

No. 609,855.

Patented Aug. 30, 1898.

D. WARD.
HYDROCARBON BURNER.

(Application filed Nov. 18, 1897.)

(No Model.)

Fig. 1.

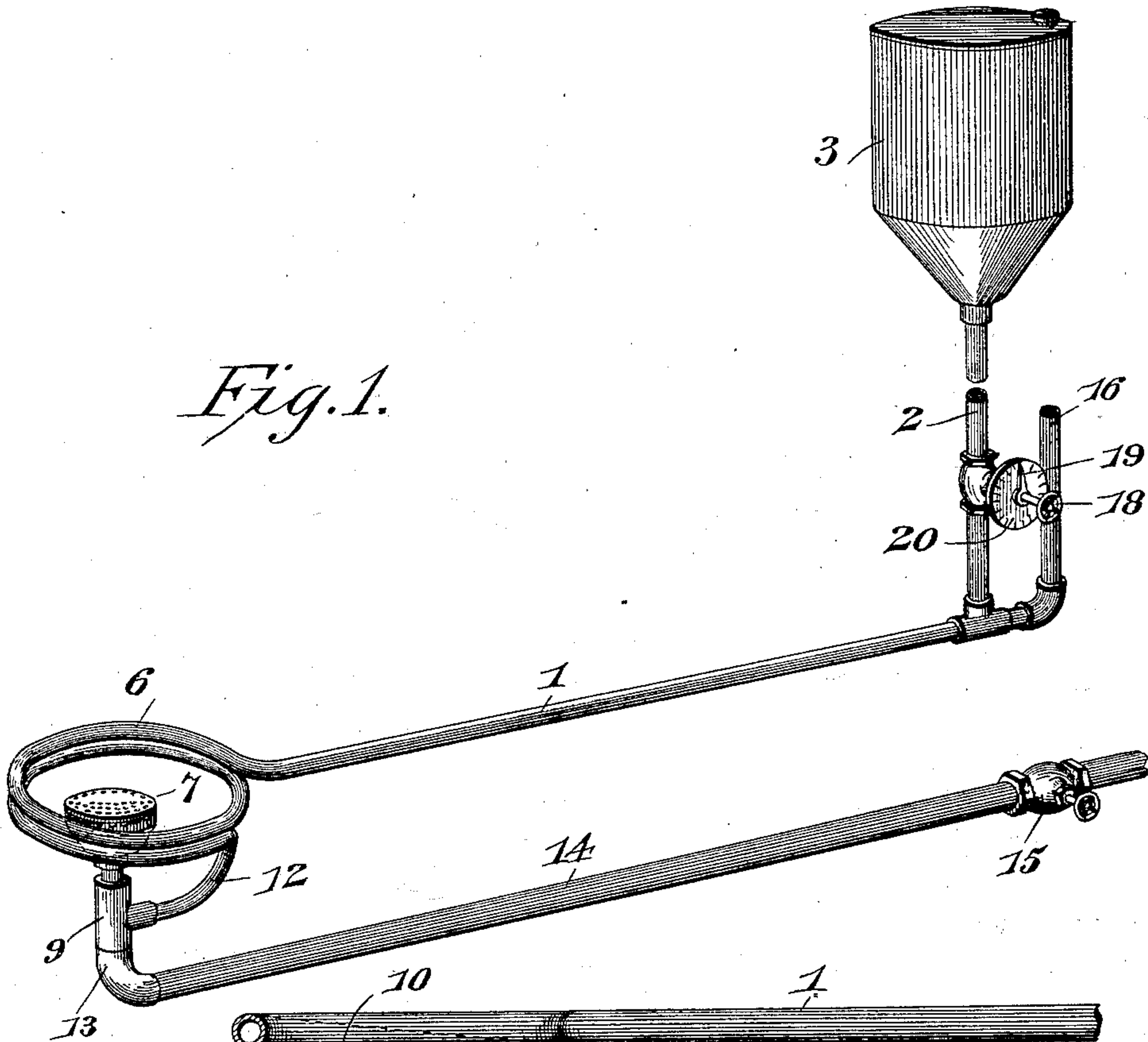


Fig. 2.

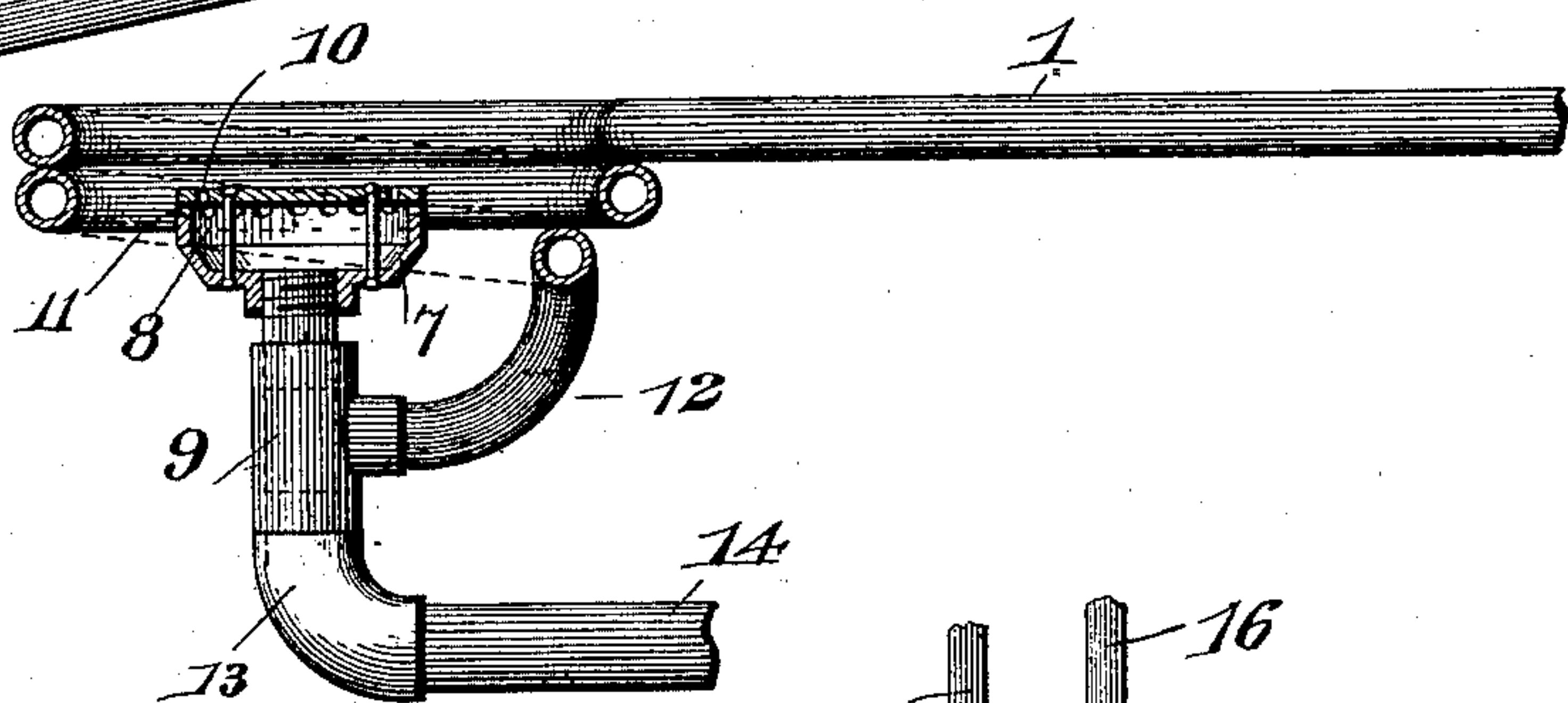
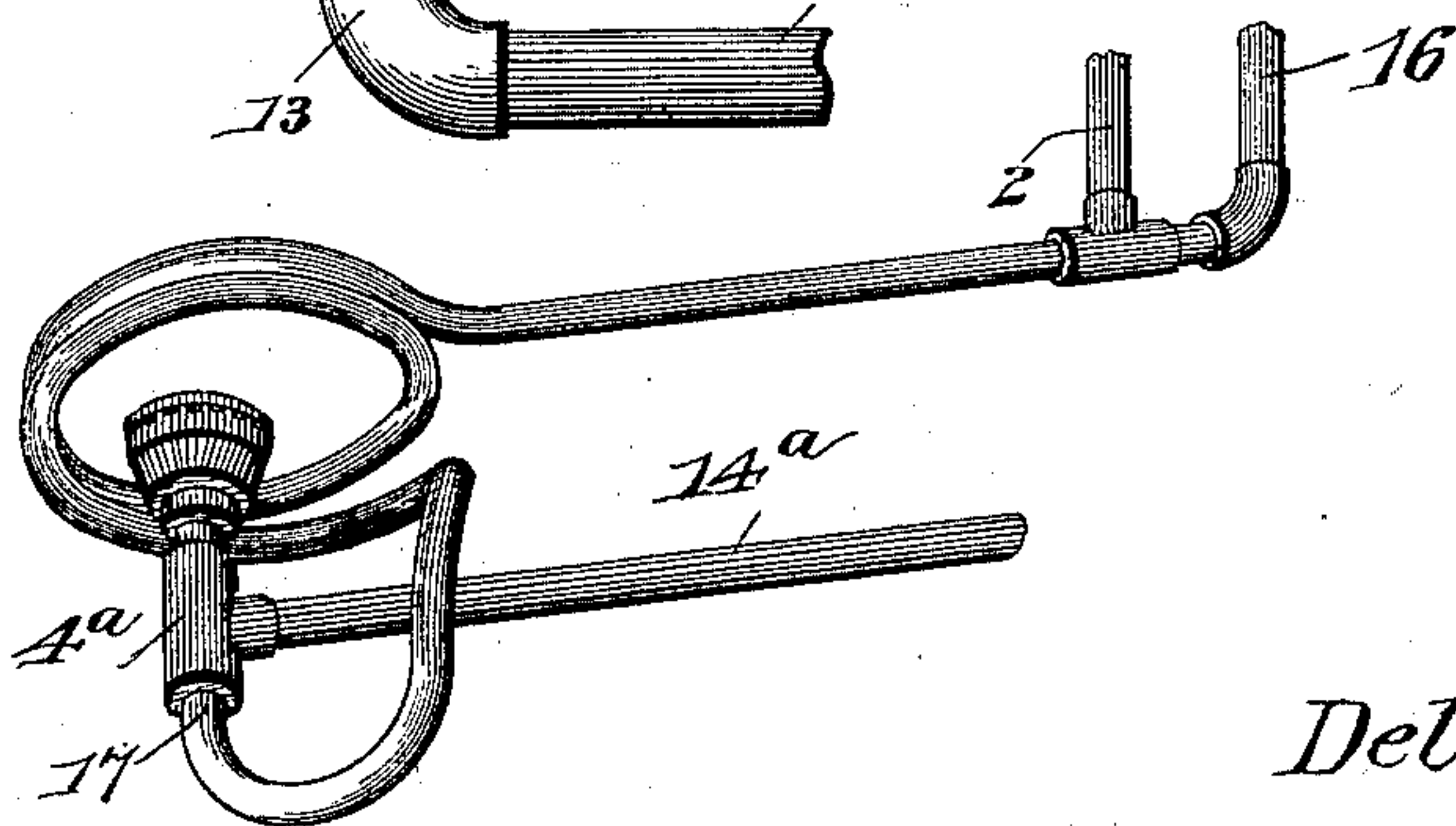


Fig. 3.



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Witnesses

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UNITED STATES PATENT OFFICE.

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HYDROCARBON-BURNER.

SPECIFICATION forming part of Letters Patent No. 609,855, dated August 30, 1898.

Application filed November 18, 1897. Serial No. 659,010. (No model.)

To all whom it may concern:

Be it known that I, DELL WARD, a citizen of the United States, residing at Toledo, in the county of Lucas and State of Ohio, have
5 invented a new and useful Hydrocarbon-Burner, of which the following is a specification.

My invention relates to hydrocarbon-burners, and particularly to a heating device designed for using kerosene as a fuel and adapted especially for use in heating the metal in
10 connection with linotype-machines of the Mergenthaler type.

The object of the invention is to provide
15 the burner with a coiled or analogous vaporizing-retort through which the fuel is "float-ed" or fed by a blast of low pressure which, however, is constant and which is designed not only to induce a steady flow of the fuel,
20 but to insure the mixture with the fuel-vapor of a quantity of heated oxygen, and also to prevent the carbonizing of the fuel upon the walls of the retort.

Further objects and advantages of this invention will appear in the following description, and the novel features thereof will be particularly pointed out in the appended
25 claims.

In the drawings, Figure 1 is a perspective view of a burner constructed in accordance with my invention. Fig. 2 is a side view, partly in section, of the same. Fig. 3 is a detail view showing a slightly-different arrangement of the mixer-inlets.

30 Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

Communicating with a feed-pipe 1 is a fuel-supply pipe 2, through which fuel is fed under pressure, as by arranging the fuel tank or reservoir 3 above the plane of the feed-pipe. The feed-tube 1 is connected with and preferably extended to form a vaporizing-coil or retort 6, surrounding a space in which is
45 arranged the burner-tip or outlet 7, which in this case consists of a chamber 8 in communication with a mixer 9 and having in its upper wall a plurality of openings 10 and in its side wall a series of perforations 11. The top
50 of the burner-tip or outlet is preferably arranged slightly below the plane of the uppermost coil 6, and the tube forming the coil is extended beyond the latter, as shown at 12, for communication with the side of the mixer

9. The mixer 9 is provided with a terminal
55 inlet-opening 13 for a combustion-supporting agent which may be inducted, as in the ordinary practice, by the discharge of vaporized fuel through the mixer; but I have found in practice that the efficiency of the burner
60 is increased and the attainment of a complete combustion of the fuel is facilitated by providing means for supplying the combustion-supporting agent, such as atmospheric
65 air under pressure, as through an air-supply pipe 14, and as the rapidity with which the combustion-supporting agent is supplied should be varied in proportion to the amount of fuel consumed this air-supply pipe is preferably provided with a controlling-valve 15.
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It is possible to operate the burner, as hereinbefore described, particularly when the supply of fuel is small, without the use of the forced air-supply through the pipe 14, inasmuch as a mixture of atmospheric air with
75 the fuel-vapor is attained by reason of an air-supply pipe 16 in communication with the feed-pipe 1 on the opposite side of the fuel-supply pipe from the vaporizing-coil, the supply of air from the pipe 16 being in an
80 axial direction with relation to the feed-pipe. The combustion-supporting agent admitted through the supply-pipe 16 is preferably under a constant pressure, an efficient pressure being two ounces to the square inch, and inas-
85 much as this blast of air is admitted in rear of the point of communication of the fuel to the feed-pipe it has the effect of floating or feeding the fuel into the vaporizing-coil and of mixing intimately with the vapor of said
90 fuel as generated. Furthermore, by floating the fuel into the vaporizing-coil by means of a constant blast of a combustion-supporting fluid (atmospheric air or the equivalent thereof) it becomes unnecessary to fill the
95 feed-pipe and vaporizing-coil with the liquid fuel in order that the feeding of such fuel may be insured. The blast carries the fuel into the coil and at the same time becomes mixed therewith, whereby when the fuel is
100 vaporized the intermixture therewith of the combustion-supporting agent is accomplished in the vaporizer with the supporting agent at a high temperature, corresponding with the fuel-vapor.
105

A further advantage of this construction resides in the fact that the deposit of carbon upon the walls of the vaporizing-coil is pre-

vented, such deposit in connection with the burners wherein the vaporizing-retort is filled with fuel being due to an excessive quantity of the fuel and resulting in interfering with the subsequent operation of the burner. Where the fuel is mixed with and carried into the vaporizing-coil by means of a blast of combustion-supporting agent, vaporization takes place without this deposit of carbon, and thus the frequent cleaning of the interior of the vaporizing-coil is avoided.

As above indicated, the burner embodying my invention may be operated in connection with the constant blast of combustion-supporting agent admitted through the air-supply pipe 16 without the use of the auxiliary variable blast of combustion-supporting agent admitted through the supply-pipe 14, (when the supply of fuel is slow;) but when a large quantity of fuel is being consumed, as when a large flame is required at the burner-tip, I have found it desirable to employ this auxiliary variable blast of combustion-supporting agent admitted to the mixer, and thus combining with the heated mixture of fuel-vapor and combustion-supporting agent contiguous to the point of ignition and by varying this auxiliary blast of air to suit the rapidity at which the fuel is fed to the burner the desired condition of flame can be attained to produce the most satisfactory results.

The feed-pipe 1, with its continuation 6, forming the coiled retort, is preferably of a diameter corresponding with that of the air-supply pipe 16, and in practice the fuel is admitted into the approximately horizontal portion of this pipe 1 drop by drop, and is carried forward or floated by the column of air to the coiled retort and thence to the burner to avoid the accumulation of obstructions in the conveyers. The coil 6 should not be arranged in the direct upward path of the flame of the burner, to avoid overheating of the fuel and causing it to bake, which would choke the passage through which the fuel is conveyed to the burner. Furthermore, the burner proper, which I have designated as the "burner-tip," is provided with an enlarged cavity or chamber 8, constituting a catch-basin, arranged at the upper end of the vertically-disposed mixer 9 to receive and hold in solid particles all foreign matter which may be admitted thereto, such particles being held out of the path of fuel, and hence offering no obstacle to the operation of the burner. It is obvious that this catch-basin may be removed from the mixer at intervals to discharge such accumulations.

In Fig. 3 I have shown a different relative arrangement of the fuel and air inlets of the mixer, wherein the fuel-inlet 17 is at the end of the mixer 4^a, while the supply-pipe 14^a for the variable blast communicates with the side of the mixer to discharge laterally thereinto. The effect of this reversal of inlets, however, is not essential to the operation of the burner, except that with the arrangement

shown in Fig. 2 the blast of air passing axially through the mixer has the effect of inducing the fuel from the vaporizing-coil by suction.

As a preferred means of controlling the rapidity at which the fuel is fed to the burner I employ a regulating-valve 18, of which the same carries a pointer 19 to traverse a dial 20, whereby the dial may be set repeatedly at the same adjustment and whereby the extent of opening is indicated comparatively.

Various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

Having described my invention, what I claim is—

1. The herein-described fluid-fuel burner having a vertically-disposed mixer terminating at its upper end in a burner-tip, an approximately horizontal feed-pipe extended and coiled concentrically with the burner-tip, and approximately in the plane of the outlet thereof, to form a retort, which is further extended to constitute a fuel-pipe in communication with the mixer, means for communicating a constant blast of combustion-supporting agent to and in alinement with said feed-pipe, a fuel-supply pipe entering the feed-pipe transversely and provided with means for regulating the flow of liquid fuel therethrough, and an air-supply for communicating a variable blast of combustion-supporting agent to the mixer, one of the parts which communicates with the mechanism being arranged to enter the same axially and the other laterally, substantially as specified.

2. The herein-described fluid-fuel burner having a tubular vertically-disposed mixer, an enlarged burner-tip communicating with the mixer at its upper end and having an interior cavity forming a catch-basin, an approximately horizontal feed-pipe extended and coiled concentrically with the burner-tip and approximately in the plane of the outlet thereof to form a retort, which is further extended to form a fuel-pipe in communication with said mixer at its side, a blast-pipe communicating axially with the feed-pipe and corresponding in diameter therewith, a valved supply-pipe communicating transversely with the feed-pipe at a point remote from the coiled retort, and an air-pipe for communicating a variable blast of combustion-supporting agent to the mixer, and communicating axially with the latter, said air-pipe being provided with blast-controlling means, substantially as specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

DELL WARD.

Witnesses:

G. W. DISBROW,
WM. E. ROONEY.