

(No Model.)

W. H. CLARKE.
HYDROCARBON BURNER.

No. 499,968.

Patented June 20, 1893.

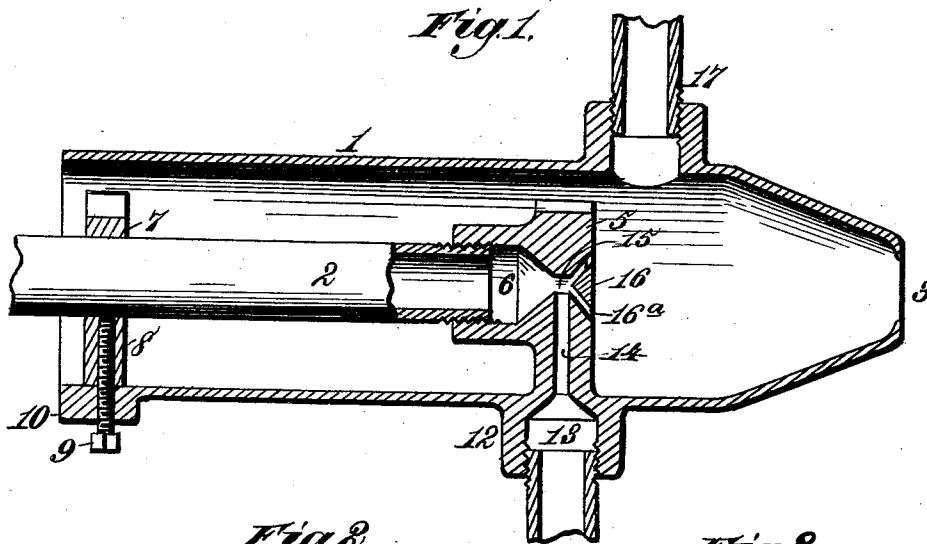


Fig. 2.

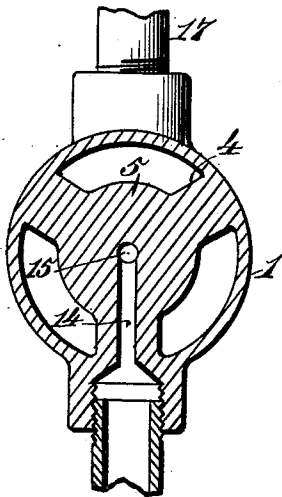


Fig. 3.

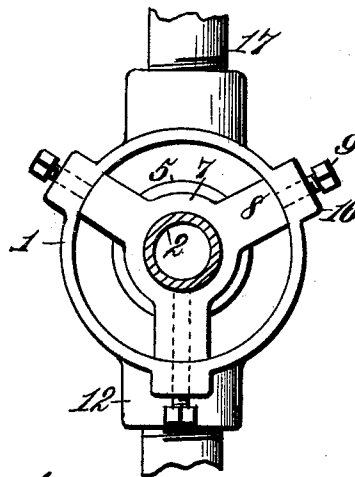
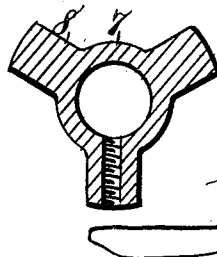


Fig. 4.



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UNITED STATES PATENT OFFICE.

WILLIAM H. CLARKE, OF BROOKLYN, ASSIGNOR OF ONE-HALF TO GUSTAVUS ISAACS, OF NEW YORK, N. Y.

HYDROCARBON-BURNER.

SPECIFICATION forming part of Letters Patent No. 499,968, dated June 20, 1893.

Application filed July 21, 1892. Serial No. 440,788. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. CLARKE, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented new and useful Improvements in Hydrocarbon-Burners, of which the following is a specification.

My invention relates to that class, or type, of oil-burners used in the consumption of hydro-carbon oil in conjunction with air and steam, or with compressed air substituted for steam.

It is the purpose of my invention to provide a simple and economical structure, so organized that the several parts shall have a definite, fixed relation, one to the other, of such kind as to effect the combination of the several gaseous ingredients in the best manner possible and their perfect consumption with the maximum heat, or light, obtainable. In the construction of burners of this type, heretofore, the union of the parts has been usually effected by such constructions as to require the services of a skilled laborer, or expert, in adjusting the several parts in order to secure the proper relation and the most efficient co-operation of the said parts, in action. In all burners of this type, a slight displacement of the steam-pipe, or fluid pipe, or of the terminal of the oil-pipe, is sufficient to defeat the purposes in view, and even when this defect of arrangement is so small as to be practically unnoticeable, the proper action of the combined parts will be, under the most favorable circumstances, so defective as to render the burner essentially worthless.

It is the main purpose of my invention to provide a novel and simple construction whereby these objections shall be avoided, and whereby the assemblage of the parts and their permanent union may be effected without the necessity of a final adjustment by experts, each burner having, when it leaves the factory, a perfect adjustment in all its parts, which is incapable of subsequent alteration.

It is my purpose, also, to simplify the construction and reduce the number of the parts, to avoid the use of needle-valves in the burner, and thereby obviate the gumming and carbonizing of the seating portions, and to reduce

the expense of manufacture of this class of burners in a material degree.

My invention consists, to these ends, in the several novel features of construction and new combinations of parts hereinafter fully set forth and then more definitely pointed out in the claims annexed to this specification.

To enable others skilled in the art to understand and to make, construct and use my said invention, I will now describe the same in detail, referring, for this purpose, to the accompanying drawings, in which—

Figure 1 is a longitudinal section taken in the axial line of a burner constructed in accordance with my invention. Fig. 2 is a transverse section in the line 2—2, Fig. 1. Fig. 3 is an end elevation of the burner shown in Fig. 1, the point of view being at the left-hand end. Fig. 4 is a detail view of the spider-support at the end of the burner.

In the said drawings the reference-numeral 1 indicates the casing of the burner, the main part thereof being cylindrical and of such dimensions that its interior diameter shall exceed the exterior diameter of the concentric steam-pipe sufficiently to provide an annular, intermediate space. Within this cylindrical portion is arranged the steam-pipe or fluid pipe 2, concentric, or substantially so, with the burner. This pipe is preferably a three-eighths inch gas-pipe, though I am not restricted to any special diameter thereof.

From the rear end of the burner to a point between its middle and its forward extremity, the body portion is of substantially equal diameter, or cylindrical, but at a short distance from its combustion-end it contracts to an open mouth 3, having a diameter, in the present instance, of about three-fourths of an inch, the contracted extremity having substantially the form of a frustum of a right cone, its axis being co-incident with, and forming a continuation of, the axis of the cylindrical portion, or body. A little in rear of the point where the contraction begins, is located a spider-shaped partition, or skeleton-frame, composed of a plurality, usually three, of radial lugs, or extensions 4, uniting at equal intervals with a central boss 5. These parts may be, and preferably are, integral with the

burner, the whole being cast in one piece; but they may be of separate construction, if preferred, the spider being permanently united with the burner in any suitable manner. The boss 5, which is concentric, or nearly so, with the burner, projects some distance in rear of the point of attachment, or union, of its lugs 4 with the burner, and is provided with a recess 6, which is drilled concentric with the inner face of the body of the burner, the forward end of said recess being contracted, or tapered, to a small opening concentric with the recess 5. The interior of the latter is tapped to provide a female thread for the attachment of the end of the steam-pipe or fluid pipe, which enters from the rear. A second point of support for said pipe is provided by means of a spider-frame, consisting of a central ring 7 with three, or more, radial lugs 8. The latter are so formed as to abut against the inner face of the cylindrical body at the rear end, the central ring having its opening concentric with the cylindrical body, and of such size as to admit the steam-pipe or fluid pipe, and closely surround the same, to prevent all lateral play. The ends of the lugs 8 are tapped, or otherwise fitted, to receive the ends of set-screws 9, tapped through the wall of the burner, which is preferably formed with thickened portions, or bosses 10, to receive the set-screws. This frame, in conjunction with the boss 5, holds the steam-pipe in correct longitudinal alignment throughout its extent.

Beneath the forward end of the boss 5 is a pendant 12, preferably cast in one piece with the burner. It is provided with a threaded recess 13, to receive the end of the oil-pipe, the end of said recess, above the threaded portion, being contracted to the diameter of a passage 14, formed in one of the lugs, or extensions 4. The passage, or recess 14, is contracted still farther, at its upper end, to form an oil-discharge 15, which lies in the main channel, at the contracted opening at the forward extremity of the contracted end of the recess 6. In front of this contracted exit is placed the spreading-button 16, its peripheral face being that of a frustum of a cone of small altitude, thereby forming an annular, divergent passage, 16, of small width, through which the steam and atomized oil may escape at an angle with the axis of the burner, but inclining toward the open mouth 3, thereby causing a very complete admixture of the steam, oil and air, in the combustion-chamber inclosed by the contracted end of the burner. Air is supplied from the rear end, where it enters by its natural draft, passing between the lugs of the two spiders, and through the annular space intermediate of the burner and the steam-pipe. I usually provide a second and separate air-inlet, by either forming, or attaching, a terminal 17 opposite the oil-entrance and substantially at the point where the contraction of the forward end of the burner begins. This air-inlet is provided with

any suitable form of valve, by which the entering volume of air may be controlled, or cut off entirely.

With the parts formed in the manner described and shown, their assemblage is a simple matter, and need not require labor that is skilled in any degree; as any person who can handle a pipe-wrench can unite the parts of the burner with perfect success. The steam-pipe or fluid pipe is inserted through the ring 7 and its end screwed into the recess 6, in the boss 5, after which any rotary movement of said steam-pipe is prevented by means of one of the set-screws 9, which I form of such length that it will pass entirely through its lug 8 and the ring 7 and abut against the pipe. If preferred, more than one of these screws may have a like engagement, but ordinarily one will be sufficient. The oil-pipe is then screwed into the pendant 12, and the burner is thus completed, and no setting, or adjustment of the parts, is either necessary, or possible. Should the pendant 12 and terminal 17 be separately formed, however, they will require mounting, which will be accomplished, preferably, by tapping their ends into the wall of the burner, or other suitable manner. As the boss 5 and the lug 4, containing the communicating oil-passage, are formed in one piece, the relation of the oil-exit to the steam-exit or fluid-exits can not be varied, nor is it intended that such variation shall be feasible, for if the construction is properly and competently carried out, the relation of parts will be correctly established before the union of the other members is accomplished.

By my invention, I provide a mingling-chamber of maximum dimensions between the point of discharge and the point where contraction of the burner begins, said chamber being increased by the space inclosed by the contracted end. This chamber secures a thorough mingling and complete vaporization, and the perfect commingling and atomization are sufficient to secure a complete consumption of the products of said combustion at, and beyond, the open, contracted mouth, thereby affording intense heat without smoke, or odor.

It should be noted that I may, if circumstances require it, substitute a forced blast of air in place of the steam, using, for this purpose, the pipe referred to, in the foregoing description, as the steam-pipe. This substitution calls for no change in the construction of the burner.

Compressed air may be supplied through the said steam-pipe in any quantity and under any pressure, and may be used either with or without the natural draft of air, between the burner and steam pipe, and with or without the auxiliary air-draft by way of the terminal 17.

As the same part may be used for either steam, or air under pressure, I have referred to said part in the description and claims as

the steam pipe, or fluid pipe, or by the latter term only.

What I claim is—

1. A hydrocarbon burner, consisting of a casing having a contracted delivery mouth and an oil inlet, a removable spider support located at one end portion of the casing and comprising a central ring and radial lugs, set screws passing through the casing and engaging said lugs, a spider support located in the casing and provided with fluid and oil exit passages, and an oil passage leading to the oil inlet of the casing, and a fluid conducting pipe extending through the removable spider support and detachably engaged with the spider support having the fluid and oil exits, substantially as described.

2. A hydrocarbon burner, consisting of a casing having a contracted delivery mouth and an oil inlet, a spider support arranged at one end portion of the casing and comprising a center ring and radial lugs, a spider support arranged in juxtaposition to the oil inlet of the casing and formed with divergent exit passages 15 and 16^a, a spreading button 16 and an oil passage 14, and a fluid conduct-

ing pipe 2 extending through the spider support at the end portion of the casing and detachably engaged with the spider support having said exit passages, substantially as described.

3. A hydrocarbon burner, consisting of a casing 1 having a contracted delivery mouth 3, an oil inlet and an air inlet, a spider support arranged at one end portion of the casing and comprising a center ring and radial lugs, and a spider support located in coincidence with the oil inlet of the casing at a point in rear of the air inlet and formed with radial lugs and exit passages 15 and 16^a and an oil passage 14, and a fluid conducting pipe 2 extending through the spider support at one end portion of the casing and detachably engaged with the spider support having the exit passages, substantially as described.

In testimony whereof I have hereunto set my hand and affixed my seal in presence of two subscribing witnesses.

WILLIAM H. CLARKE. [L. s.]

Witnesses:

M. A. KURSHEEDT,
FRIEDA LEWINSON.