No. 750,106. PATENTED JAN. 19, 1904.

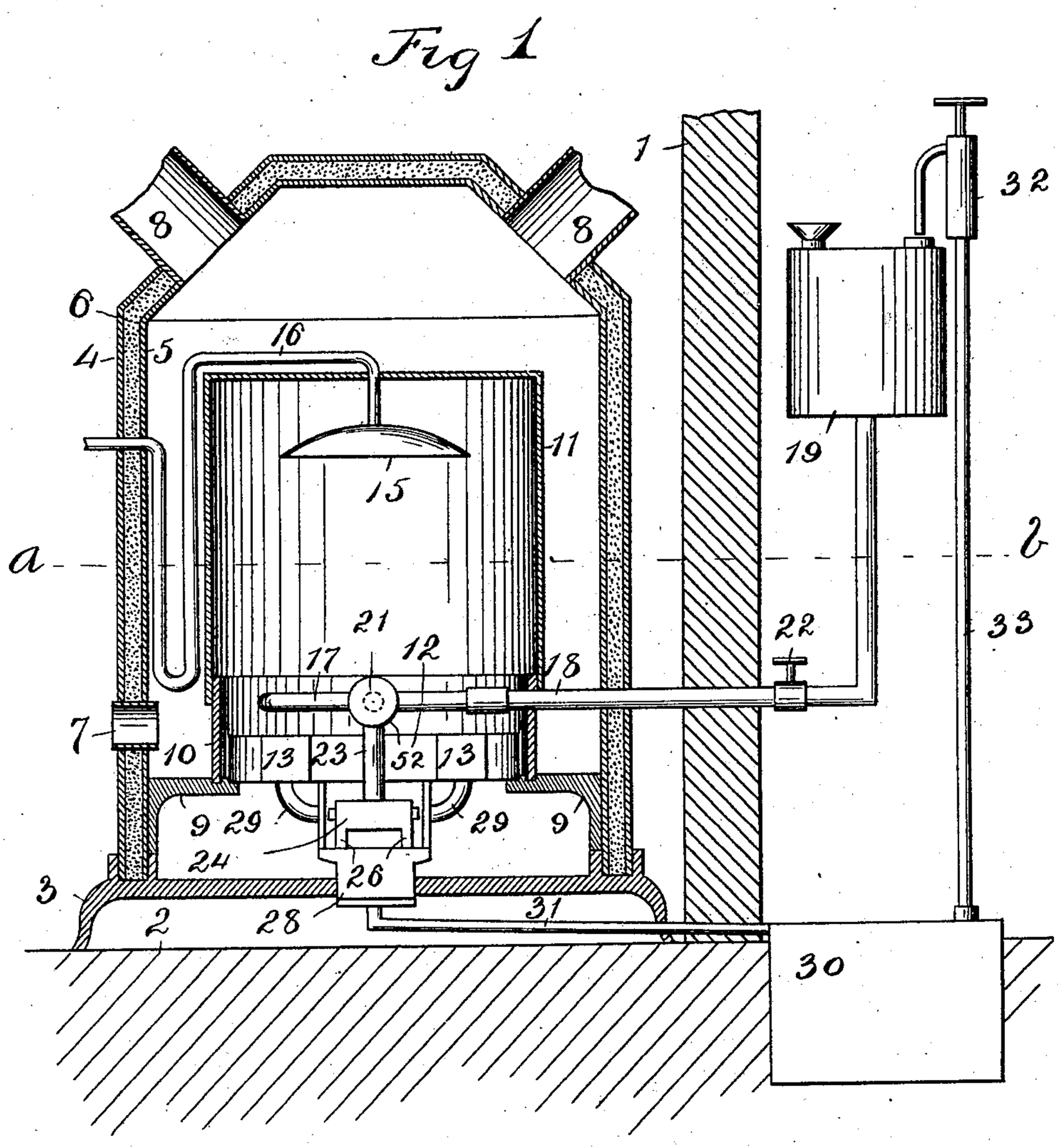
J. H. FINK.

VAPOR BURNING FURNACE.

APPLICATION FILED OCT. 13, 1902.

NO MODEL. 3 SHEETS—SHEET 1.

Fig 1



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NO MODEL. 3 SHEETS—SHEET 2.

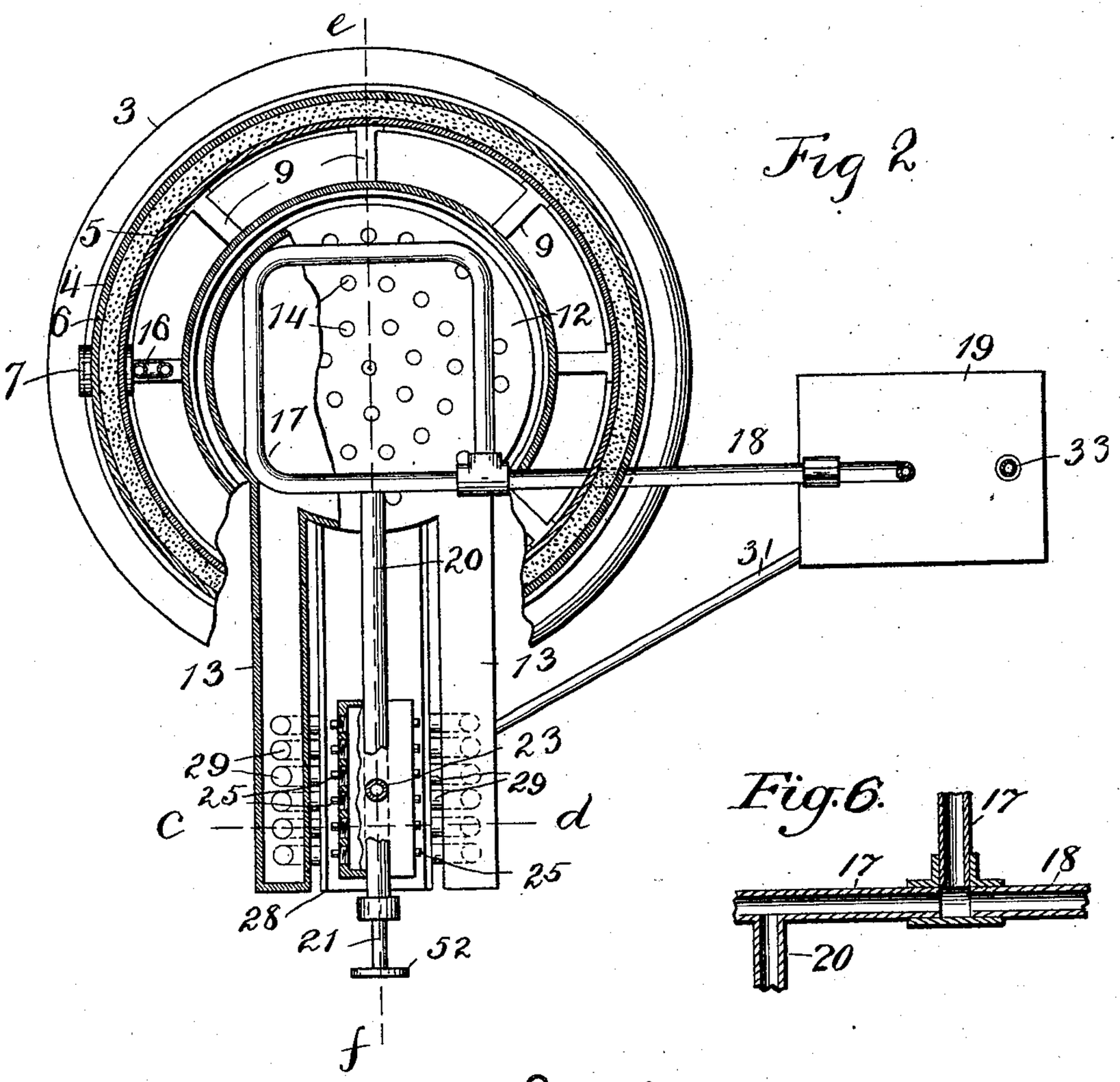

Fig 2

Fig. 6.

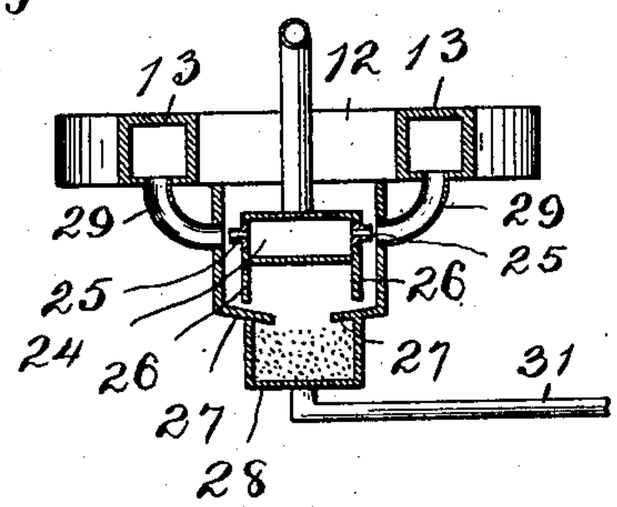

Fig 3

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NO MODEL. 3 SHEETS—SHEET 3.

Fig 4

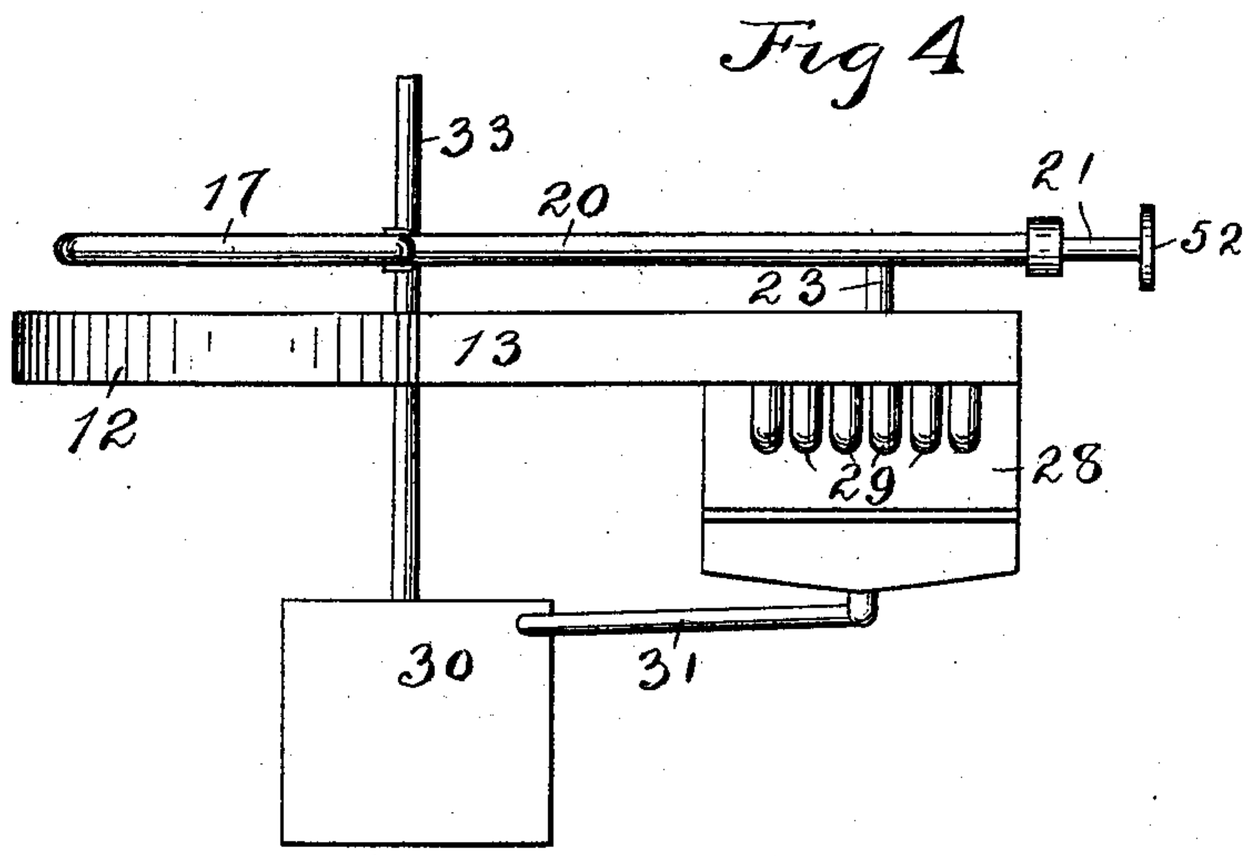
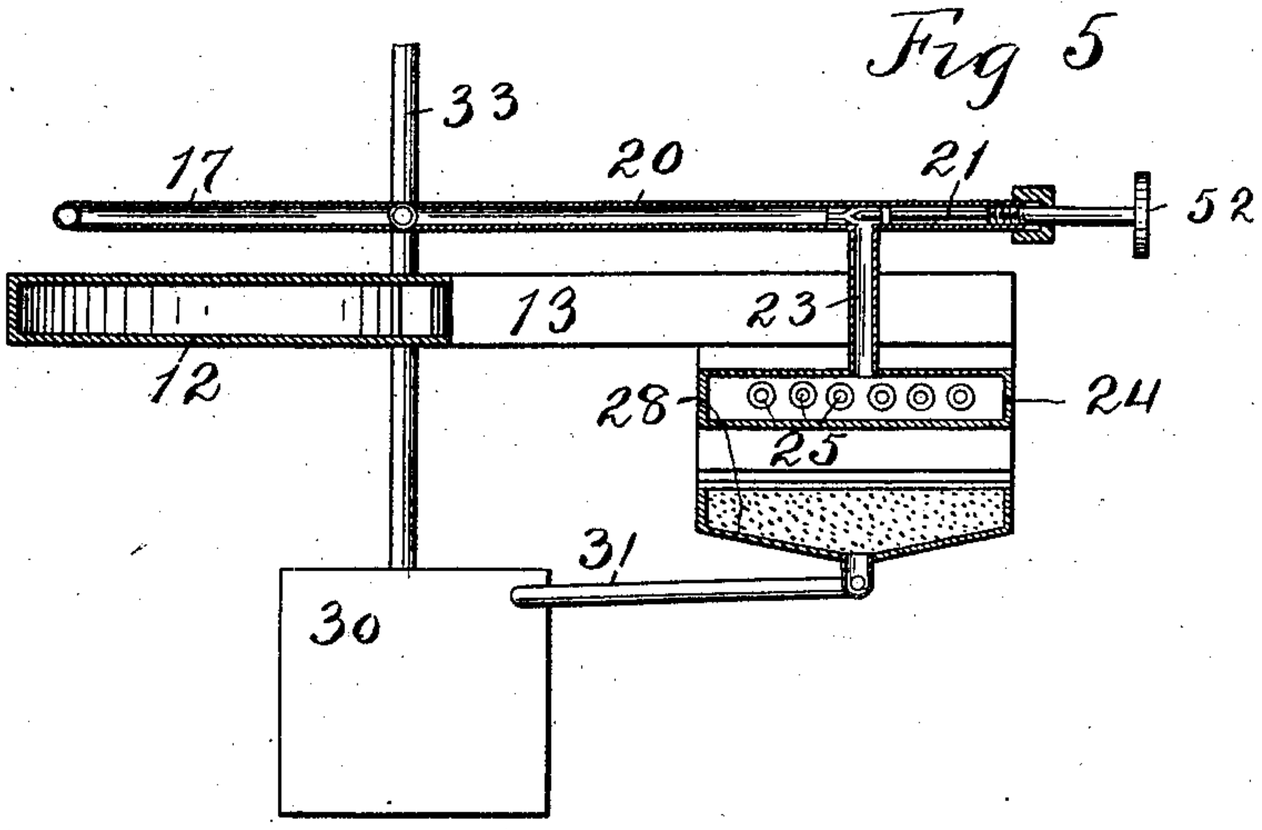


Fig 5



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No. 750,106. Patented January 19, 1904

UNITED STATES PATENT OFFICE.

JOSEPH H. FINK, OF KANSAS CITY, MISSOURI.

VAPOR-BURNING FURNACE.

SPECIFICATION forming part of Letters Patent No. 750,106, dated January 19, 1904.

Application filed October 13, 1902. Serial No. 127,085. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH H. FINK, a citizen of the United States of America, residing in Kansas City, in the county of Jackson and State of Missouri, have invented a new and useful Improvement in Vapor-Burning Furnaces, of which the following is a specification, reference being had therein to the accompanying drawings, forming a part thereof.

My invention relates to improvements in vapor-burning furnaces.

The object of my invention is to provide a vapor-burning furnace adapted to use gasolene or other fuel oils and which shall be cleanly, economical in operation, easily regulated and controlled, and which can be operated with small danger to the operator.

My invention provides certain peculiarities of construction hereinafter described and claimed.

In the drawings illustrative of my invention, Figure 1 is a vertical sectional view of the furnace; Fig. 2, a horizontal section taken on the dotted line *a b* of Fig. 1, a portion of the furnace and burner mechanism being broken away; and Fig. 3, a cross-section taken on the dotted line *c d* of Fig. 2. Fig. 4 is a side elevational view of the burner mechanism. Fig. 5 is a vertical sectional view taken on the dotted line *e f* of Fig. 2. Fig. 6 is a horizontal sectional view of the connecting parts of pipes 17, 18, and 20.

Similar characters of reference indicate similar parts.

1 indicates the wall of the building, and 2 the ground, on which the base 3 is placed.

4 is the outer casing, and 5 the inner casing, preferably cylindrical, and both mounted on the base 3 and concentric with each other.

Between the two casings or shells 4 and 5 is placed a filling comprising a non-conductor of heat, such as asbestos, and indicated by 6. An air-inlet 7 extends through both shells 4 and 5. Outlet-pipes 8 are provided in the upper ends of the shells 4 and 5. A series of radial brackets 9 are secured to the inner shell 4 and support the inner casing, comprising, preferably, a cast ring of iron 10, mounted on the brackets, and the upper part 11, preferably of sheet metal and secured to the ring 10. The upper part 11 is closed at the upper end. A circular burner 12 is disposed horizontally upon the inner ends of the brackets 9 and is provided with two parallel horizontal lateral arms 13, connected interiorly with the burner 12 and closed at their outer ends. Located in the inner casing above the burner 12, which is provided with holes 14 in its top, is a concavo-convex collector for any smoke or gas emitted from the burner. The concave side of the collector 15 is disposed down, and the collector has connected centrally to it a discharge-pipe 16, which extends through the top of the inner casing, thence horizontally, thence downward to near the inlet 7, thence upward, and thence outward horizontally through the outer casing. Air entering the inlet 7 is carried past the hot pipe 16 and is heated thereby. Above the burner 12 is located a horizontal pipe 17, connected to a pipe 18, which extends horizontally through both inner and outer casings and the wall 1, and thence upwardly, where its upper end is connected with the lower end of a supply-tank 19, adapted to contain the liquid fuel to be used. A horizontal forwardly-extending pipe 20 is connected at its rear end to the generator-pipe 17 and provided in its forward end with a valve 21, controlling the flow through the pipe 20. A valve 22 is provided in the pipe 18 to control the flow through said pipe. The upper end of a vertical pipe 23 is connected to the pipe 20 in front of the valve 21, and the lower end thereof is connected to the top of a rectangular hollow horizontal supplemental generator 24, provided at each side with a series of discharge-openings 25. The supplemental generator 24 is provided on its under sides with two vertical parallel projections 26, which extend downwardly nearly to two inclined lateral shelves 27 of a rectangular drip-cup 28, located below the supplemental generator 24, said drip-cup being provided with two vertical parallel sides, which extend above the discharge-openings 25. These vertical side plates are provided with each a series of transverse holes, in which are fitted the lower ends of a series of curved upwardly-extending tubes 29, the upper ends of which are fitted, respectively, to a series of holes pro-

vided in the lower sides of each of the arms 13. The opposite ends of the tubes 29 are disposed so as to receive vapor discharged from the discharge-openings 25. The lower part of the drip-cup is preferably filled with asbestos and is connected at its bottom to a waste-receptacle 30 by a pipe 31. Unvaporized liquid emitted from the openings 25 will enter the drip-cup and pass through the pipe 31 into the waste-receptacle. A pump 32, so located as to discharge into the top of the tank 19, is connected to the waste-receptacle 30 by a vertical pipe 33. The pump 32 may be operated to transfer liquid fuel from the waste-receptacle into the tank. The arms 13 extend outside the outer casing, and the supplemental generator 24 is located between the arms outside the outer casing.

In operating my invention the liquid fuel is first placed in the tank 19. The valve 22 and valve 21 are then opened, when the liquid fuel passes through the pipe 18 into the generator-tube 17, thence through the pipe 20 into and through the supplemental generator into the drip-cup, where it is ignited. The heat from the liquid burning in the drip-cup vaporizes the liquid in the supplemental generator 24, the vapor passing through the openings 25 into the tubes 29, by which it is carried, together with air taken up after passing from the openings 25, into the arms 13, in which the air and vapor is mixed, passing thence into the burner and from thence by the openings 14, where the mixed vapor and air is ignited. The heat from the burner 12 is then imparted to the pipe 17, thus keeping up the vaporizing process. The vapors or products of combustion issuing from the burner are collected by the collector 15 and pass, by means of the pipe 16, to the outside of the casing 11 and thence through the outer casing. The excess of oil entering the drip-cup is carried by the pipe 31 into the waste-receptacle, from which it may be replaced in the tank 19 by means of the pump 32.

My invention may be variously modified without departing from its spirit.

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

1. The combination with a drip-cup provided with two lateral vertical plates, of a burner, two mixing-chambers connected therewith, a supplemental generator located between the said two vertical plates and provided at opposite sides with a series of discharge-openings, two series of vapor-conductors located respectively one series opposite each set of discharge-openings and extending through the said vertical plates to the two mixing-chambers respectively, a generator located adjacent to the burner and connected with the supplemental generator, and provided with a supply-pipe, substantially as described.

2. The combination with an annular burner provided with two hollow arms interiorly connected therewith and disposed parallel with each other, of a generating-tube located adjacent to the burner, a supply-tank, a conductor connecting the supply-tank with the generator, a valve controlling the said conductor, a second generator located below and between the said two arms and provided with two series of discharge-openings, a conductor connecting the two generators, a valve controlling this conductor, two series of vapor-conducting tubes connected respectively with the two parallel arms and disposed respectively opposite the two series of discharge-openings, a waste-receptacle, a drip-cup located below the second generator, a pipe connecting the drip-cup with the waste-receptacle, and a pump connected with the waste-receptacle and discharging into the said tank, substantially as described.

In testimony whereof I have signed my name to this specification in presence of two subscribing witnesses.

JOSEPH H. FINK.

Witnesses:
WARREN D. HOUSE,
G. W. DUVALL.