

No. 684,836.

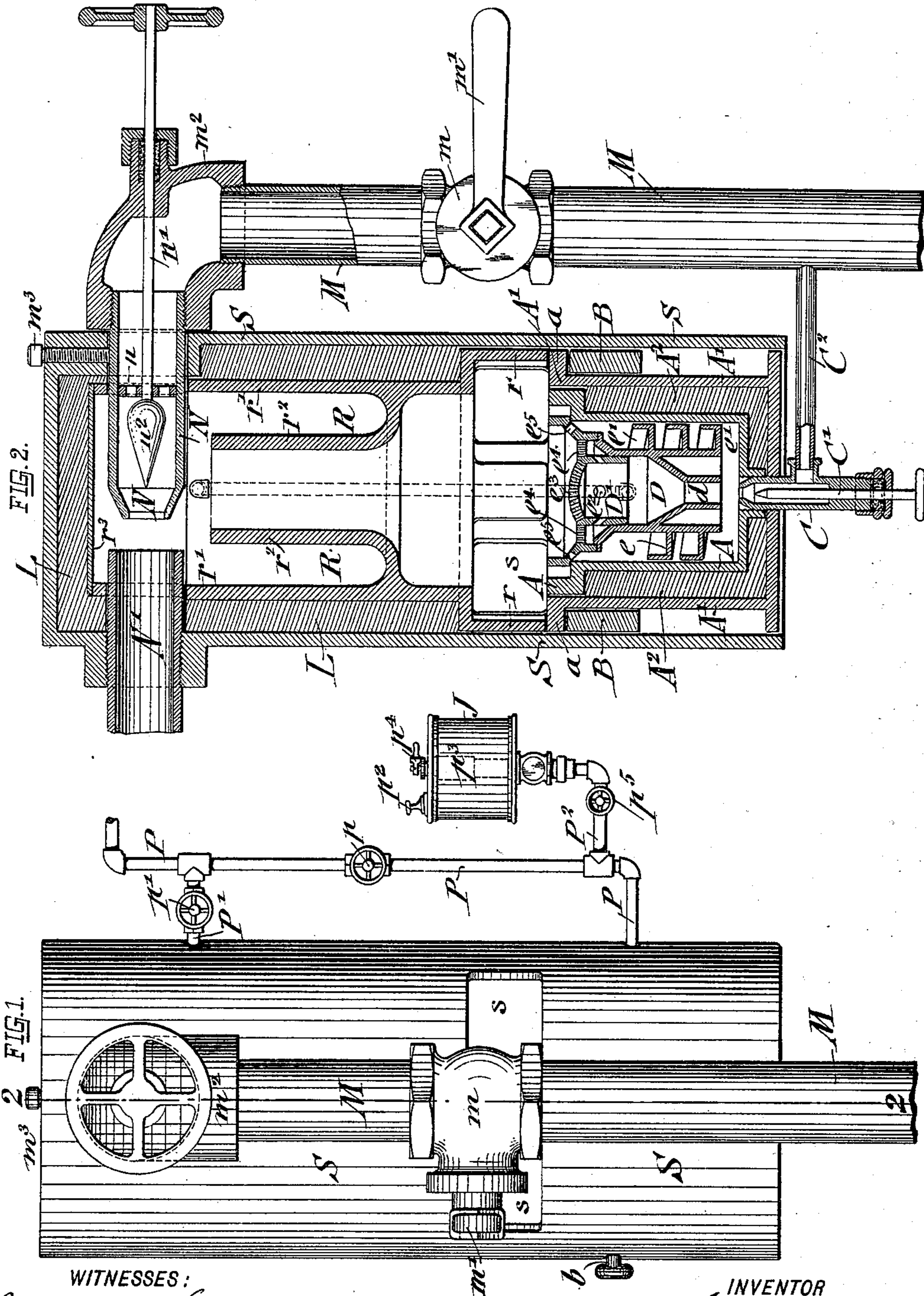
Patented Oct. 22, 1901.

G. MACHLET, JR.
CARBURETER.

(Application filed Feb. 8, 1901.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:

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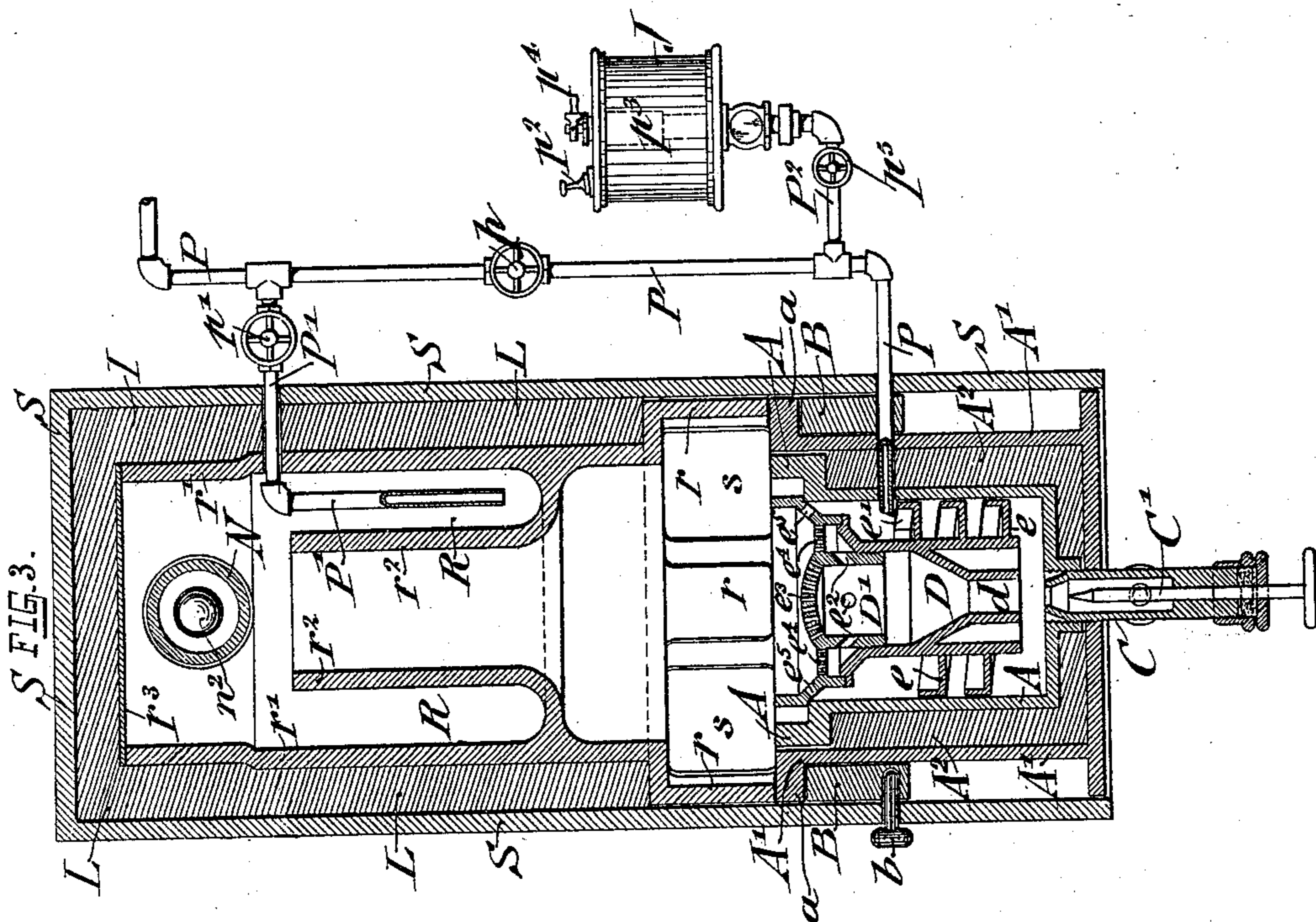
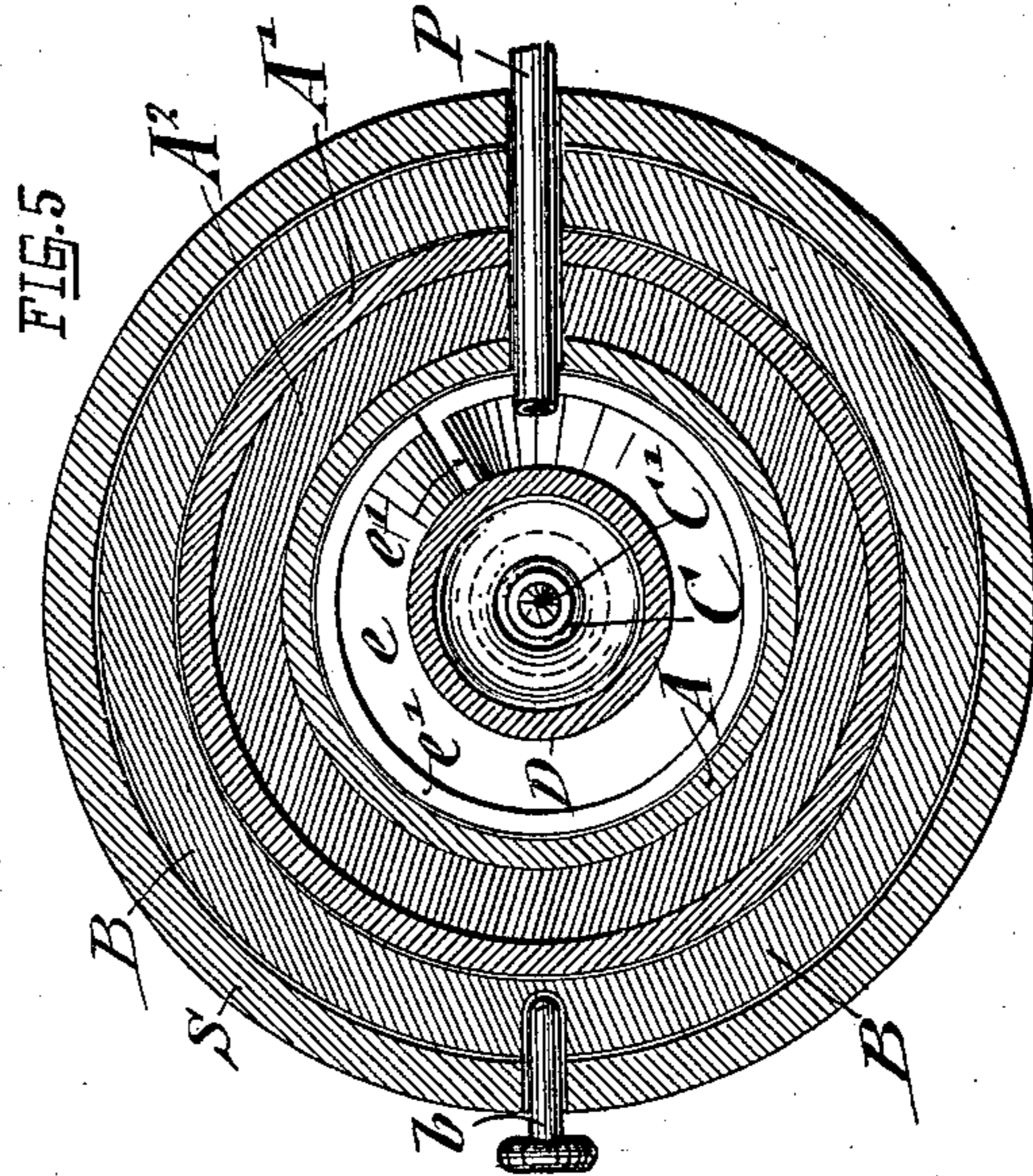
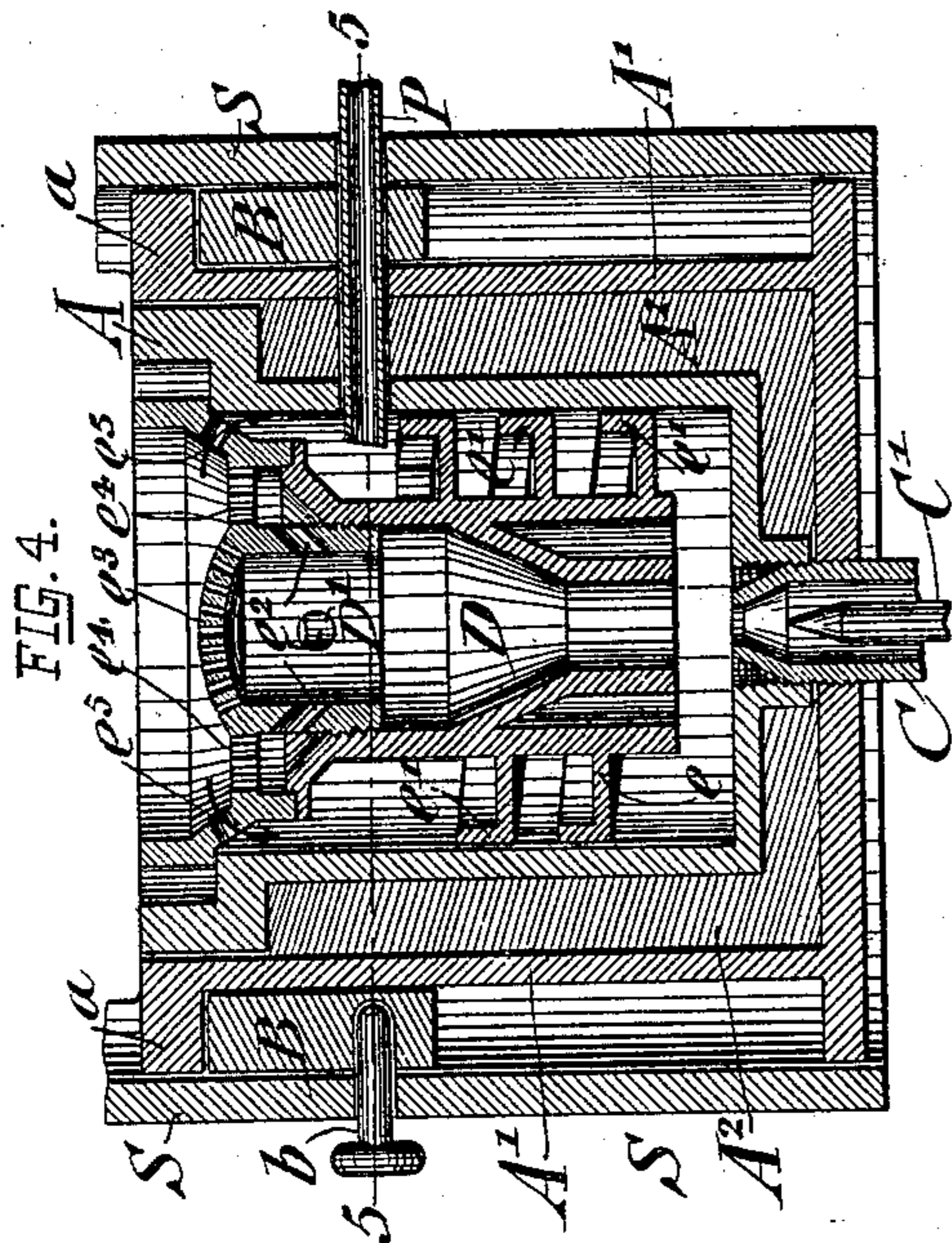
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UNITED STATES PATENT OFFICE.

GEORGE MACHLET, JR., OF ELIZABETH, NEW JERSEY.

CARBURETER.

SPECIFICATION forming part of Letters Patent No. 684,836, dated October 22, 1901.

Application filed February 8, 1901. Serial No. 46,507. (No model.)

To all whom it may concern:

Be it known that I, GEORGE MACHLET, Jr., a citizen of the United States, residing at Elizabeth, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Carbureters, of which the following is a specification.

This invention relates to an improved carbureter of that class which is designed for the generation of heating-gas from petroleum and other liquid hydrocarbons, said carbureter producing the gas by mixing the petroleum vaporized by the heat of the burner with a suitable quantity of air mixed with the vapors by an injector, so that a continuous and reliable flow of gas for use in gas-furnaces and other appliances is obtained; and the invention consists of a carbureter which comprises a retort for the vaporizing of the petroleum or other liquid hydrocarbon, an injector arranged above said retort for supplying air under pressure and mixing it with the vapors generated in the retort, and a burner located below the retort for vaporizing the hydrocarbon supplied thereto.

The invention consists, further, of means for starting the burner by supplying a light hydrocarbon from an auxiliary reservoir preparatory to connecting the burner with the main supply of hydrocarbon oil; and the invention consists, lastly, of certain details of construction and combinations of parts, which will be fully described hereinafter and finally pointed out in the claims.

In the accompanying drawings, Figure 1 represents a side elevation of my improved carbureter for generating gas for heating purposes. Fig. 2 is a vertical central section of the same on line 2 2, Fig. 1. Fig. 3 is a vertical central section on a plane at right angles to the plane of Fig. 2. Fig. 4 is a vertical central section through the burner, drawn on a larger scale; and Fig. 5 is a horizontal section of the burner on line 5 5, Fig. 4.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, R represents an annular retort, which is preferably made of cast-iron or other suitable metal and closed at the lower and open at the upper end. The retort is supported on feet *r*, resting upon the flange *a* of the burner-jacket A', which

in turn rests on the supporting-ring B, held in position by a locking-pin *b* and the supply-pipe P for the hydrocarbon fed to the burner D D'. By this pin and pipe the entire retort R and burner are supported in the exterior shell S of the carbureter. Between the feet *r* of the retort R are formed openings *s* in the shell S, through which air required for the proper combustion of the gas emitted by the burner D D' is supplied. The outer wall *r'* of the annular retort is extended for some distance above the inner wall *r''* of the same and closed at its top by a plate *r'''*. Between the shell S and the retort R and plate *r'''* is interposed a lining of asbestos, fire-brick, or other refractory material. The petroleum or other hydrocarbon oil to be vaporized is supplied to the retort R by a main pipe P, which is connected with a suitable oil-tank that is located above the carbureter, so that the oil is supplied by gravity, or located below the level of the same, in which latter case the oil has to be raised by pressure, so as to be forced through the supply-pipe P. A branch pipe P' passes through the upper part of the casing and delivers into the retort, as shown in Fig. 3. The branch pipe P' is provided with a stop-cock *p'*, and the main supply-pipe P with a stop-cock *p*. A small cylindrical reservoir J is supported on a second branch pipe P², which connects also the main supply-pipe P, said reservoir being preferably made of a glass body with metallic heads. It is filled with naphtha or other easily-vaporizable hydrocarbon oil through an opening in its top, which is closed by a suitable plug *p*². The reservoir J is further provided at its center with a plug *p*³, provided with a handle *p*⁴, said plug resting by its inner end on the upper end of the branch pipe P² in the reservoir J, so as to close the supply of naphtha to the same when the plug is in position, but permit the supply of naphtha to the branch pipe and burner when the plug is removed. The branch pipe P² is provided with a stop-cock *p*⁵ below the reservoir J, so as to be opened whenever the machine is to be started for supplying naphtha to the burner and heating it preparatory to the regular supply of petroleum to the same.

The burner is shown in detail in Figs. 4 and 5. It is composed of a lower portion D and

an upper portion or head D', both located in a casing A, between which and the burner-jacket A' is interposed a lining A², of refractory material. The head is provided with a downwardly - extending central portion 5 screwed to the lower portion D and forming with that portion of the latter above its contracted throat *d* a mixing-chamber for the vapors of the hydrocarbon oil generated by 10 passage of the oil over the heated helical channel *e* at the outside of the lower portion D. The connected parts D D' are supported by the latter on a shoulder of the casing A, as seen in Figs. 2, 3, and 4.

15 For supplying the air necessary for the operation of the carbureter a main air-supply pipe M, connected with any suitable source of air under pressure, is provided with a valve *m*, controlled by a handle *m'*. The upper 20 end of the air-supply pipe M is connected by an elbow *m*² with an injector-tube N, that extends through the shell S and wall *r'* of the retort into the space above the same, which serves as a mixing-chamber for the air and 25 the vapors generated in the retort. Opposite and in line with said injector-tube a discharge-pipe N' passes through the opposite side of the shell S and wall *r'* for conducting off the carbureted-gas mixture for use. The 30 injector-tube N is secured in position by a set-screw *m*³ passing through the shell S, and is preferably provided with a screen-plate *n*, through which and a stuffing-box of the elbow *m*² passes the spindle *n'* of a needle-valve *n*², by which passage of air through the 35 tapering mouth of the tube N is perfectly controlled. At the opposite side of the valve *m* a branch tube C² conducts the air under pressure into the air-supply tube or nozzle C 40 of the burner, which is controlled by the needle-valve C' and delivers into the burner-casing at a point opposite the lower part D of the burner.

The operation of the carbureter is as follows: The valves *p* and *p'* being closed, the 45 valve *p*⁵ is opened and air admitted through tube C. The naphtha or other volatile hydrocarbon in the reservoir J flows upon lifting plug *p*³ through pipe P and out upon the 50 flanged channel *e* and along the same, its vapors rising through the openings *e*⁵ in the head D' and also sucked in downward direction, mixed with the air-blast, and the mixture forced through the openings in the 55 burner-head. Here they are ignited by the ignition of cotton-waste placed upon the head by inserting through an opening *s*. The products of combustion of the flame at the annular portion *e*⁴ of the head are sucked down 60 through the openings *e*⁵ and pass in a helical course over the vaporizing naphtha in the channel *e*, accelerating its evaporation and rapidly heating the burner, and are then in mixture with fresh naphtha-vapors and air 65 delivered by the blast through throat *d* into the mixing-chamber, whence the mixture passes out through the head and is burned.

When the burner has become sufficiently heated to vaporize the heavier hydrocarbon 70 when the same passes over the channel *e*, the supply of naphtha is shut off and the petroleum admitted through pipe P, the operation of the burner continuing in the same manner described. Petroleum is then admitted 75 by pipe P' to the retort R and is vaporized quickly therein, owing to the intense heat of the burner. The vapors, with the surplus gases of the combustion of the burner which rise through the open center of the retort, are 80 mixed with the air emitted through the injector-tube N, and the mixture is forced by the blast into the discharge-tube N' and conducted in the same to the place of use. The retort serves as means for conducting the 85 gases of combustion into the mixing-chamber above the retort.

My improved carbureter has the following advantages:

First. It can be readily started by supplying a quantity of easily-vaporizable hydrocarbon oil to the burner and its retort, the 90 heavier and less easily vaporized oil being supplied after the burner is heated up sufficiently to handle it.

Secondly. It utilizes the surplus gases of combustion from the burner by mixing them 95 with the vapors generated in the retort, whereby an economy of heat is effected, and conducting the mixture with air to the place of use in a highly-heated condition. 100

Thirdly. The entire carbureter is small and compact in shape, fully protected by the non-conducting linings against the outer air, and 105 can be operated without danger of fire or accident to the surroundings, as the flame cannot pass to the outside nor explosions occur.

Fourthly. The carbureter after being once started works automatically as long as required and supplies heating-gas of good 110 quality, which can be conducted to a considerable distance without condensation.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A carbureter, consisting of an exterior 115 shell, having a refractory lining, a vaporizing-retort therein, a burner below the retort, an air-injector delivering into the space above the retort, an air-supply pipe for the burner, pipes for supplying oil to the vaporizing-retort and the burner, means for conducting 120 the heated gases of combustion from the burner into the space above the retort, and a discharge-tube leading from said space above the retort, substantially as set forth. 125

2. A carbureter, consisting of an exterior shell, provided with a refractory lining, and with openings in its wall, a vaporizing-retort 130 within the shell above said openings, a burner below said retort, an air-injector delivering into the space above the retort, an air-supply pipe for the burner, pipes for supplying oil to the vaporizing-retort and the burner, said vaporizing-retort being of annular shape, and lo-

5 cated to conduct the heated gases of combustion from the burner into the space above the retort, and a discharge-tube leading from said space above the retort, substantially as set forth.

10 3. A carbureter, consisting of an exterior shell having a refractory lining and openings in its wall, an annular vaporizing-retort within the shell, above said openings, a burner
15 in said shell below the openings, an air-injector delivering into the space above the retort, a discharge-tube arranged in line with said air-injector, an air-supply pipe for the burner, and pipes for supplying oil to the vaporizing-retort and burner, substantially as set forth.

4. A carbureter, consisting of an exterior shell having a refractory lining and openings

in its wall, an annular vaporizing-retort within the shell, above said openings, an air- 20 injector delivering into the space above the retort, a discharge-tube arranged in line with said air-injector, an air-supply pipe for the burner, a valved oil-supply pipe delivering into the burner and retort, an auxiliary oil- 25 reservoir, and a valved branch pipe connecting said oil-supply pipe and reservoir, for supplying oil from the reservoir to the burner, substantially as set forth.

In testimony that I claim the foregoing as 30 my invention I have signed my name in presence of two subscribing witnesses.

GEORGE MACHLET, JR.

Witnesses:

PAUL GOEPEL,
JOSEPH H. NILES.