

No. 748,458.

PATENTED DEC. 29, 1903.

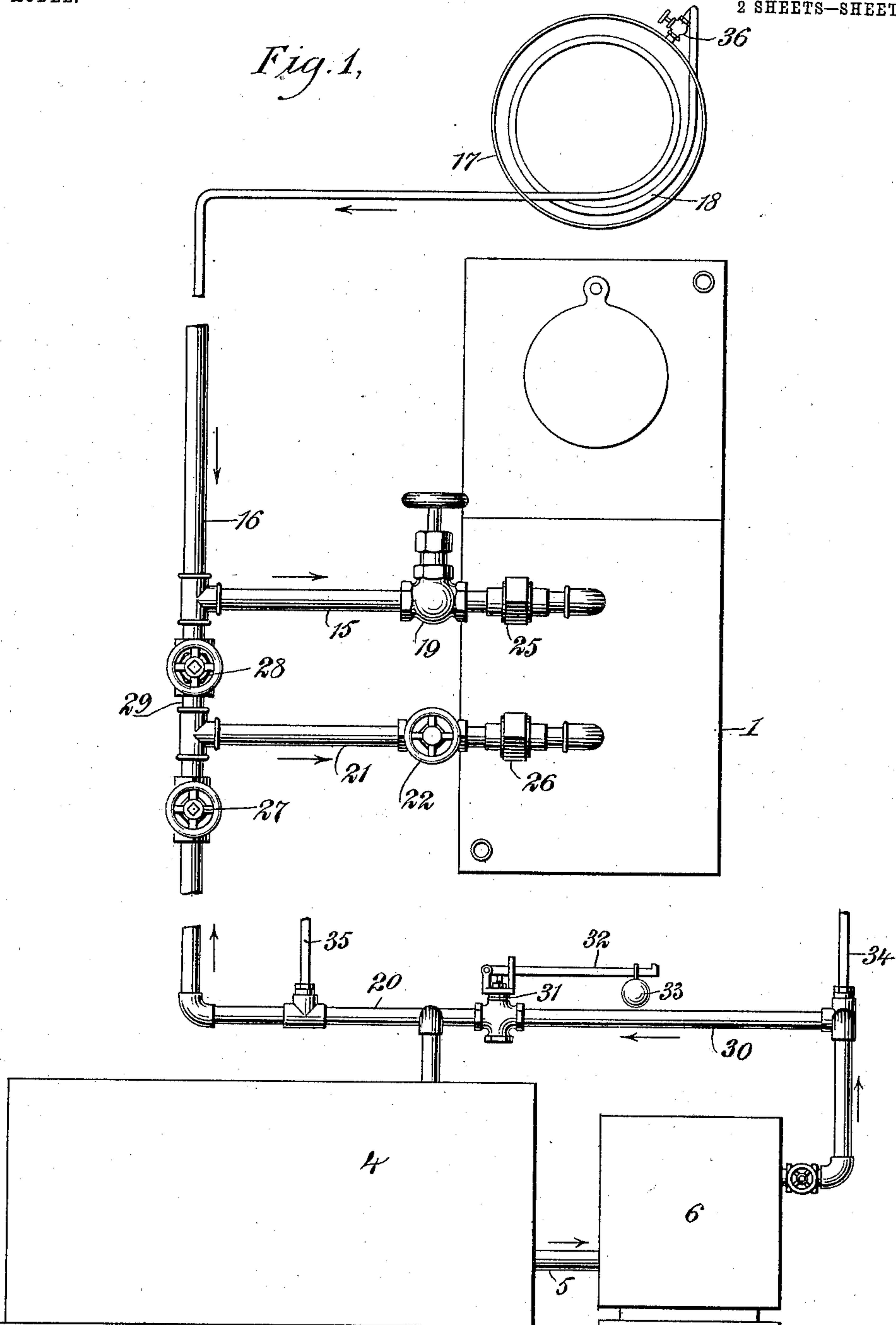
J. ANDERSON.  
MOLASSES BURNER.

APPLICATION FILED OCT. 1, 1902.

NO MODEL.

2 SHEETS—SHEET 1.

*Fig. 1,*



WITNESSES:

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*C. R. Ferguson*

INVENTOR

*John Anderson*  
BY *Munn & Co.*  
ATTORNEYS.

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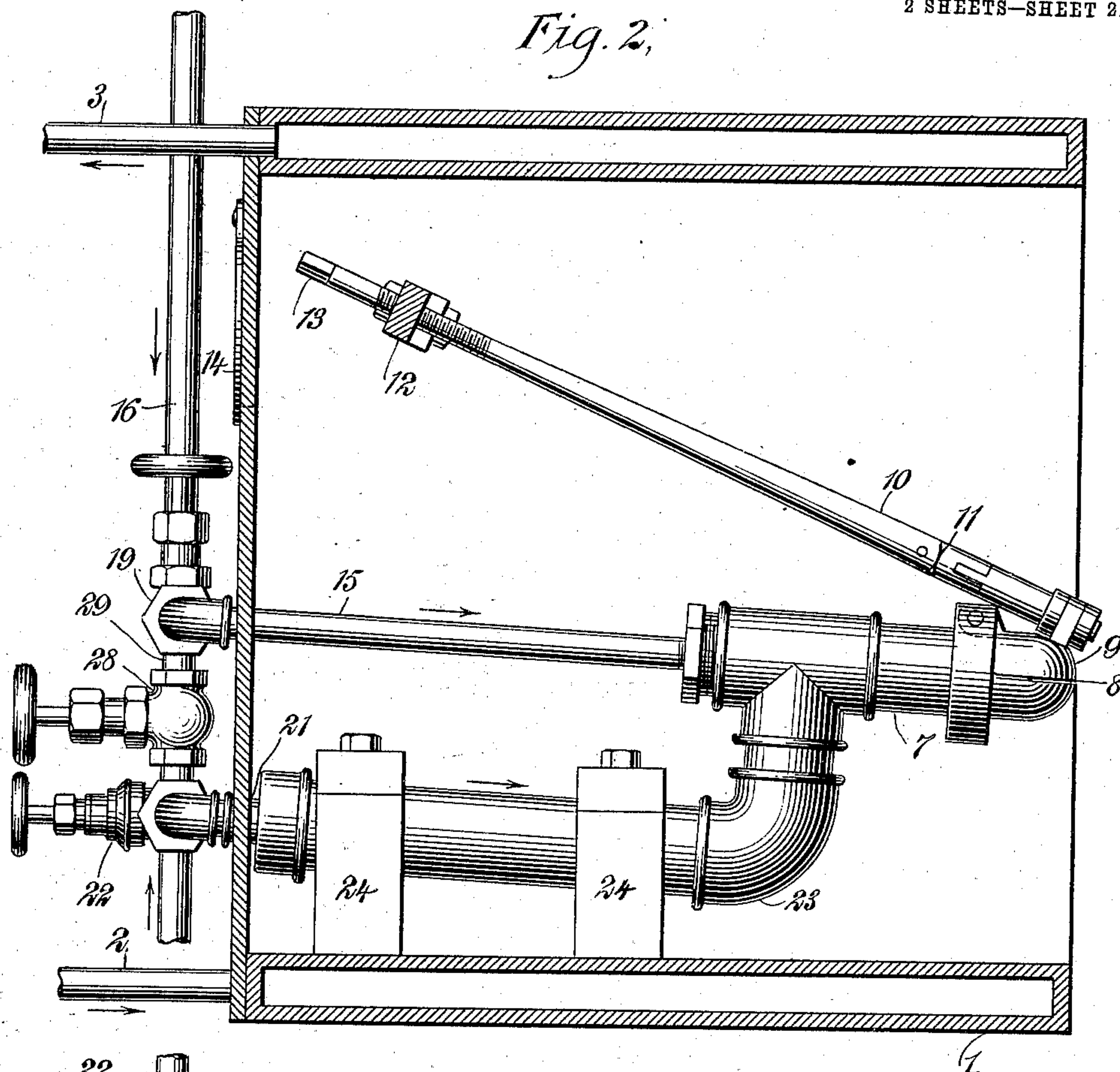
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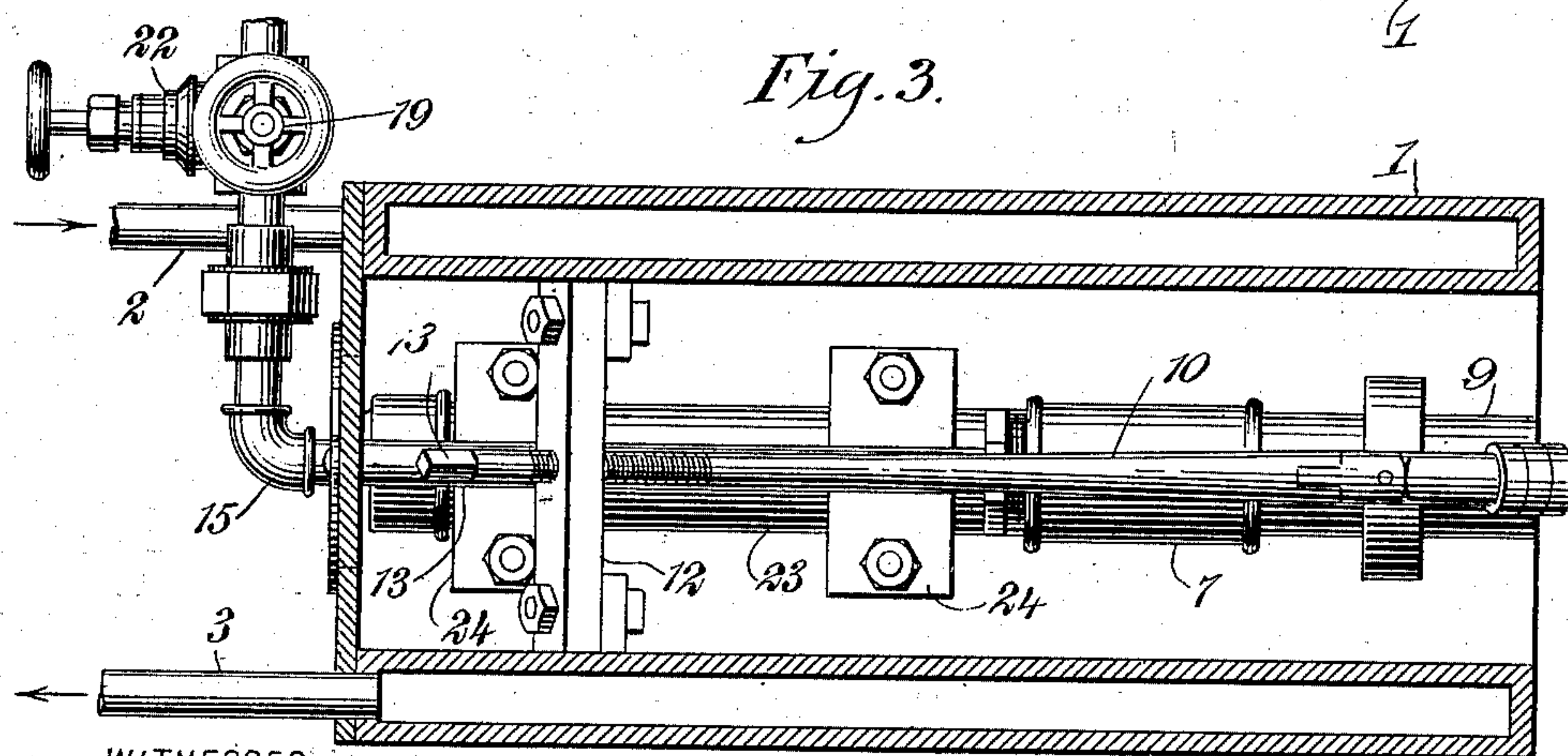
NO MODEL.

2 SHEETS—SHEET 2.

*Fig. 2.*



*Fig. 3.*



WITNESSES:

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# UNITED STATES PATENT OFFICE.

JOHN ANDERSON, OF KEALIA, TERRITORY OF HAWAII.

## MOLASSES-BURNER.

SPECIFICATION forming part of Letters Patent No. 748,458, dated December 29, 1903.

Application filed October 1, 1902. Serial No. 125,455. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN ANDERSON, a subject of the King of Great Britain, and a resident of Kealia, in the county of Kauai and Territory of Hawaii, have invented a new and Improved Molasses-Burner, of which the following is a full, clear, and exact description.

This invention relates to improvements in devices for burning waste molasses in bagasse and other furnaces, the object being to provide a simple device for utilizing waste molasses as a furnace fuel in lieu of coal, wood, oil, or the like. For successful and complete combustion the molasses must be atomized or sprayed into the furnace, and therefore my invention is constructed with this end in view.

I will describe a molasses-burner embodying my invention and then point out the novel features in the appended claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a front elevation of a molasses-burner embodying the features of my invention. Fig. 2 is a sectional side elevation, drawn on a larger scale, of the burner or atomizer; and Fig. 3 is a sectional plan view thereof.

Referring to the drawings, 1 represents a water-jacket designed to be secured in the front wall of the furnace and through which water is constantly circulated while the device is in operation and, in fact, when it is not in operation. This water comes from a pipe 2, leading from any suitable source, and discharges through a pipe 3. (See Figs. 2 and 3.)

Arranged at any suitable point is a tank 4 for containing the waste molasses, and this tank has a pipe connection 5 with a pump 6. Arranged within the water-jacket casing is a burner or atomizer, comprising a nozzle 7, having a slot-like outlet 8. The outlet portion is made in two sections—that is, its upper section 9 has pivotal connection with the body of the atomizer and from the end of this upper section 9 an operating-rod 10 extends. This operating-rod has rotary connection with the movable part 9, and it also

has a universal joint 11. The upper portion of this rod 10 is screw-threaded to engage in a tapped hole formed in a bar 12, extended across the water-jacket, as clearly shown in the drawings, and the extreme end is made angular, as at 13, to receive a turning key or wrench, which may be inserted through a sight-opening formed in the front wall of the water-jacket and having a swinging cover 14.

Leading into the forward end of the atomizer is a steam-supply pipe 15, which receives its steam from a main pipe 16, leading from a boiler 17. A portion 18 of the supply-pipe is formed in a coil in the uptake-flue at the front end of the boiler or other suitable part of the flue, so that the steam passing through the same will be superheated. (See Fig. 1.) Arranged in the pipe 15 is a regulating-valve 19.

From the pump 6 a molasses-supply pipe 20 extends, and from this supply-pipe 20 a branch pipe 21, provided with a valve 22, leads into an enlarged pipe 23, arranged in the water-jacket and communicating with the body of the atomizer. This enlarged pipe 23 is removably supported in standards 24, so that when occasion requires the whole device may be readily removed from the water-jacket by removing the upper portions of the standard and its connecting-pipes at the joints 25 26.

In the pipe 20 near the branch 21 is a cut-off valve 27, and a valve 28 is placed in a bypass pipe 29, connecting the pipes 16 and 20. A return-pipe 30, provided with a safety-valve 31, on the lever 32 of which a weight 33 is adjustable, leads from the pipe 20 into the tank 4. Branch tubes 34 35 lead from the molasses-header to a battery of boilers. These tubes 34 and 35 will be provided with suitable valves, and the tubes may be utilized for cleaning out the main supply-pipes.

In operation the molasses-pump 6 is started up while all the valves excepting the valve in the pipe 20 are closed, said valve in said pipe 20 being open. The safety-valve 31 on the pipe 30 is set to the desired pressure—say seventy-five pounds if the boiler-pressure is about one hundred pounds—and after a short time when it is seen that the pump is working properly by returning molasses to the tank 4 through the safety-valve 31 the pump may be left to itself for a while, and



the valve 36 (see Fig. 1) is opened to allow a discharge of steam from the boiler. The regulating-valve 19 is now to be opened to permit the passing out of any water of condensation, and after this has been accomplished the valve 19 is to be closed and the valve 27 opened on the molasses-line pipe. The regulating-valve 22 is now to be opened slightly, when the molasses will be seen to issue from the nozzle or atomizer in a thin sheet. The molasses in this state will not burn, but will trickle through or between the bars of the furnace-grate. Therefore the valve 19 is to be gently opened to permit a sufficient amount of steam to pass therethrough and thus atomize the stream of molasses, and in this condition the molasses will burn. If too much steam is admitted through the valve 19, the pipe 21 will become heated and the proper supply of molasses may not readily get to the burner. If too little steam is admitted through the said valve 19, the molasses will not be properly atomized and combustion will not be complete. Of course during these operations the by-pass valve 28 must be closed. A very little practice will soon teach an operator how to properly regulate the valves 19 and 22, also the speed of the pump and the pressure on the valve 31 to put through in a given time a stated amount of molasses. It is well to keep the water circulating through the water-jacket as long as the furnace is working, even though the burner be idle, as the water-jacket protects the working parts from heat, or if not desirable to keep the water circulating the burner may be removed from the case.

Should solid matter get into the atomizer and choke up the same, it may be quickly relieved by turning the rod 10 in such manner as to raise the part 9 of the atomizer, and then a puff of steam passed through the atomizer will force out the clogging material.

The working of the burner may be examined at any time without admitting injurious quantities of cold air to the furnace by swinging open the door 14.

When for any reason it is desired to shut

off the molasses from the furnace, the valve 27 is first closed and the valve 22 fully opened. Then the by-pass valve 28 is opened, admitting steam to the molasses-pipe section 21, so that the steam will blow all the material out through said pipe-section and the atomizer.

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

1. The combination with a furnace, a molasses-tank, and a pump connected with the tank, of vertical standards mounted in the furnace, a burner or atomizer detachably mounted on the standards in the furnace, said atomizer having a rod-controlled hinged head portion, a steam-supply pipe leading in the forward end of the atomizer, a molasses-supply pipe leading from the pump, an enlarged elbow-pipe leading into the body of the atomizer, said enlarged pipe being adapted to permit the spreading of the stream of molasses received from the supply-pipe, a valve connection between the enlarged pipe and the molasses-supply pipe, and a jacket surrounding the atomizer and enlarged pipe.

2. The combination with a furnace, a molasses-tank and a pump connected with the tank, of a burner or atomizer detachably mounted on standards within the furnace, said atomizer having a hinged head portion, a universal jointed rod rotatably connected with the head of said atomizer, a steam-supply pipe leading in the forward end of the atomizer, a molasses-supply pipe leading from the pump, an enlarged pipe leading into the body of the atomizer and adapted to permit the spreading of the stream of molasses received from the supply-pipe and the valve connection between the enlarged pipe and molasses-supply pipe.

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

JOHN ANDERSON.

Witnesses:

T. F. SANBORN,  
FR. RIEDEL.