

No. 639,257.

Patented Dec. 19, 1899.

H. LUCKENBACH.

APPARATUS FOR VOLATILIZING AND BURNING OIL.

(Application filed July 3, 1899.)

(No Model.)

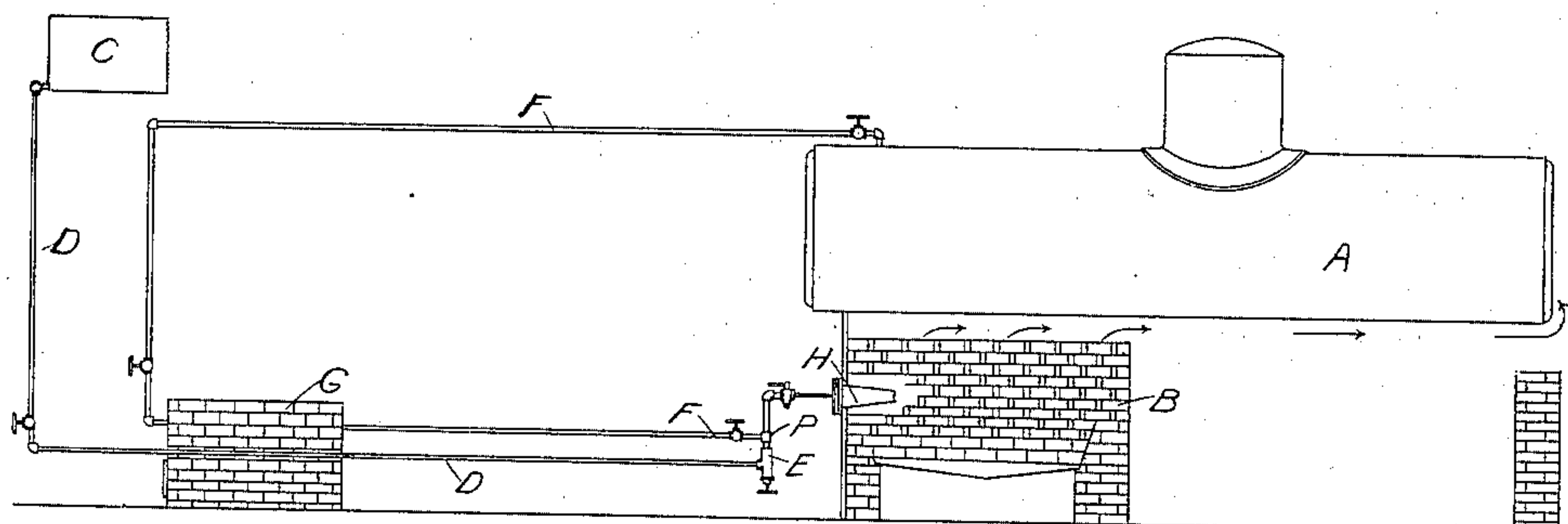


Fig. 1.

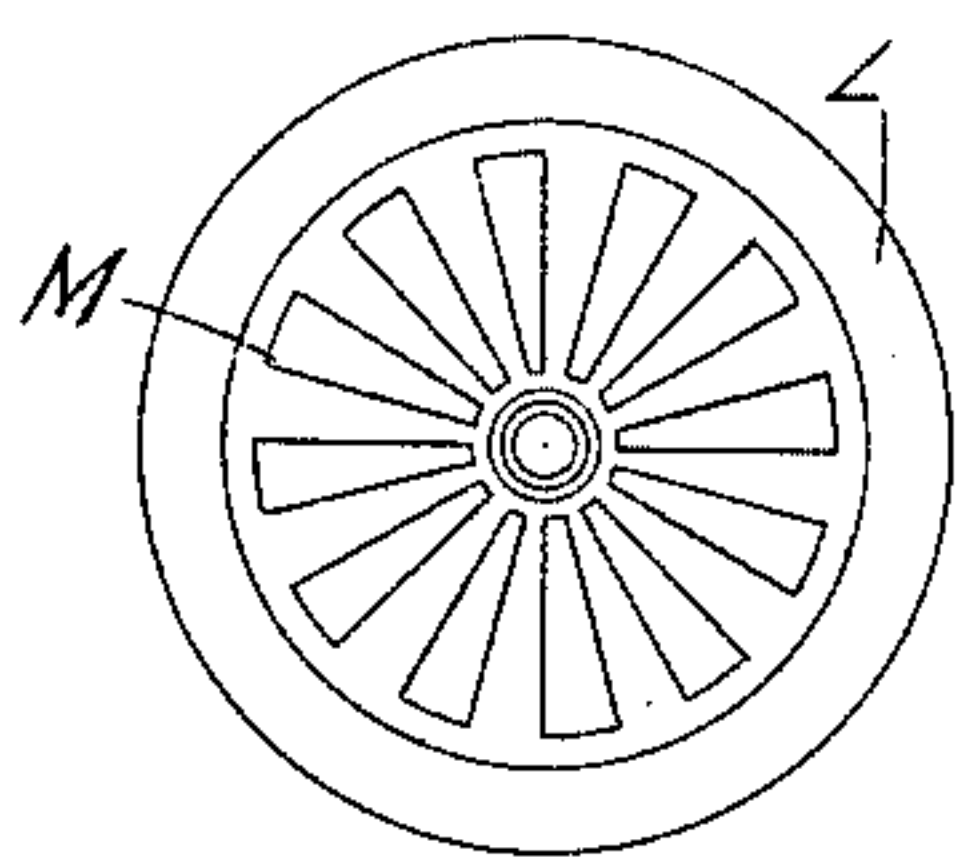


Fig. 3.

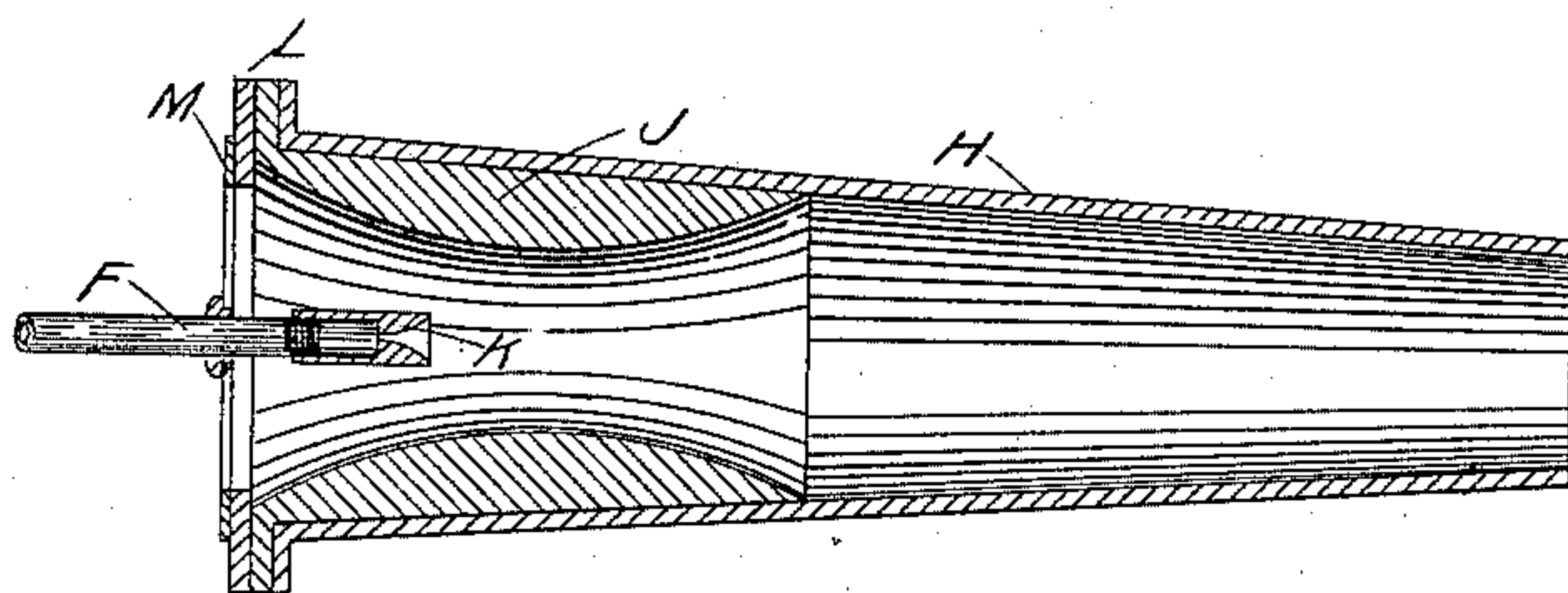


Fig. 2.

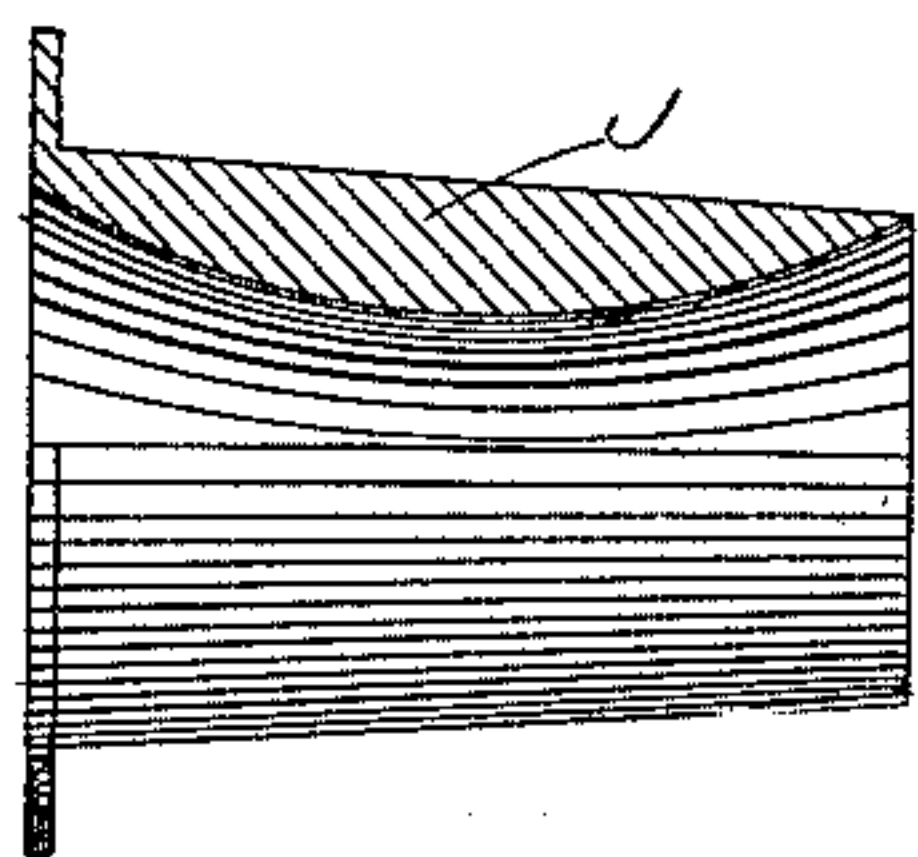


Fig. 4.

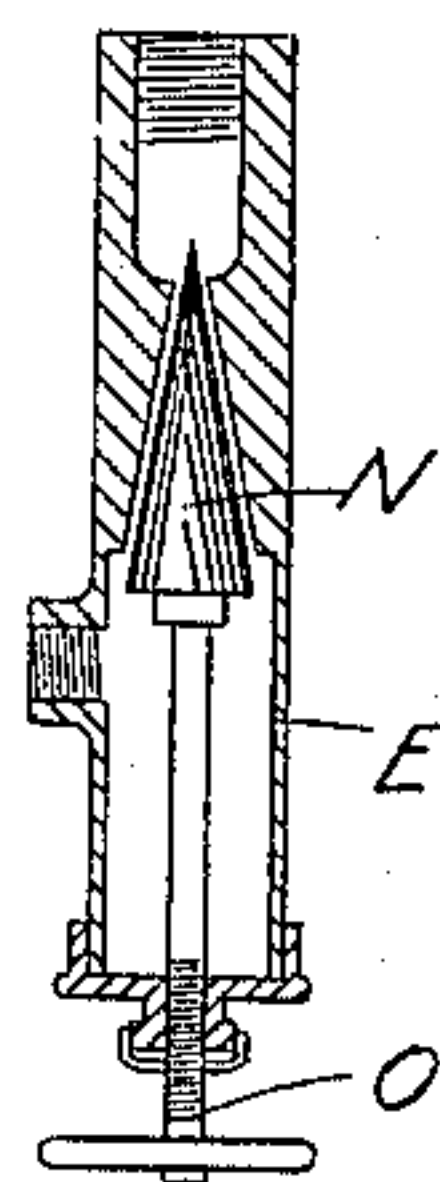


Fig. 5.

WITNESSES:

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APPARATUS FOR VOLATILIZING AND BURNING OIL.

SPECIFICATION forming part of Letters Patent No. 639,257, dated December 19, 1899.

Application filed July 3, 1899. Serial No. 722,780. (No model.)

To all whom it may concern:

Be it known that I, HARRY LUCKENBACH, a citizen of the United States, residing at Seattle, in the county of King and State of Washington, have invented certain new and useful Improvements in Apparatus for Volatilizing and Burning Oil, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to certain new and useful improvements in apparatus for volatilizing and burning oils; and it consists of the novel construction and combination of parts hereinafter described, and pointed out in the claims.

The object of my improvements is to provide a means whereby the gases of oils may be more economically utilized as fuel, which improvements are fully set forth in this specification and accompanying drawings, in which—

Figure 1 is a vertical elevation of a boiler with my device attached thereto. Fig. 2 is an enlarged sectional view of the nozzle; Fig. 3, an end view of the same. Fig. 4 is an enlarged view of the bushing, partly in section; and Fig. 5 is an enlarged sectional view of the oil-supply-regulating valve E, Fig. 1.

Similar letters refer to corresponding parts throughout the several views.

In the drawings, A represents a boiler to which my apparatus is applied. Within the furnace of said boiler is the heat accumulator and distributor B, formed of fire-brick or other non-combustible material, with spaces or passages running therethrough.

C is an oil-reservoir from which oil is supplied for fuel, though, if preferred, mechanical supply may be substituted therefor. Connection is established between the reservoir and furnace by the pipe D, through which the oil is drawn by the action of steam within the steam-pipe F, which pipe makes communicative connection between an independent steam-boiler or directly from the operating-boiler, as shown in Fig. 1. I prefer to use in the steam-pipe F, though not essential to the working of the apparatus, a superheater G, which may be of any approved form, as the drier and hotter the steam the more perfect will be its combination with the vaporized

oil. The steam-pipe F is connected with the oil-supply pipe D through and by the fitting P, located between the regulating-valve E and the injector H. This regulating-valve E is of a cone shape N, Fig. 5, and tapers to a sharp point to make an even annular delivery of the oil in transit to the injector, and O is a screw-spindle to control the opening of said valve. On the end of the pipe projecting within the furnace is the injector H, comprising a nozzle K having a small orifice with an expanding bell-shaped mouth, a bushing within the shell or twyer of the injector, and which is formed with oppositely-opening bell-mouths, and a register L and rotatable damper M at one end, which extends without the furnace.

The operation of the apparatus is as follows: Steam passing through the pipe F is raised to a high temperature and dried in the coils of the superheater, which by suction draws the oil through the valve E, and the steam readily vaporizes and mingles intimately with the oil-vapor, and, entering the injector, a quantity of air is sucked in through the register and around the nozzle K, where the air mixes with the mingled oil-vapor and steam and furnishes the necessary oxygen for complete combustion, which is accomplished by being delivered upon the previously-heated accumulator or distributor that shortly, under the influence of the burning hydrocarbon gases, is heated to a glowing heat.

Important features of my device are, first, the form of the jet-nozzle K, with a small orifice and expanding mouth adapted to disseminate the mingled oil and superheated steam within the path of the inflowing air; second, the form of the bushing J, with a wide mouth at the point of intake of the air adjacent to the register L, gradually contracting the area of opening to accelerate the velocity of the air and also to concentrate the same for mixture, which being accomplished I enlarge this opening within the bushing to disseminate the entire combination, as was done with the two first-mentioned constituents, and, third, the accumulator, which in an incandescent heat insures the entire consumption of the fuel and distributes the contained heat evenly to the boiler.

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

1. In an apparatus of the class described, the combination with a steam-generator, and a heat accumulator and distributor, of a device for injecting the commingled vaporized oil and gases upon said accumulator comprising a twyer, a bushing arranged entirely within said twyer and provided with bell-mouthed ends and a neck intermediate thereof, and a nozzle projecting within said bushing and having an orifice terminating in a bell-shaped mouth, means for controlling the delivery of air to said twyer, communicative connections between the steam-generator and the injecting device, an oil-supply, communicative connections also between said oil-supply and the injecting device, and means for controlling the supply of the oil.

2. In an apparatus of the class described, the combination with a steam-generator, and a heat accumulator and distributor, of a device for injecting the commingled vaporized

oil and gases upon said accumulator comprising a twyer, a bushing arranged entirely within said twyer and provided with bell-mouthed ends and a neck intermediate thereof, and a nozzle projecting within said bushing and having an orifice terminating in a bell-shaped mouth, means for controlling the delivery of air to said twyer, communicative connections between the steam-generator and the injecting device, a superheater arranged intermediate said generator and the injecting device and exterior of the furnace of the steam-generator, an oil-supply, communicative connections also between the oil-supply and the injecting device, and means for controlling the supply of the oil.

In testimony whereof I affix my signature, in presence of two witnesses, this 21st day of June, A. D. 1899.

HARRY LUCKENBACH.

Witnesses:

FRANK BROWN,
PAUL BARNES.