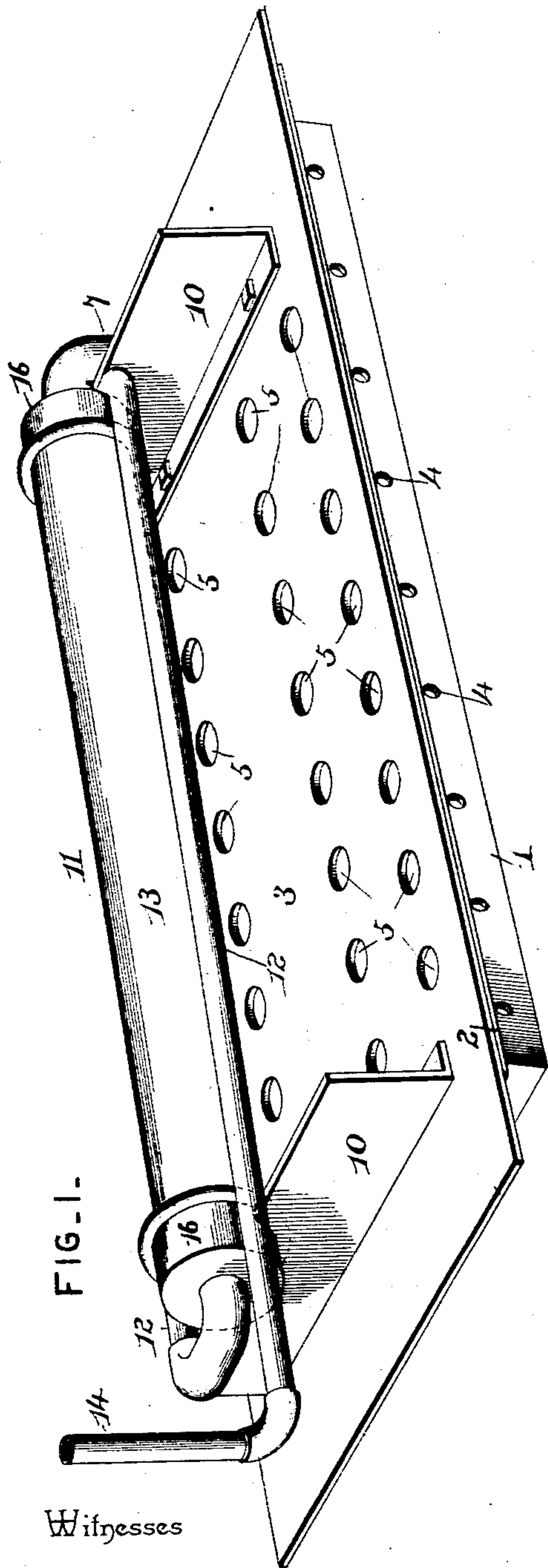


(No Model.)

W. E. VERNON.  
FLUID FUEL BURNER.

No. 525,569.

Patented Sept. 4, 1894.



Witnesses

*Jas. K. McLaughlin*

*[Signature]*

FIG. 3-

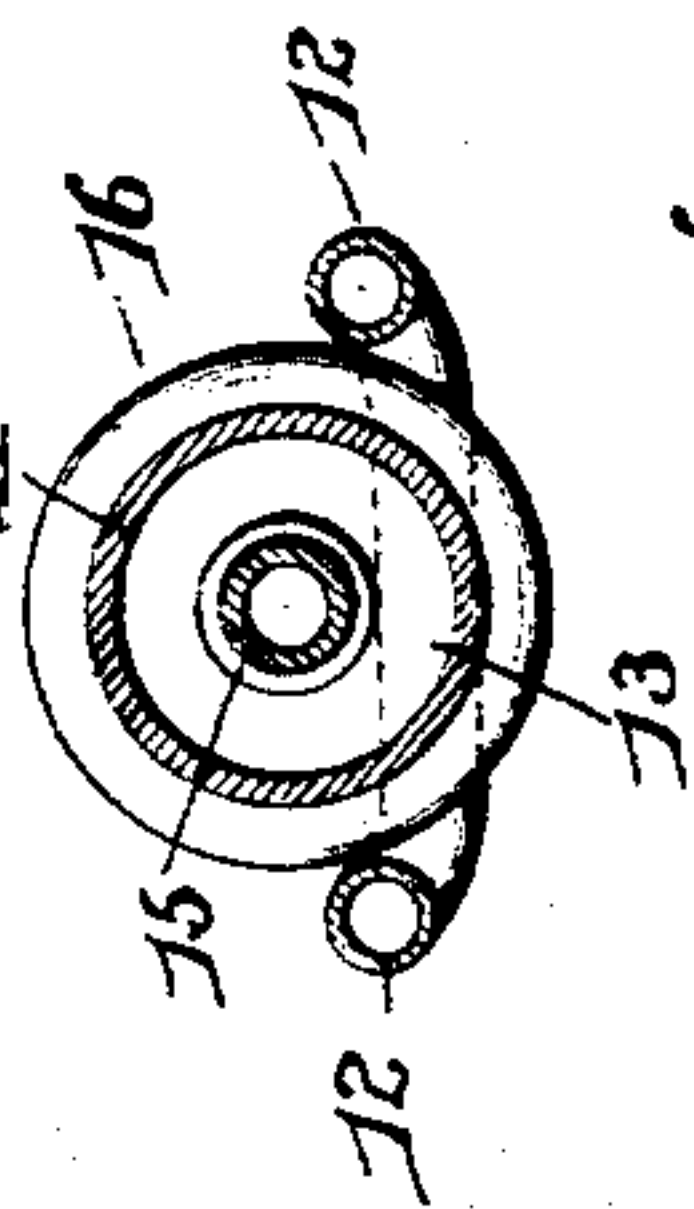
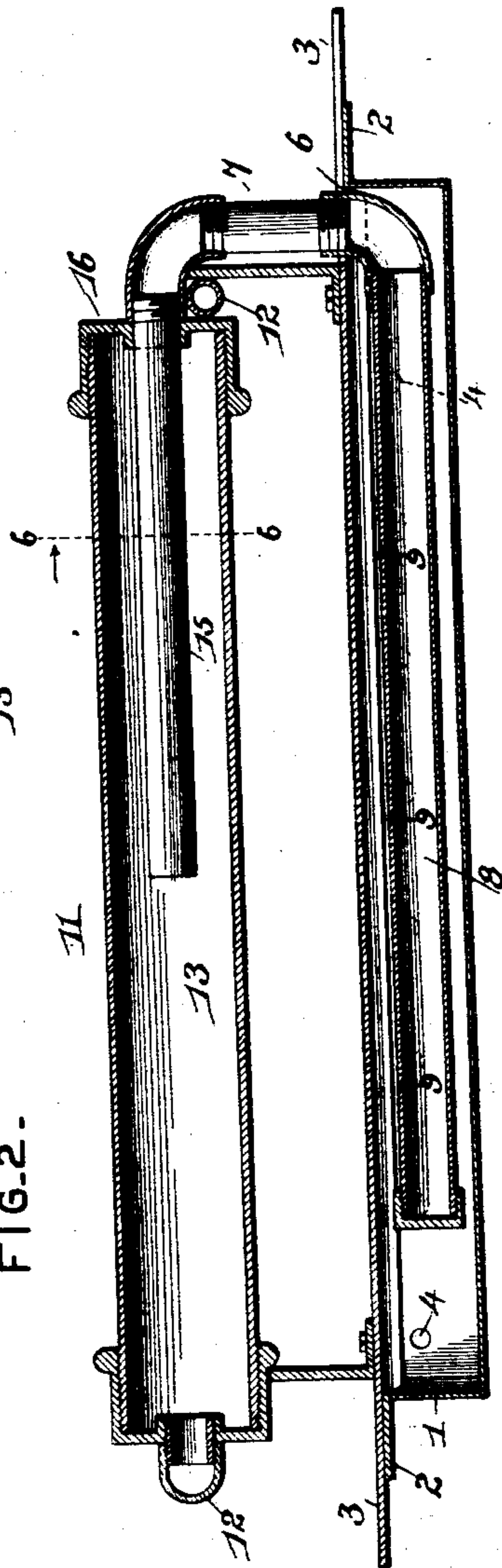


FIG. 2.



Inventor

*William E. Vernon*

By *his* Attorneys,

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# UNITED STATES PATENT OFFICE.

WILLIAM ELIAS VERNON, OF OSKALOOSA, IOWA.

## FLUID-FUEL BURNER.

SPECIFICATION forming part of Letters Patent No. 525,569, dated September 4, 1894.

Application filed February 15, 1894. Serial No. 500,293. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM ELIAS VERNON, a citizen of the United States, residing at Oskaloosa, in the county of Mahaska and State of Iowa, have invented a new and useful Fluid-Fuel Burner, of which the following is a specification.

The invention relates to fluid fuel burners, and has for its object to provide a simple, inexpensive and efficient apparatus to secure a perfect combustion of the fuel; to provide means whereby a cushion of vapor is formed between the point of supply and the point of ignition, to avoid the extinguishment of the flame when the supply of fuel is suddenly increased or is increased beyond that which is necessary; and to provide an arrangement of parts whereby a free expansion of the fuel, when vaporized, is secured without producing "back pressure" in the supply pipe.

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

In the drawings: Figure 1 is a perspective view of a fluid fuel burner embodying my invention. Fig. 2 is a central longitudinal section of the same. Fig. 3 is a section on line 6—6 of Fig. 2.

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

In the form of my invention which I have illustrated in Figs. 1 and 2, the initial ignition or oil-pan, 1, is provided at its upper edge with the horizontal flange or rim, 2, which supports the cap-plate, 3, and is further provided, in its sides, with the air-inlet perforations, 4. The cap-plate 3, is provided in each side of its longitudinal center with a series of openings 5, and at its end with an opening 6, through which descends a connecting pipe 7, bearing and communicating with the burner-tube 8; said burner-tube being provided with burner openings 9, and being arranged longitudinally in the pan 1, beneath an imperforate portion of the cap-plate between the series of vents or openings 5 therein.

Supported upon the brackets 10, carried by the cap-plate, is the generator 11, which com-

prises the small-bored conductor 12, and the communicating, enlarged retort or receiver 13. The conductor 12, is connected to the fuel supply pipe 14, extends parallel with and adjacent to one side of the retort or receiver 13, the latter then around the end of the retort or receiver and returns parallel with and adjacent to the opposite side of the same, and is connected to one end thereof. The connecting pipe 7, communicates with the opposite end of the receiver from that to which the conductor is attached; the connection between the pipe 7 and the receiver being formed by means of a tube 15, arranged axially in the receiver, and extending to a point adjacent to the center of the length thereof. This tube 15 may be formed, as shown in the drawings, as an extension of the connecting-pipe 7, being threaded in the opening in the center of the cap 16 which forms the end of the receiver; but this arrangement is susceptible of variation. The essential feature of this part of the construction consists in the arrangement in the receiver, at the outlet end thereof, of an eduction tube of less diameter than the receiver, its inner end being disposed at or near the center of the receiver and its outer end being in communication with the burner, (such communication being in this case through the interposed connecting-pipe 7.)

The advantage derived from the use of a receiver of larger bore than the conductor and connecting-pipe resides in the fact that the body of vapor which accumulates therein during operation forms a cushion, whereby when the supply of fuel is increased beyond that which is necessary, or is increased suddenly by accident or otherwise, the pressure caused by such increase of supply is deadened or softened by said cushion and does not affect the combustion at the burner. I have found that when the generator is constructed of pipes of uniform diameter or section, an increase of pressure caused by an increase of supply, produces an extinguishment of the flame at the burner, owing to the fact that the increased pressure is conveyed without loss to the burner-tube; and it is to overcome this disadvantage that I employ the intermediate enlarged receiver.



It will be observed that the small-bored conductor, which extends around the receiver, in the same horizontal plane therewith, is disposed adjacent to the sides thereof, whereby the flame from the burner, ascending through the vents or openings in the cap-plate, come in contact with and envelop both receiver and conductor. The effect of this is that the fuel is vaporized while passing through the conductor and enters the receiver in the form of gas; thus allowing a necessary expansion approximately at the point of vaporization.

It is well known in this art that crude oil contains solid and heavy matter which is not always entirely consumed during the process of vaporization, and that particles of this solid matter are liable to accumulate in the outlets, especially of the burner-tube, and eventually interfere with the proper operation of the apparatus; and it is to prevent this accumulation in the burner-tube that I employ the axially disposed eduction tube in the outlet end of the receiver. The said solid particles fall to the bottom of the receiver and are prevented by the position of the eduction-tube from escaping, and thus are exposed to the intense heat of the under side of the receiver. Thus, the solid matter is burned until sufficiently fine and light to escape through the eduction-tube and pass to the burner without causing the clogging of the perforations therein. It will be seen that the pressure of vapor in the receiver cannot force particles from the bottom thereof into the eduction-tube.

The advantage of the above described arrangement of the perforations 5 in the cap-plate upon opposite sides of its longitudinal center, whereby there is a central imperforate portion directly over and parallel with the burner-tube and longitudinally under the receiver 13, is that the flame as it rises from the burner strikes this imperforate portion and is spread before passing through the plate. This spreading of the flame brings it more intimately in contact with the air supplied through the side or air-inlet perforations 4, thus producing more perfect combustion; and after the flame passes through the perforations 5 it rises and envelops both the receiver 13 and the conductor 12, and the open space between the portions of flame which rise through the opposite series of perforations allows air to reach the center of the

column and thus maintain an intense heat which is desirable in devices of this class.

It will be understood that the axial arrangement of the eduction-tube 15 in the retort or receiver provides for compactness of construction and arranges said eduction tube in the line of flow of the fuel or vapor, and hence impurities which are carried by the fuel upon falling to the bottom or lower side of the retort or receiver are advanced until they have passed the front or inlet end of said eduction-tube, thus preventing the obstructing of said inlet.

Having thus described my invention, I claim—

1. In a fluid fuel burner, the combination of the burner and a receiver with the initial ignition or oil pan, having openings 4, and provided with a cap plate 3 having perforations 5 upon opposite sides of its longitudinal center, so as to have its central imperforate portion directly over and parallel with the burner tube and longitudinally under the receiver 13, whereby the flame strikes this imperforate portion and is spread before passing through the perforations 5, so as to bring it more intimately in contact with the air supply through the side perforations 4, substantially as described.

2. In a fluid fuel burner, the oil pan provided with openings 4 and having the cap 3 provided with perforations 5 upon each side of its center, so as to leave an imperforate portion of the cap plate directly under the receiver, combined with the burner tube placed under the imperforate portion of the cap plate, the connecting pipe 7, the receiver 13 supported upon the flanges 10 upon the cap plate, the tube 15 connected with the pipe 7 and extending inwardly into the receiver, the conductor pipe 12 extending longitudinally around the receiver 12, and connected with its opposite end from the tube 15, and the supply pipe 14 connected with the outer end of the conductor 12, the parts being arranged and constructed to operate, substantially as shown.

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

WILLIAM ELIAS VERNON.

Witnesses:

DAVID RAMSEY PETTIT,  
HENRY CLINTON PARKHURST.