube, and an air-tube surrounding the said stationary and movable oil-tubes and having a tip to co-operate with the end of the said movable tube, substantially as described.

5. In a hydrocarbon-burner, a stationary oil-tube having a closed perforated end, a movable oil-tube threaded to move with relation to said stationary tube and having a shoulder adapted to close the perforations in the end of said stationary tube, an air-tube surrounding the stationary and movable oil-tubes and having a tip to co-operate with the end of said movable tube, and a cock to control the end of the stationary oil-tube opposite the closed perforated end, opening of the cock permitting fluid to be forced from the movable oil-tube through the perforations in the closed end of the stationary oil-tube and out from the latter through the cock, substantially as described.

6. In a hydrocarbon-burner, the combination of the following instrumentalities, viz: an oil-tube, a supply-conduit therefor, a drip-chamber in communication with the said conduit, a cylindrically-shaped sieve forming a continuation of said supply-conduit and extending down into said chamber and removed from the side walls thereof, and a lateral oil-supply opening located opposite said cylindrical-shaped sieve, substantially as described.

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

EDWARD J. THOMPSON.

Witnesses:

H. A. HURLIN,

G. W. HODGES.