(No Model.)

T. VOS BURGH.

HYDROCARBON BURNER.

No. 547,365. Patented Oct. 1, 1895.

Fig. 1.

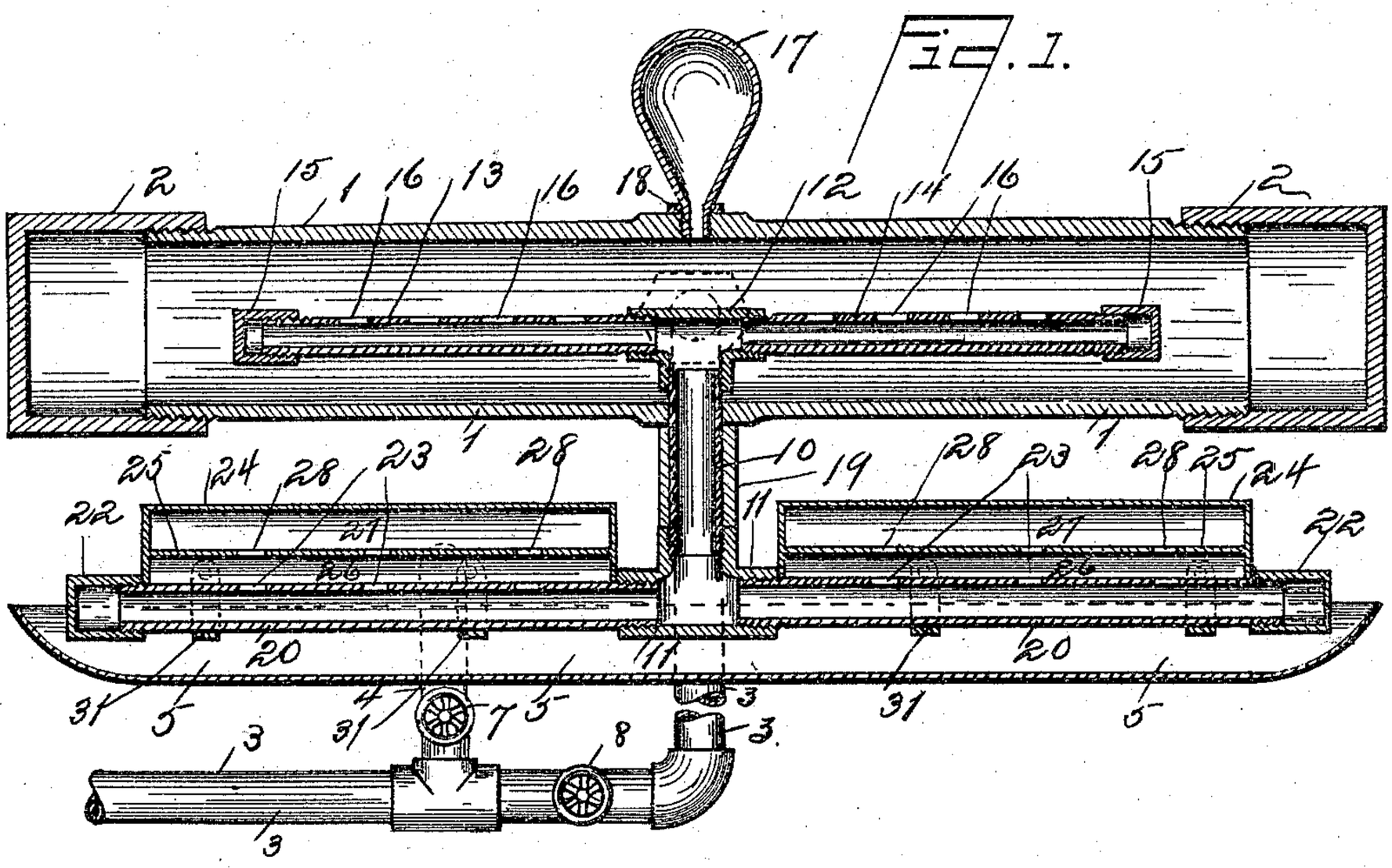


Fig. 2.

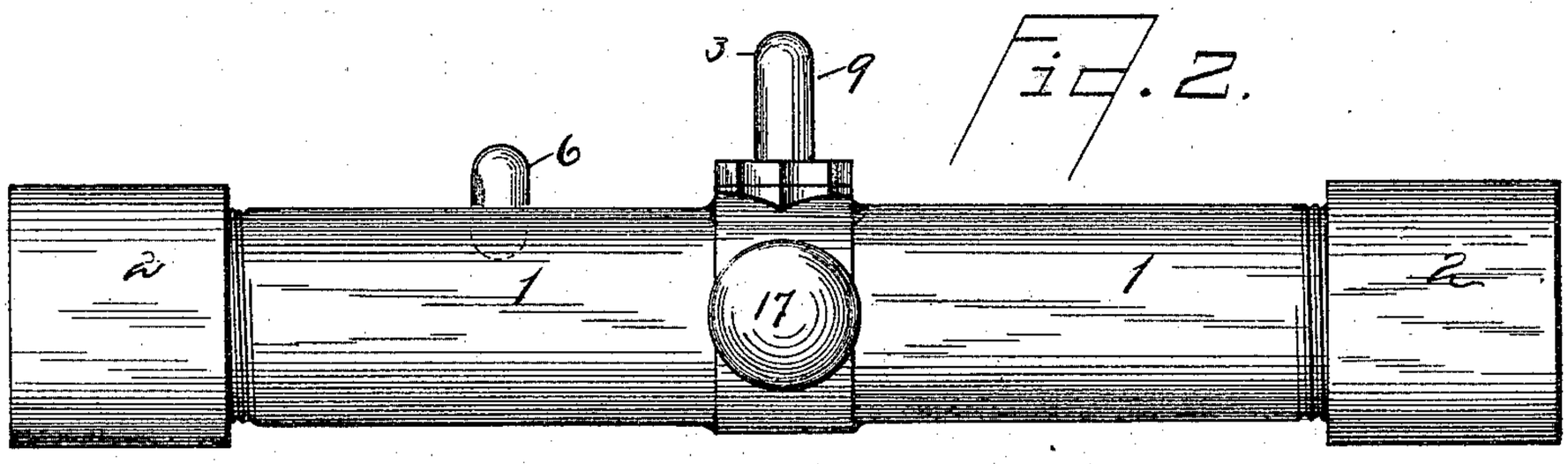


Fig. 4.

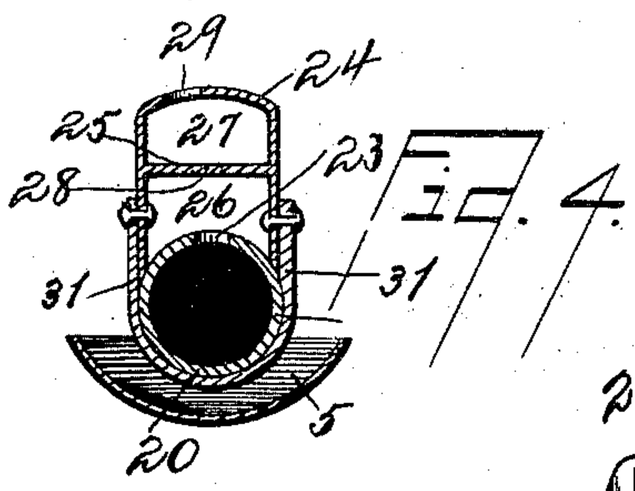
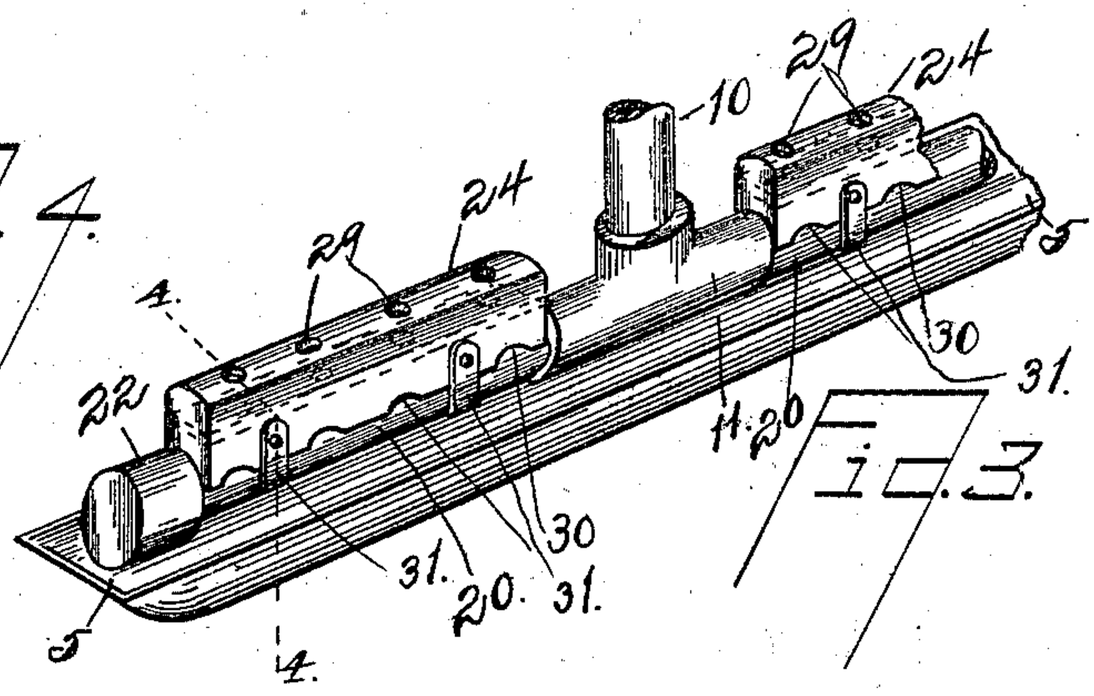


Fig. 3.



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UNITED STATES PATENT OFFICE.

THEODORE VOS BURGH, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-HALF TO JENNIE VIEVE TALBOT, OF SAME PLACE.

HYDROCARBON-BURNER.

SPECIFICATION forming part of Letters Patent No. 547,365, dated October 1, 1895.

Application filed October 15, 1894. Serial No. 525,874. (No model.)

To all whom it may concern:

Be it known that I, THEODORE VOS BURGH, of the city of St. Louis, State of Missouri, have invented certain new and useful Improvements in Hydrocarbon-Burners, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to an improved hydrocarbon-burner; and it consists in the novel construction, combination, and arrangement of parts hereinafter described, and designated in the claims.

The object of my invention is to provide an improved hydrocarbon-burner to be placed in stoves and furnaces, and which shall possess superior advantages in economy in the use of oil, which shall operate for a comparatively long period of time without becoming clogged with sediment, which may be readily taken apart for cleaning or repair, and which shall produce a very steady flame.

Referring to the drawings, Figure 1 is a sectional front elevation of a burner embodying my invention. Fig. 2 is a plan view of the same. Fig. 3 is a perspective view of a portion of the burner. Fig. 4 is a transverse section on the line 4 4 of Fig. 3.

1 indicates a horizontal generating-chamber, preferably of cylindrical form, and having caps 2 threaded upon its opposite ends.

3 indicates a single supply-pipe, through which the entire supply of oil is fed from any common reservoir or oil-can. The feed-pipe 3 is provided with a vertical extension 4, which passes upward to a point above the upper edge of a common lighting-pan 5, and is there provided with a curve or elbow 6, which projects over the edge and above said pan, so that oil may be discharged into the latter in starting the burner. The extension 4 is provided with a common valve 7 for controlling the passage of oil to the pan. The supply-pipe 3 is also provided with a common valve 8, which is located at a point in said pipe between the burner and the point at which the extension 4 is connected, so that the supply of oil to the burner may be regulated. The supply-pipe 3 passes upward at one side of the burner and is provided with a curve or elbow 9, which is connected to the side of the generating-chamber 1 by any common form of tight joint, so that oil may be discharged into said chamber. The point of discharge is, it will be observed, located about midway of the height of said chamber.

10 indicates a short vertical pipe, the lower end of which is threaded into a T-coupling 11, and the upper portion of which is connected to the under side of the generating-chamber 1. The upper portion of said vertical pipe 10 projects a distance upon the interior of said chamber, is screw-threaded, and carries another T-coupling 12.

13 and 14 indicate two small horizontal tubes, the opposite ends of each of which are screw-threaded, and one end of each is screwed within the T-coupling 12 within the generating-chamber 1, so that said tubes extend in alignment within said chamber. The outer free ends of said tubes are temporarily closed by common screw-caps 15. The tubes 13 and 14 are located in about the same vertical plane as is the center of the discharge-opening of the supply-pipe elbow 9. In the upper sides of said tubes 13 and 14 a series of apertures 16 are formed in about the same vertical plane. The tubes 13 and 14 are termed the "sediment-separator."

17 indicates a pear-shaped hollow equalizing-chamber, which is provided with a screw-threaded neck 18 at its lower end, which is threaded through the wall of the generating-chamber, so that the interior of said equalizing-chamber is in constant communication with the interior of said generating-chamber. The equalizing-chamber 17 is preferably located in a vertical position directly above the T-coupling 12 at a point centrally of the length of said generating-chamber.

19 indicates a protective covering, which completely covers the outer surface of the short vertical tube 10 to protect the same from undue heating or burning occasioned by contact with the flame and also to prevent undue heating of the gas or vapor in said vertical tube. This covering may be of any suitable material, its upper end resting in contact with the generating-chamber 1 and its lower end resting upon the T-coupling 11.

20 and 21 indicate horizontal jet-tubes, the opposite ends of which are screw-threaded,

the inner ends of which are threaded into the ends of the T-coupling 11 and the outer ends of which are closed by common screw-caps 22. Formed in the upper side of the jet-tubes 20 and 21 in the same vertical plane is a series of discharge-apertures 23. Said jet-tubes are located directly above the lighting-pan 5. An air-mixing and combustion hood 24 is fixed upon the upper side of each of said jet-tubes. As the construction of each of said hoods is identical, I will describe but one of them. The hood 24 is preferably formed of some suitable fireproof material, such as iron, steel, or fire-clay. It is composed of a hollow chamber which has a length a number of times in excess of its transverse dimensions and is preferably of a length equal to the distance between the T-coupling and the cap 22 of the jet-tube, above which it is placed. Its ends are both closed. In cross-section its upper side is preferably convexed or bulged, while its under side is open, but curved laterally to fit upon the outer surface of the jet-tube. The hood is provided with a horizontal partition 25, which extends from end to end and practically separates its interior into two chambers, one of which is above the other. The lower chamber 26 is what I term the "mixing-chamber," and the upper chamber 27 is the regenerating-chamber. The mixing-chamber 26 is in constant communication with the interior of the jet-tube by way of the apertures 23, and the regenerating-chamber is in constant communication with the mixing-chamber by way of a series of apertures 28, formed in the horizontal partition 25 directly above said apertures 23, and the interior of the regenerating-chamber 27 is in communication with the atmosphere by way of a series of apertures 29, formed in the convex upper side of the hood. The apertures 29 are preferably set, as indicated in Fig. 4, a little to one side of a vertical line drawn through the center of the end of said regenerating-chamber, so that when my improved hydrocarbon-burner is placed within a cook-stove or range the gas or vapor will be discharged from the apertures 29 in inclined or oblique jets and be directed upward against only one side of the generating-chamber 1, as I have found that when said jets are ignited said chamber will be made amply hot, and by directing the jets rearward or next adjacent to the oven of the stove or range the flame will be very effectually directed toward said oven instead of being discharged one half on one side of the burner adjacent the oven and the other half on the opposite side of the burner in a direction away from the oven. By this arrangement I direct more heat toward the oven than if the jets were discharged in a vertical line.

Formed in the lower edge of the hood 24 are a series of recesses or openings 30, which provide spaces or openings for the entrance of air to the mixing-chamber 26. The hood is clamped in position upon the jet-tube by means of common straps 31, which are bent around beneath said tube and have their upper portions riveted or secured by common screws to the sides of said hood. (See Fig. 4.)

The operation is as follows: When it is desired to light the burner the valve 7 is slightly opened, thereby permitting a suitable quantity of oil to be discharged into the lighting-pan, and then said valve should be closed and the oil in the pan lighted. The flame arising from the pan will come in contact with the jet-tubes 20 and 21, hoods 24, and the generating-chamber 1, and will heat all of said parts to a sufficient degree to vaporize any oil which is deposited in said generating-chamber; then the valve 8 is opened, permitting a sufficient quantity of oil to flow from the supply-pipe 3 to the generating-chamber 1. The oil contained in said generating-chamber will be heated to a high degree and a considerable amount of the sediment carried by said oil—such as paraffine or dirt—will settle upon the bottom of said generating-chamber, an at the same time a suitable quantity of vapor will be generated in said chamber and will pass therefrom through said apertures 16 in said sediment-separator to the interior of the latter, and thence downward through the vertical pipe 10 to the jet-tubes 20 and 21. The apertured upper side of said sediment-separator acts as a sort of strainer to strain out the larger particles of sediment and gum which might otherwise pass to the jet-tubes and obstruct the apertures therein. This sediment may be readily removed from time to time by detaching the caps 2 of said generating-chamber, and any sediment which collects within said sediment-separator may also be readily removed by detaching its caps 15 after said caps 2 have been removed. The vapor that is discharged into the jet-tubes is discharged therefrom in the form of jets into the mixing-chambers 26, directly above said jet-tubes, and said jets create a partial vacuum within said mixing-chambers and draw in air through the recesses or openings 30 at the base of said mixing-chambers, which air will commingle with the vapor and be discharged upward from said mixing-chambers through the apertures 28 into the regenerating-chambers 27, which chambers being highly heated by the flame, raise the temperature of the commingled vapor and air to a sufficiently high degree to cause a union thereof and place both vapor and air in a better condition for combustion; then these highly-heated matters are forcibly discharged in the form of jets from said regenerating-chambers through the inclined apertures 29 in the top of said regenerating-chambers and they strike the generating-chamber 1. The jets thus issuing are to be lighted, and after they are ignited will keep the temperature of said generating-chamber 1 and said regenerating-chambers sufficiently high to prolong the above-described action as long as a suitable supply of oil is discharged into the said gen-

erating-chamber. The straps 31 may be removed from the jet-tubes at any desired time, thereby releasing the hoods 24 and the parts located therein for the purpose of cleaning and repair.

I have discovered by actual practice that by combining the heated vapor with air in the manner above described enables me to operate my improved burner with less oil than would be required if the hoods 24 were omitted in accordance with the well-known laws of combustion.

The equalizing-chamber 17 acts in a manner similar to that of an ordinary air-chamber on a force-pump, it being connected to the generating-chamber 1 by means of a restricted passage, so that it equalizes the pressure within said generating-chamber and prevents injurious fluctuations of pressure therein, thereby causing the vapor to be discharged into the jet-tubes in a steady stream, obviating in a great measure the undesirable succession of "puffs" which might otherwise be caused by the unequal pressure within said generating-chamber. When the pressure within the generating-chamber increases, a portion of it is transferred to the interior of said equalizing-chamber, and then when pressure within said generating-chamber decreases a portion of the pressure within said equalizing-chamber is immediately returned to said generating-chamber.

What I claim is—

1. In an improved oil burner, the combination of a horizontal generating-chamber 1, caps 2 detachably mounted upon the ends of said chamber, an oil-supply pipe 9 connected to said generating chamber at a point intermediate of the bottom and top thereof, an oil-strainer or sediment-separator 13, 14, in the form of a horizontal tube mounted within said separating chamber and having a series of inlet-apertures in its upper side which are located in substantially the same vertical plane as is the opening of the said oil-supply pipe, the opposite ends of said strainer being closed, means for holding said strainer in said position, and a pipe connecting the interior of said strainer with the interior of the said jet-tube, whereby oil may flow from the oil-supply pipe 9 into said generating-chamber, thence through the apertures of the said strainer, and thence to the said jet-tube, substantially as herein specified.

2. The improved regenerating oil burner, comprising a generating chamber, an oil-supply connection, a jet-tube beneath said generating chamber and connected to the latter, said jet-tube having discharge apertures 23 in its upper side, a detachable air-mixing and combustion hood 24 the opposite ends of which are closed and the upper side of which is convexed or bulged, while its under side is open but curved laterally to fit upon the outer surface of said jet-tube, the lower edges of said hood at the point of demarkation between itself and said jet-tube being provided with a series of air-inlet recesses 30, the horizontal partition 25 upon the interior of said hood having a series of apertures 28 located in vertical alignment with the apertures in the upper side of said jet-tube, the convexed or bulged upper side of said hood being provided with perforations 29, and suitable fastenings whereby said hood is removably clamped in position upon the said jet-tube, substantially as herein specified.

In testimony whereof I have affixed my signature in presence of two witnesses.

THEODORE VOS BURGH.

Witnesses:

M. G. IRION,

JNO. C. HIGDON.