

J. H. BULLARD.  
HYDROCARBON BURNER.

No. 419,409.

Patented Jan. 14, 1890.

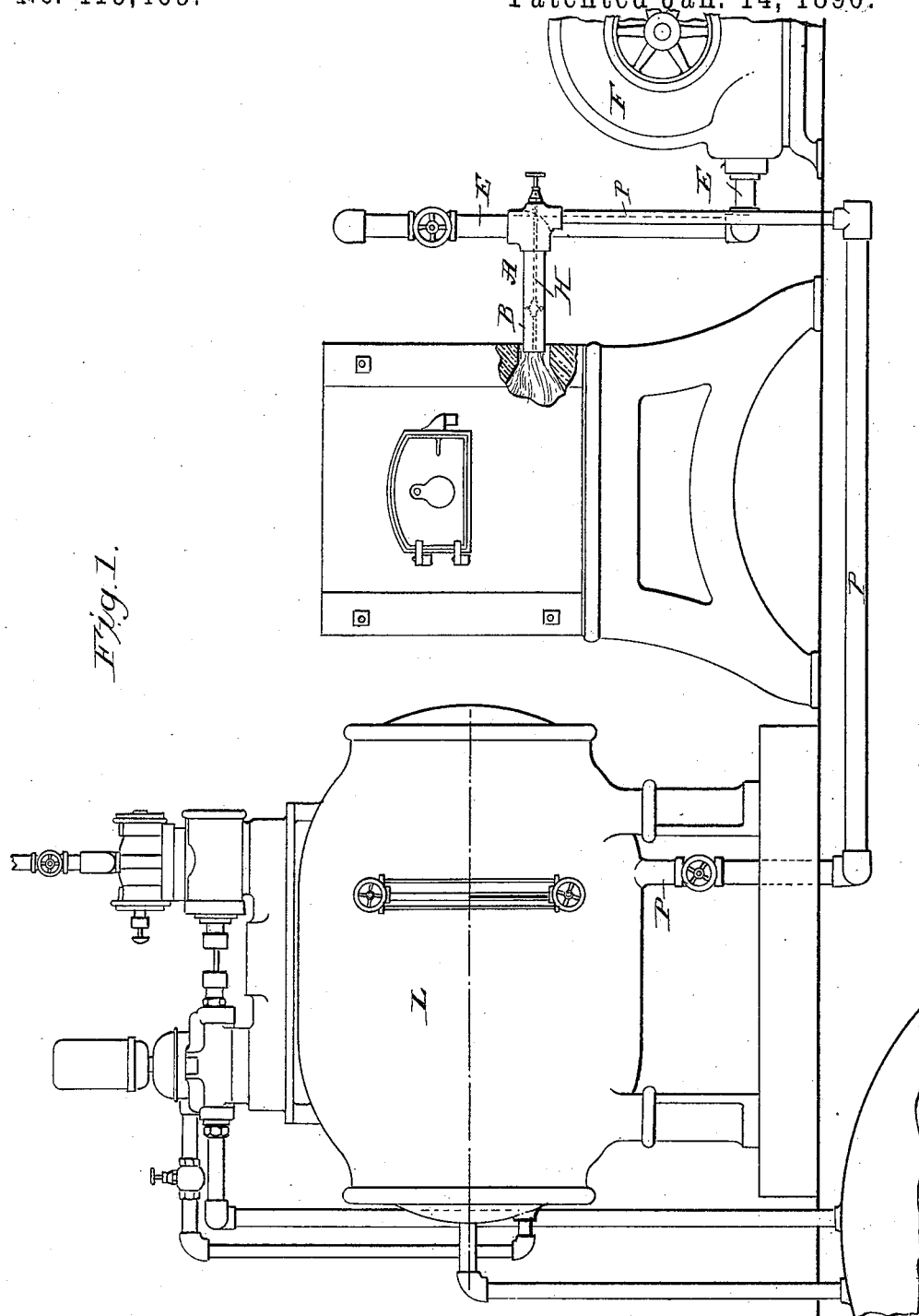


Fig. 1.

Witnesses:

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*Wm. L. Bellows*

Inventor,

*James H. Bullard*  
by *Chapman*  
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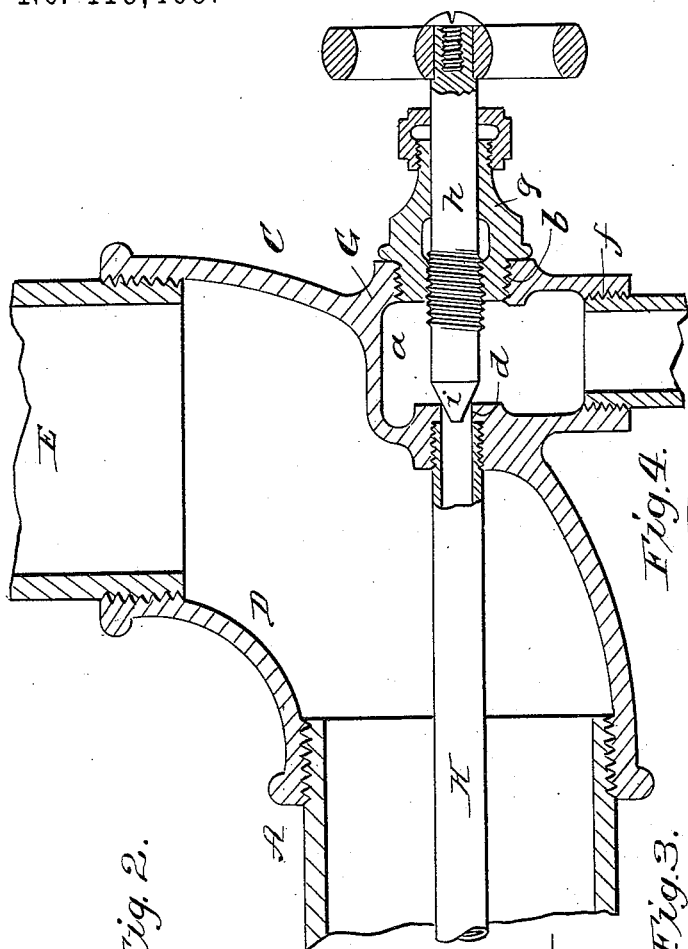


Fig. 2.

Fig. 4.

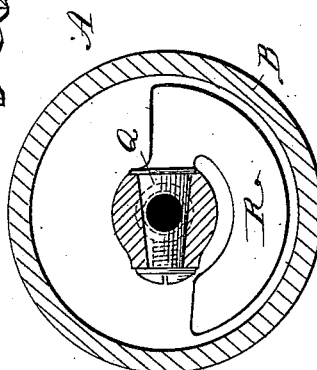


Fig. 3.

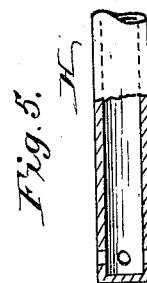
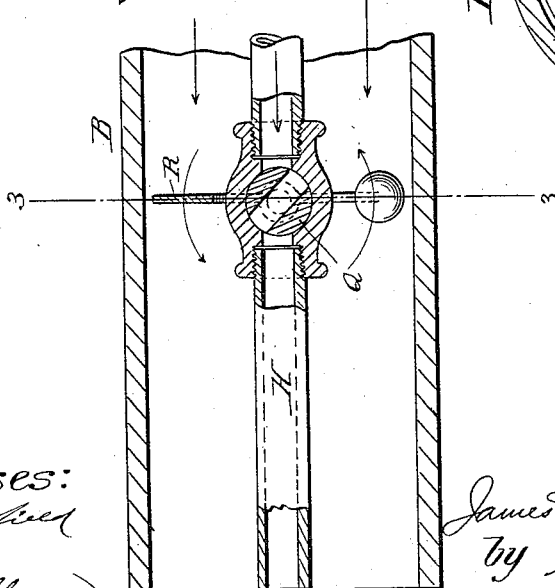
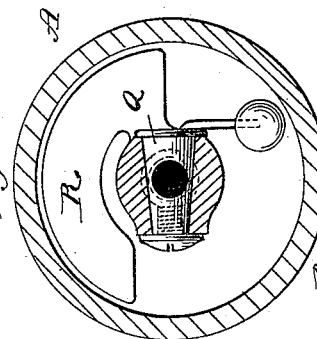


Fig. 5.

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# UNITED STATES PATENT OFFICE.

JAMES HERBERT BULLARD, OF SPRINGFIELD, MASSACHUSETTS, ASSIGNOR  
TO THE AERATED FUEL COMPANY, OF SAME PLACE.

## HYDROCARBON-BURNER.

SPECIFICATION forming part of Letters Patent No. 419,409, dated January 14, 1890.

Application filed June 6, 1889. Serial No. 313,261. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES HERBERT BULLARD, 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 Hydrocarbon-Burners, of which the following is a specification.

This invention relates to burners for hydrocarbon fuel, and especially such burners as are adapted to secure the combustion of oil in conjunction with air under pressure, the purpose of which invention being to provide a burner which will be automatically operative to deliver the hydrocarbon in quantities proportionate to the pressure and quantity of the air also forced through and discharged from said burner; and the invention consists in the construction and combination of parts, all substantially as will hereinafter more fully appear, and be set forth in the claims.

In the accompanying drawings the burner constructed according to this invention and one manner of its use are illustrated, similar letters of reference indicating corresponding parts in all the views.

Figure 1 is a side elevation of a forge-furnace to which aerated hydrocarbon is supplied for combustion therein through the burner which is shown in connection with said furnace. Said figure also comprises in elevation the storage-tanks and oil-conduits therefor between same and said burner, an air compressor or blower, and an air-conduit leading therefrom to the burner. One side of the forge-furnace is shown as partly broken away and in section for clearer illustration. Fig. 2 is a central vertical longitudinal section of the burner on an enlarged scale. Fig. 3 is a cross-sectional view of the same on the line 3 3, Fig. 1. Fig. 4 is a similar cross-section to Fig. 3, but showing a slightly-modified construction in detail; and Fig. 5 is a sectional view of a varied construction to be hereinafter referred to.

The burner A comprises a main longitudinal tube B and a coupling C at one end thereof, which consists, first, of a main elbow-shaped member D, (to one end of which said main burner-tube B is attached and at

the other is entered the pipe E from the air-compressor F,) and, secondly, of a supplemental coupling member G, which is located on the back or outer side of the member D, and which in itself comprises a central chamber *a*, having at each side thereof openings *b* *d* through its walls in the axial line of the said main burner-tube B, and also having through its wall another opening *f*, leading to any suitable part of said chamber. A gland *g* is screwed into said opening *b*, through which is entered a spindle *h*, having intermediate of its length a screw engagement with the axial bore of said gland, and said spindle is provided at its outer end with a handle, knob, or disk for conveniently turning it, and by its inner end portion extends across the said chamber *a*, its extremity being tapered, as at *i*, to fit within said opening *d* and to partially close its orifice to a greater or less degree, or to entirely close said orifice as the said spindle is screwed inwardly or outwardly. A tube H for oil, of much smaller diameter than the one B, is screwed into the said opening *d*, and extends with its axis coincident with that of the tube B to or about the outer end of said main tube, and has its said end open, as shown, or it may have its end closed and be provided with openings through its side near such end, as indicated by the view Fig. 5.

L represents a service-tank, in which oil is to be maintained at any desired or proper height, and said oil, through the pipe P, which connects with the opening *f* of the coupling member G, by gravity or under pressure, is supplied to the burner.

Q represents a straight-way plug valve or cock provided in the oil-tube H intermediate of its length, on the stem of which is secured a wing R, suitably weighted and normally, or when the burner is in disuse, adapted by its disposition to maintain the said valve closed, as shown in Fig. 2. In Fig. 3 the wing R is shown as projected above the said valve and to lie in the annular space within the main pipe B, a counter-weight being suitably affixed thereto for insuring the closure of the valve, while in Fig. 4 the wing is adjusted to constitute in itself a closing-weight.

Air from the blower F through the pipe E,

being forced under any desired degree of compression into the pipe, in its passage through said pipe impinges against the wing R of the plug-valve, swinging same forward to open the said valve, and thereby permit the egress of a quantity of oil, it being of course understood that the valve is to be adjusted so that at the time of a maximum air-pressure a maximum and proportionate quantity of oil may be permitted to issue from the burner, while at the time of a decreased air-pressure a correspondingly less quantity of oil will be permitted to escape, and therefore by merely regulating the air-pressure the quantity of oil to be consumed may also be regulated, which quantity of oil, as has already been implied, will be in that direct proportion to the amount of air in conjunction with which the oil is burned as will insure the most perfect and efficient combustion.

What I claim as my invention is—

1. A hydrocarbon-burner consisting of a pipe adapted at one end to be connected with an air-conduit and open at its other end, a tube of smaller diameter supported within said air-pipe, adapted by one end to be con-

nected with an oil-conduit, having an opening at its outer end, and provided within its passage with a self-closing cock which has an extension outside of said oil-tube, provided with an operating-wing that is adapted to be moved to open the cock by the air-pressure in said air-tube, substantially as described.

2. In an apparatus for burning hydrocarbon, a burner comprising an air-pipe open at its forward end, an oil-tube of smaller diameter supported within said air-pipe, having an opening at its forward end, and provided within its passage with a self-closing cock which has an extension outside of said oil-tube, provided with an operating-wing that is adapted to be moved to open the cock by the air-pressure in said tube, combined with an air-compressor and a conduit leading therefrom and connected with said burner air-pipe, and an oil-tank and a conduit leading therefrom and connected with said burner oil-tube, substantially as described.

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Witnesses:

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