No. 806,308. PATENTED DEC. 5, 1905.

R. H. WHITE.

GASOLENE BURNER.

APPLICATION FILED DEC. 3, 1900.

2 SHEETS—SHEET 1.

Fig. 1.

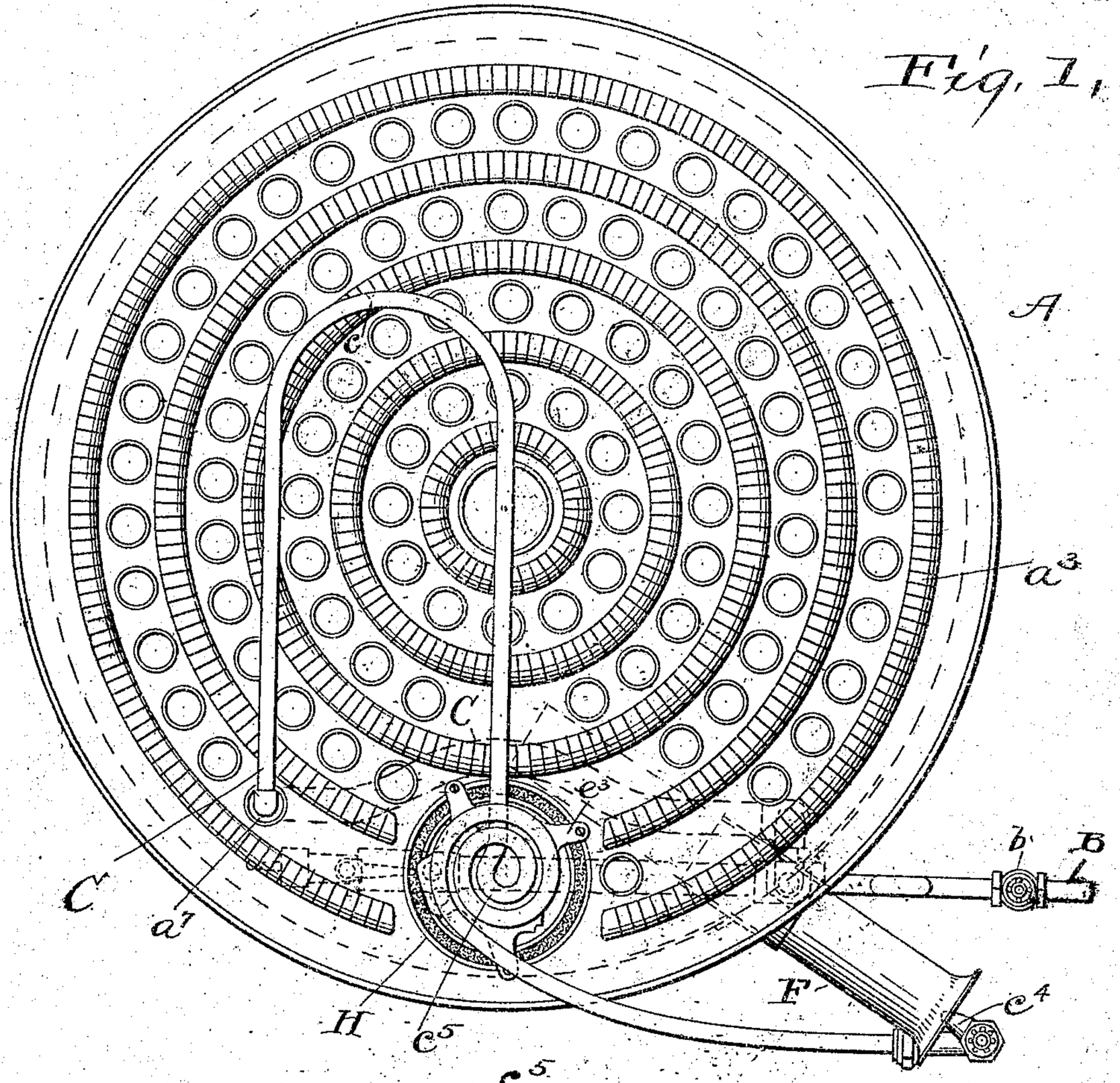
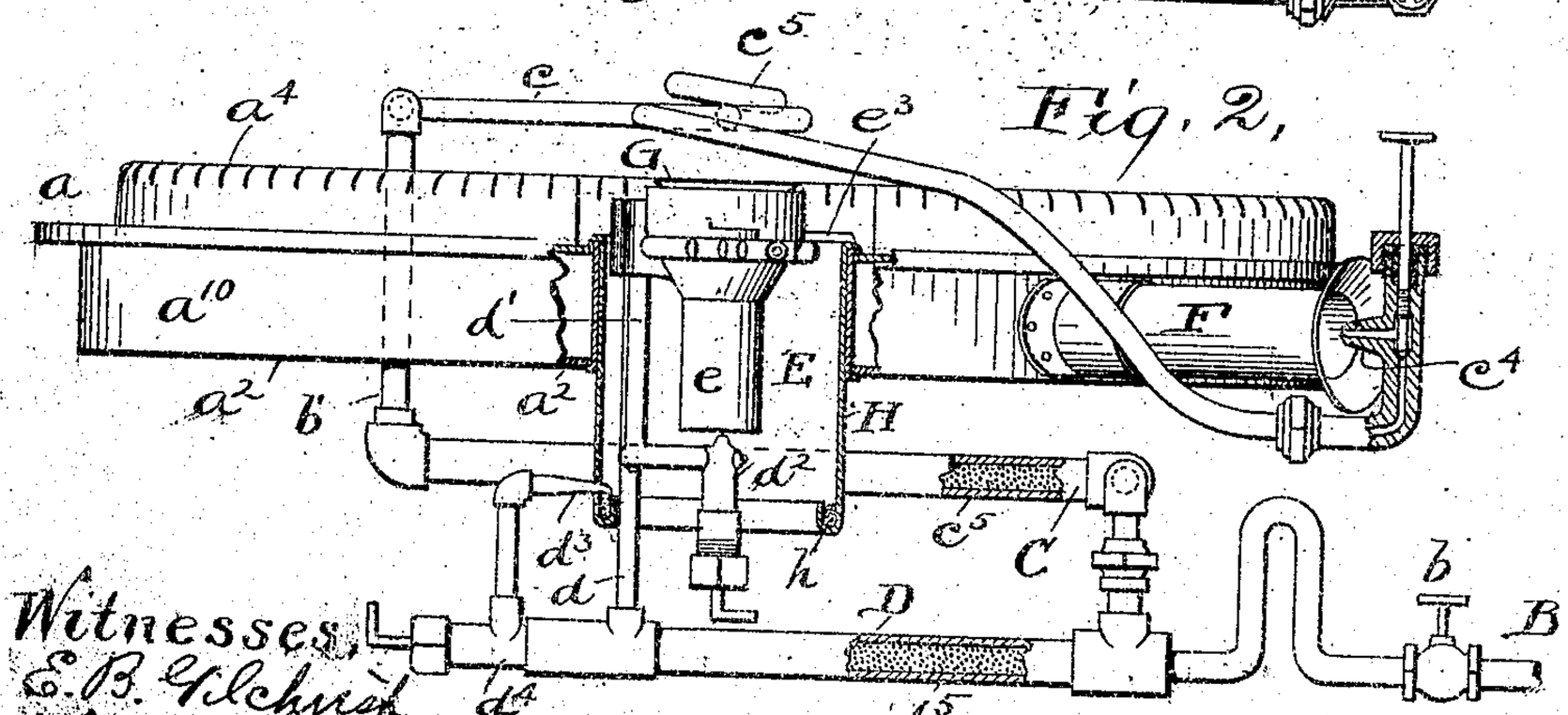


Fig. 2.



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Inventor,
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2 SHEETS—SHEET 2.

Fig. 3,

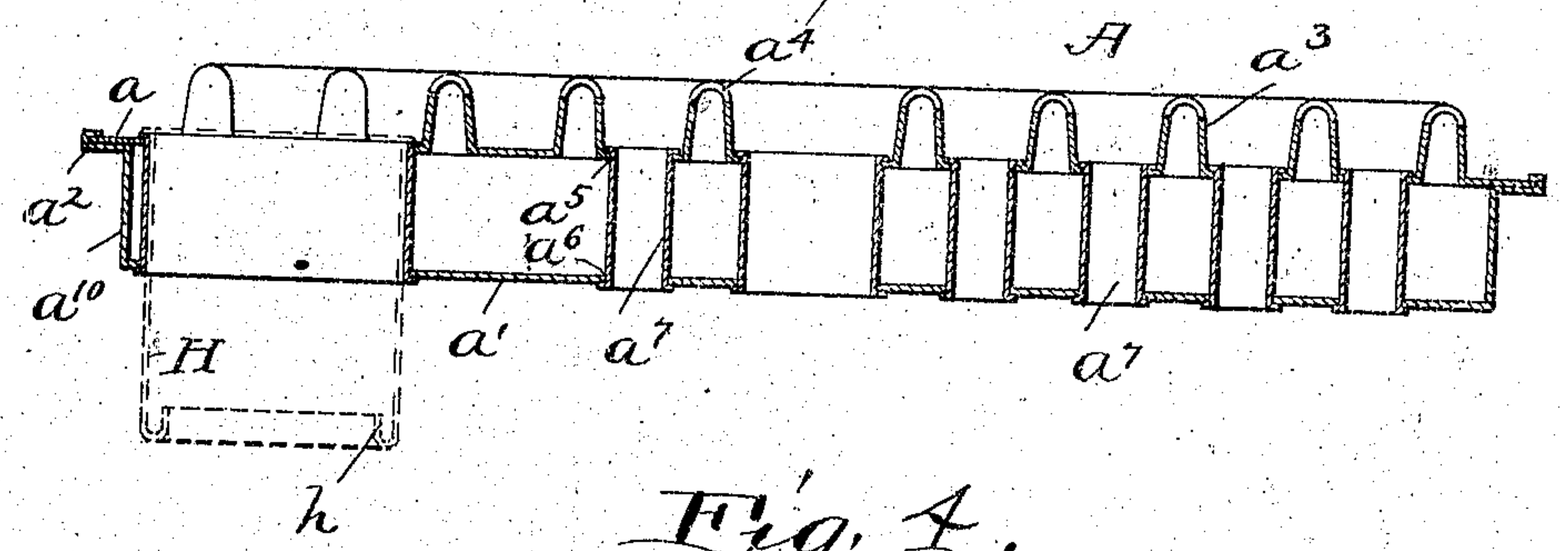


Fig. 4,

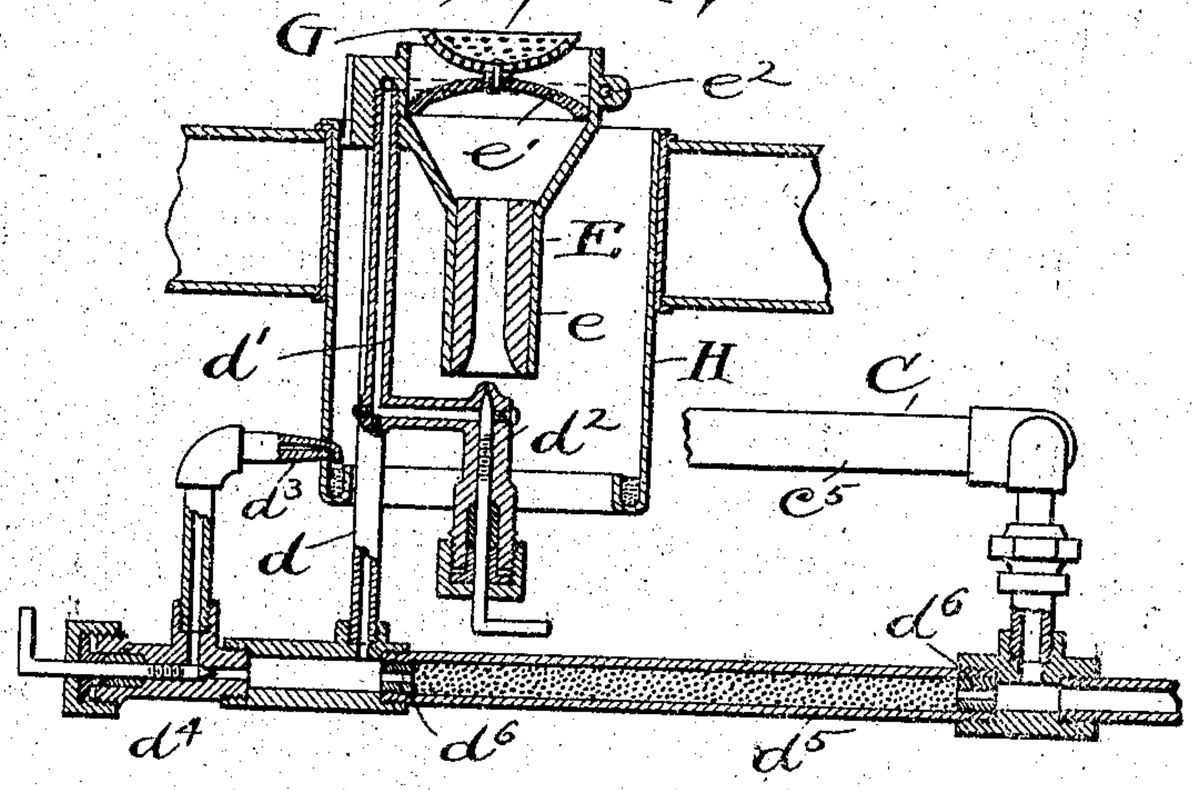
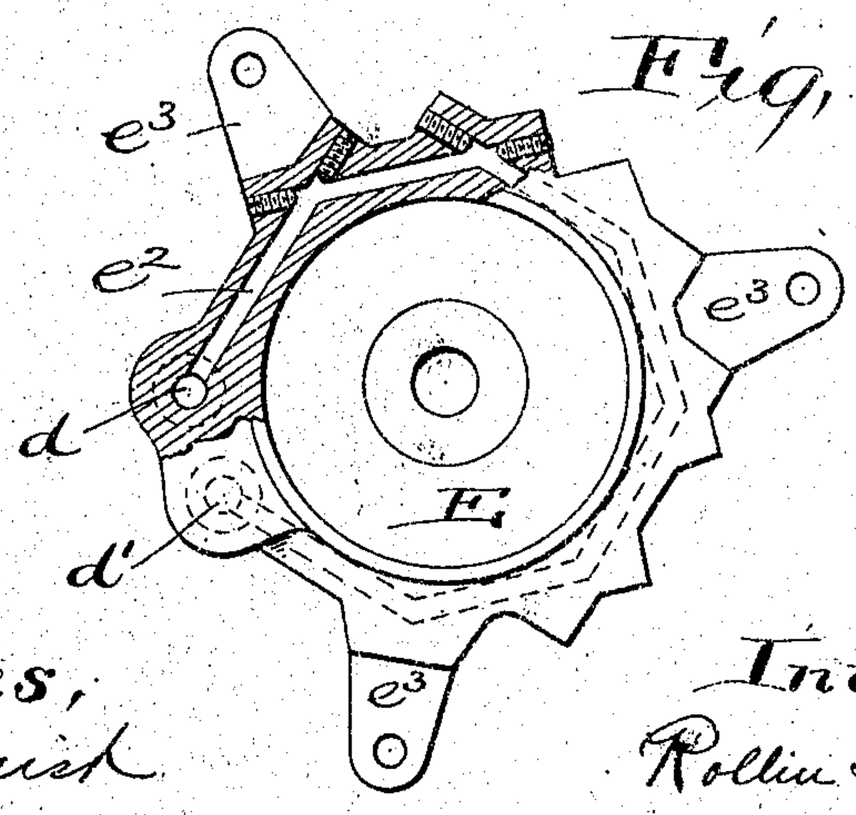


Fig. 5,



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UNITED STATES PATENT OFFICE.

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GASOLENE BURNER.

No. 806,308. Specification of Letters Patent. Patented Dec. 5, 1905.

Application filed December 3, 1900. Serial No. 38,408.

To all whom it may concern:

Be it known that I, ROLLIN H. WHITE, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Gasolene-Burners, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

The invention relates to a gasolene-burner adapted for use on steam-automobiles and in other places where it is exposed to drafts of air and under conditions where it is desirable at intervals to diminish or extinguish the main-burner flame.

The invention consists in the construction and combination of parts hereinafter described, and pointed out definitely in the claims.

In the drawings, Figure 1 is a plan view of said burner. Fig. 2 is a side elevation thereof with certain parts shown in vertical section. Fig. 3 is a vertical section of the main burner. Fig. 4 is a central vertical section through the pilot-burner and its associated parts; and Fig. 5 is a plan view of the pilot-burner shell, partly broken away and sectioned to show the ports in the upper end thereof.

Referring to the parts by letters, A represents the main burner, which is a box-like structure consisting, preferably, of the top plate *a* and a bottom plate *a'*, having a vertical marginal wall a'^{0}, at the top of which is a horizontal flange a^{2}, on which the edge of the top plate rests and to which it is secured by any suitable means which make a gas-tight joint. The top plate *a* has a plurality of raised hollow ribs arranged, as shown, in concentric circles, and said ribs have each in their tops a plurality of narrow slits a^{4}, through which the combustible mixture escapes from the burner. In the top plate, between the ribs, are a large number of holes a^{5}, and vertically below these holes are other holes a^{6} in the bottom plate. The vertical draft-tubes a^{7} pass through the burner and through said holes in the top and bottom plates, and they are secured in place by having their ends upset, as shown. These tubes assist in holding the top and bottom plates of the burner in proper relation; but their main function is to serve as draft-tubes through which will flow an adequate quantity of air to effect the complete combustion of the gas issuing from the slits a^{4}.

Connected with the side of the burner is an inlet-tube F of common form, into which the gas is injected, whereby air is also drawn into said tube to mix with said gas and form a combustible mixture.

The main supply-pipe B contains a valve *b*, which may be opened or closed to permit or prevent the flow of gasolene toward the burner. Just beyond this valve the supply-pipe is branched, one branch C going to the main burner and the other branch D going to the pilot-burner E. The branch pipe C passes up through one of the draft-tubes a^{7} and extends over the top of the main burner, preferably in the form of a loop *c*, to expose a large amount of surface to the heat of said burner. Beyond this loop the pipe C is extended in a coil c^{5} over the pilot-burner E, whereby this coil will be heated by the pilot-burner. The heating of the pipe by the main burner or the pilot-burner, or both, generates the gas by vaporizing the gasolene in the said pipe. This pipe C is then extended to the inlet-tube F and terminates in a valve-controlled nozzle c^{4}, which directs the gas into said tube.

The pilot-burner E is located in such position that its flame will light the main burner when gas is allowed to enter the same and to escape through the slits a^{4}. As shown, it occupies a position in a vertical tube H, which passes through the main burner, thereby making it necessary that some (in the present case two) of the raised ribs a^{3} shall not be complete circles. This tube H extends below the pilot-burner shell, and at its lower end it has an internal drip-cup *h*, formed, as shown, by turning the lower edge of said tube inward and upward, whereby said drip-cup is in the form of an annular gutter.

The pilot-burner consists of a tubular shell *e*, open at its lower end and considerably enlarged at its upper end, from which project the arms e^{3}, which rest upon and are secured to the top plate of the main burner, whereby this pilot-burner is supported. This upper end is closed by a concavo-convex perforated cap-plate *e'*. The wall of the shell extends above the cap-plate and is thick enough to permit the port e^{2} to be formed therein. This port nearly encircles the pilot-burner shell. Its inlet end is connected with the upper end

of a vertical pipe d, which extends from the branch pipe D up through the tube H. The outlet end of this port is connected with a pipe d', which extends down in the tube H and has at its lower end a valve-controlled discharge-nozzle d^2, which is pointed into the lower edge of the pilot-burner shell. The cap-plate e' of this pilot-burner has its convex side uppermost, and a concavo-convex disk G, made of some refractory material, as porcelain or platinum, is secured to said cap with its convex side down. This plate G is preferably perforated, as shown.

A valve-controlled branch pipe d^3, which is connected with the branch pipe D, is passed through the wall of the tube H above the drip-cup, and its end is turned down, so as to discharge into said drip-cup.

The branch pipe D consists in part of a pipe-section d^5, which is filled with gravel, and the ends of this pipe are partly closed by perforated screw-plugs d^6. The purpose of the gravel is to prevent any impurities in the gasolene from passing through it. This pipe-section d^5 is screwed into other sections of the pipe at its ends, whereby it may be easily removed and cleansed. In the pipe C is another section c^5, which contains gravel and is constructed and connected up substantially as described with respect to the pipe-section d^5.

To set this burner in operation, the valve in the pipe d^4 is opened to permit a sufficient quantity of gasolene to flow into the drip-cup h, after which said valve is closed. The gasolene in this drip-cup is lighted, and obviously the flame is very greatly protected, because it is inside of the tube H. It will not be blown out by air-currents which would extinguish it if the drip-cup was not thus protected. The heat generated by the burning of this gasolene in the drip-cup heats the vertical tubes d d' and also the pilot-burner shell, especially the upper part thereof containing the port e^2, which part overhangs said drip-cup. When the parts described are sufficiently heated, the gasolene in them is vaporized. Then the valve in the nozzle d^2 is opened, and the gas is ejected into the pilot-burner, which is lighted above the cap e'. The heat of the gasolene burning above the cap keeps the surrounding walls which contain the port e^2 heated, so that gasolene passing through it will be vaporized. The heat of this burner-flame also heats the coil e^4 above it, whereby the gasolene in this coil is vaporized. The valve of the nozzle e^4 is then opened, and gas is injected into the inlet-pipe B. When the combustible mixture of gas and air begins to escape from the slits a^4, it is lighted by the flame of the lighted pilot-burner E. The main-burner flame thereafter heats the loop e above it, whereby said loop will become sufficiently hot to vaporize the gasolene passing through it. Sometimes sudden gusts of air will blow out the flame both of the main burner and the pilot-burner. With the construction shown, however, these flames will be automatically relighted, if the gust of air is of short duration, by the disk G, which is kept heated to incandescence by the pilot-burner flame and will consequently relight said burner. This pilot-burner flame will, as above described, relight the main burner.

The described burner is especially adapted for use to heat the boilers of steam-automobiles. It is also adapted for use on steam-launches and in many other situations in which it is exposed to sudden gusts of air or where it is desirable to diminish or extinguish the main-burner flame.

The burner is especially contrived for burning gasolene—that is to say, for vaporizing the gasolene and burning the resulting gas. Certain features of the invention are, however, equally useful in case any form of combustible gas generated at a distance from the burner is used, and the entire burner, as shown, is capable of using such gas. It is obvious also that in many respects the particular mechanical construction shown may be greatly modified without departing from the invention as set forth in the claims.

Having described my invention, I claim—

1. The combination of a main burner, a pilot-burner tube which passes vertically through the same and is open at both ends and has on its lower end an internal drip-cup, a pilot-burner in said tube, which burner contains near its upper end a port which partly surrounds the burner, a discharge-pipe connected with one end of said port and which discharges into the inlet of the pilot-burner, and a supply-pipe having one branch which is connected with said port, a second branch adapted to discharge into said drip-cup, and a third branch which is coiled over the pilot-burner and discharges into the inlet of the main burner, and three valves for severally controlling the flow of the fuel through the said three branches substantially as and for the purpose specified.

2. The combination of a main burner, a pilot-burner tube, which passes through the same and is open at both ends, an annular drip-cup within said tube, a pilot-burner within said tube, having an inclosed port, near its upper end and partially encircling the same, a supply-tube leading to said port, a discharge-pipe leading therefrom to the lower end of said pilot-burner, and means for controlling the discharge through said last-mentioned pipe, substantially as described.

3. In an apparatus for burning hydrocarbon, the combination of a primary burner and secondary burner provided with separate mixing-chambers and having a common combustion-chamber, a secondary-burner fuel-supply system comprising a vaporizing-coil and a superheating-coil formed as a continuous pipe and subjected respectively to the flame of said sec-

ondary and said primary burner, connections providing communication between said vaporizing-coil and a source of oil-supply and between said superheating-coil and the mixing-chamber of said secondary burner, a primary-burner fuel-supply system comprising an individual vaporizer, means for feeding oil thereto, means whereby vapor therefrom is given an admixture of air and discharged into the mixing-chamber of said primary burner, and a fire-pan arranged to produce an initial supply of vapor to said primary burner.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

ROLLIN H. WHITE.

Witnesses:
E. B. GILCHRIST,
E. L. THURSTON.