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No. 771,189.

PATENTED SEPT. 27, 1904.

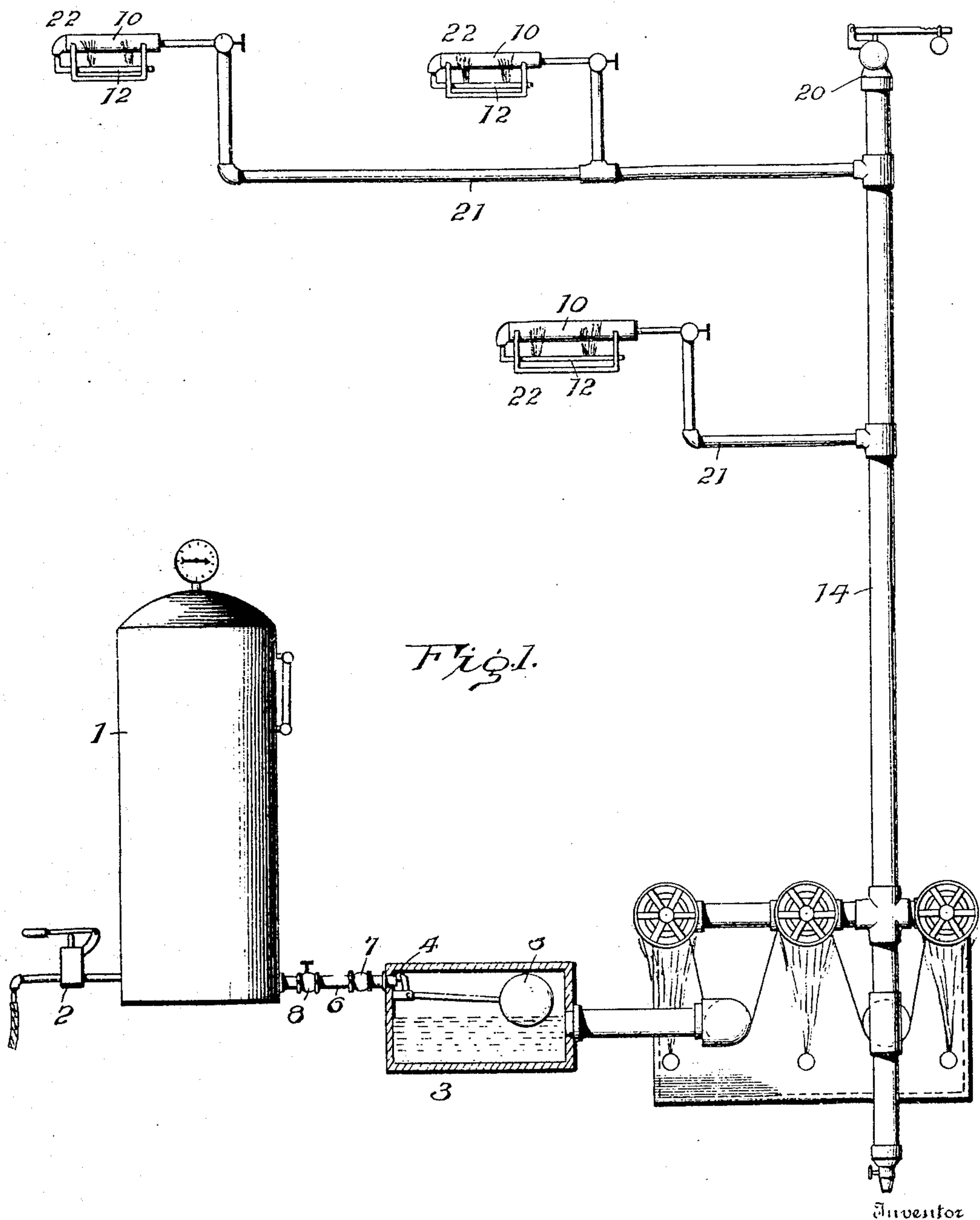
J. A. TOOMEY.

FUEL OIL BURNER.

APPLICATION FILED DEC. 2, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



Inventor

J. A. Toomey.

Witnesses

W. N. Woodson

By

R. A. B. Racy, Attorneys

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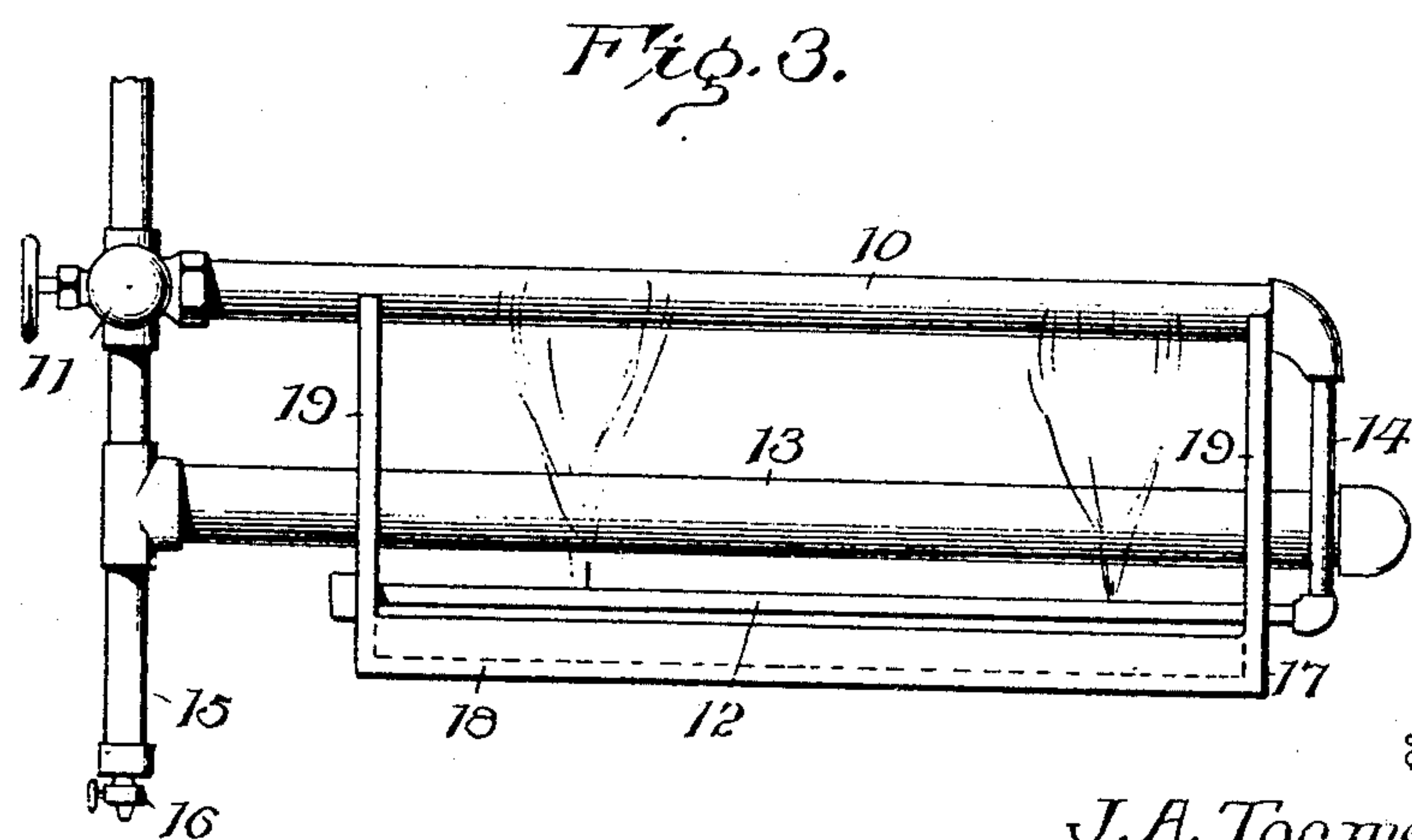
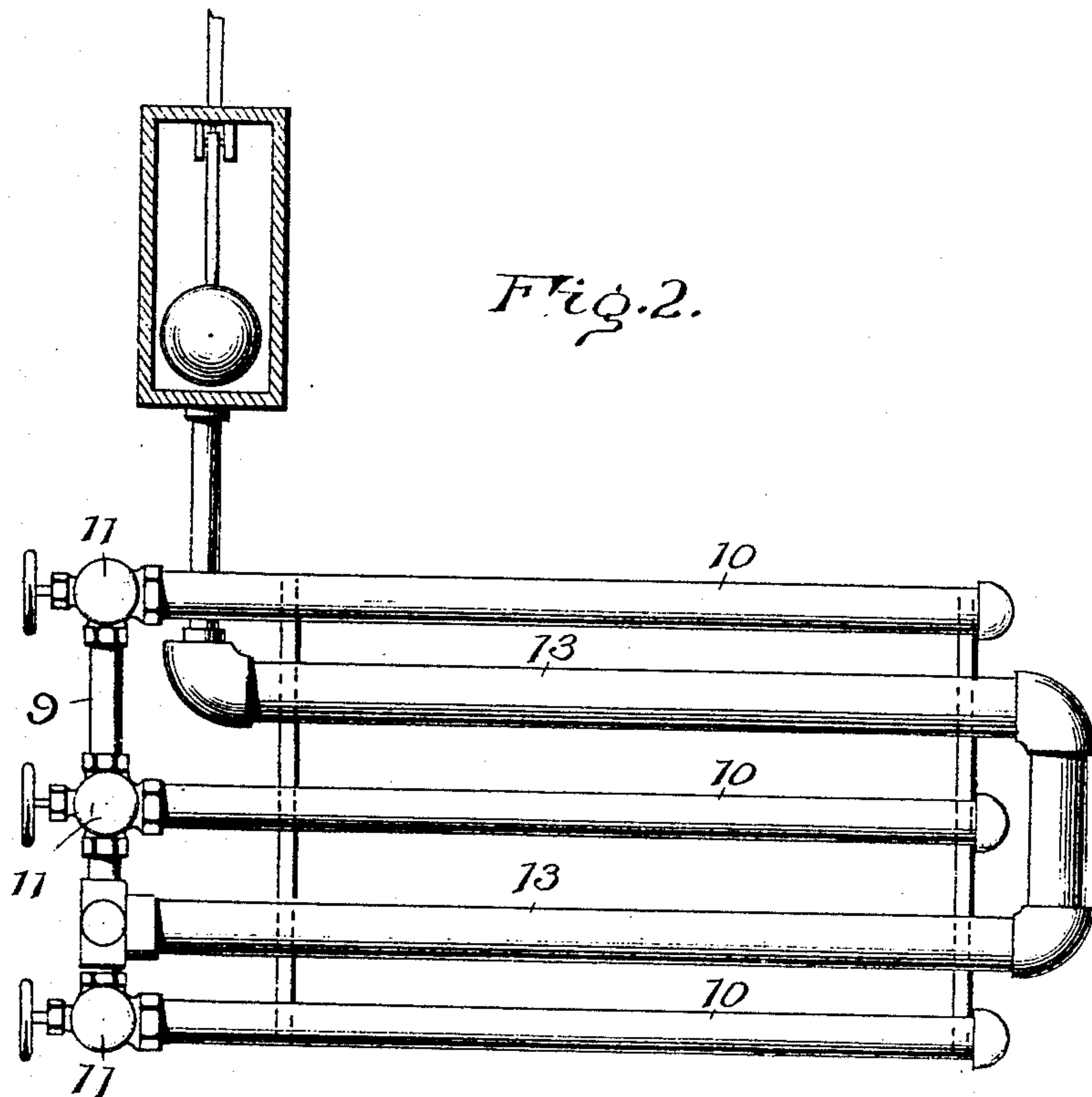
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

JOHN A. TOOMEY, OF TOLEDO, OHIO.

FUEL-OIL BURNER.

SPECIFICATION forming part of Letters Patent No. 771,189, dated September 27, 1904.

Application filed December 2, 1903. Serial No. 183,489. (No model.)

To all whom it may concern:

Be it known that I, JOHN A. TOOMEY, a citizen of the United States, residing at Toledo, in the county of Lucas and State of Ohio, have
5 invented certain new and useful Improvements in Fuel-Oil Burners, of which the following is a specification.

The primal purpose of this invention is the provision of novel means for utilizing crude
10 oils and like hydrocarbons as fuel for illuminating and heating purposes.

An essential feature of the invention is to utilize the lighter volatile portions of the oil and to convert the same into gaseous vapor,
15 the heavier portion being drawn off and subsequently used in the industrial arts for lubricating, distillation, or other purpose.

The system embodies a regulator for automatically controlling the amount of oil fed to
20 the generator for conversion into gaseous vapor, which is subsequently utilized either for heating or illuminating.

The invention further consists of the novel features, structural details, and combinations
25 of parts, which hereinafter will be more particularly set forth, illustrated, and outlined in the subjoined claims.

In the drawings hereto attached and forming a part of this specification, Figure 1 is a
30 diagrammatic view of the invention. Fig. 2 is a top plan view of the burner and generator, showing the regulator, the tank of which is in section. Fig. 3 is a side elevation of the burner and generator illustrated in Fig. 2.

35 Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The storage-tank for containing the oil or
40 hydrocarbon in bulk is indicated at 1 and may be of any capacity and is provided with a pressure-indicator and sight-gage. The producing agent is supplied to the tank 1 in any manner and, as indicated, a pump 2 is pro-
45 vided and has connection with the source of supply by means of a flexible tube or other connection.

The regulator for controlling the feed of the oil or gas producing agent to the burner com-
50 prises tank 3 and float-controlled valve 4,

which is actuated by means of the float 5, caused to rise and fall by the change of level of the oil in the tank. The pipe 6 connecting the tanks 1 and 3 is provided with a check-
valve 7 and globe-valve 8, both of ordinary
55 construction, the latter being operated by hand to cut off the supply of oil for regulating the flow of the same as may be desired. The check-valve 7 prevents back pressure
60 from the tank 3 into the tank 1 and admits of the oil flowing freely into the tank 3 from the tank 1 when the valve 4 is open.

The generating-burner is preferably of sectional construction to admit of varying the capacity according to the number of burners
65 of the system in operation at one time, each section being provided with a valve to admit of one or more of the sections being cut out. This burner comprises the header 9, a series
70 of pipes 10 projected therefrom in parallel relation, valves 11 at the juncture of each of the pipes 10 with the header 9, burner-tubes
12 connected with the pipes 10 and arranged immediately below the same, and the gener-
75 ator 13 connected with the header 9 and having portions located intermediate of the burner-sections and in a plane between the planes of the pipes 10 and burner-tubes 12. Each burner-tube 12 is connected with the
80 corresponding pipe 10 immediately above by means of the vertical branch 14 and is of considerably less diameter than the pipe 10 and is provided upon its upper side at intervals
85 in its length with orifices for the escape of the gas to be burned. The pipes 10 constitute superheaters and are arranged in the flame of the respective burner-tubes for expanding and rarefying the gas preliminary to consumption thereof, whereby a more perfect
90 combustion is obtained.

The generator 13 is composed of connected pipes, each of which is arranged intermediate of the burner-sections and in a plane above the burner-tubes 12 to admit of the heat from the flame striking the top side of the pipes,
95 whereby the lighter portions of the oil are vaporized and pass off from the generator into the header 9, thence through the superheater 10 into the burner-tubes and the distributing-pipe 14, which latter is connected with the
100

header 9. The regulator and generator have a determinate relation, as indicated most clearly in Fig. 1, the arrangement being such that the level of the oil in the generator is near the top thereof and corresponds with the level of the oil in the tank 3, the space in the upper portion of the generator-pipes being essential to provide for the evaporation of the gas-producing agent. When crude petroleum is utilized, separation thereof is effected in the generator, the lighter portions being converted into gaseous vapor and the heavier portions settling in the lower portion of the generator, to be subsequently drawn off through the drain-pipe 15 and cock 16, the pipe 15 constituting a trap into which the heavy residue settles. In constructing the generating-burner care must be exercised to arrange the generator-pipes in such a position with reference to the burner-tubes that the heavier portion of the oil will not be carbonized.

The generating-burner comprises the frame 17, the lower portion of which is inclosed to form a pan 18 for catching drippings and holding a quantity of oil for starting the burner. The end pieces or uprights 19 of the frame are notched in their upper edges to form seats for receiving the pipes or superheaters 10 and the members of the generator 13 and are formed with openings through which pass the burner-tubes 12. This frame may be of any substantial construction.

The distributing-pipe 14 is provided with a safety-valve 20 for automatically relieving dangerous pressure, and branch pipes 21 connect with the distributing-pipe for conveying the gas therefrom to the required point of use.

The burners 22 located at the points for utilizing the gas are similar in construction to the generating-burner, the only difference being that the generator is omitted, the gas passing through the superheater 10 prior to its consumption at the orifices of the burner-tubes 12.

While the system is adapted most particularly for crude oil, nevertheless any refined petroleum or hydrocarbon, such as commonly employed as liquid fuel, may be utilized.

The gas-producing agent passes from the tank 1 into the tank 3, thence into the generator and burner-sections, a small portion being allowed to escape from the openings of the burner-tubes into the pan 18, which is ignited and permitted to burn so as to heat the parts for starting. After the pipes 10 and 13 have been sufficiently heated the hydrocarbon is vaporized and is burned at the orifices

of the burner-tubes, the flames playing upon the pipes 10, and the members of the generator being within the heating zone of said flame the burner continues to produce the gaseous vapor so long as the tank 1 contains a supply and the parts are in working condition. The vapor produced in the generator passes into the header 9, thence into the distributing-pipe 14 and pipes 10 of the burner-sections. When the full capacity of the system is required, all of the burner-sections are in operation; but when one or more of the burners only are in operation and the full capacity of the generating-burner is not required one or more of the sections may be shut down by closing the valve 11. When the system is not in operation, the valve 8 is closed, thereby shutting off the supply to the generating-burner. The heavy residue is drawn off at intervals from the generator and trap 15 by opening the cock 16. As the oil is vaporized in the generator the level recedes and the level of the oil in the tank 3 correspondingly lowers, thereby permitting the float 5 to descend and open the valve 4 to admit oil from the tank 1 into the tank 3.

Having thus described the invention, what is claimed as new is—

1. In a hydrocarbon-burner, the combination of horizontally-disposed superheating-pipes, burners parallel with and arranged below the superheating-pipes and connected therewith, a generator paralleling the superheating-pipes and burners and arranged between them vertically and horizontally, a pipe connecting the superheating-pipes and generator, and a valved trap connected with said pipe, substantially as set forth.

2. In a hydrocarbon-burner, the combination of a series of horizontally-disposed superheating-pipes, corresponding burners arranged below the superheating-pipes and connected therewith, generators paralleling the superheating-pipes and burners and arranged between them both vertically and horizontally, a valved pipe connecting the superheating-pipes and burners, a trap connected with said pipe, and means for automatically supplying hydrocarbon to the aforesaid valved pipe in regulable quantity, substantially as specified.

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

JOHN A. TOOMEY. [L. s.]

Witnesses:

BURTON SOUTHARD,
W. E. DITTENHAVER.