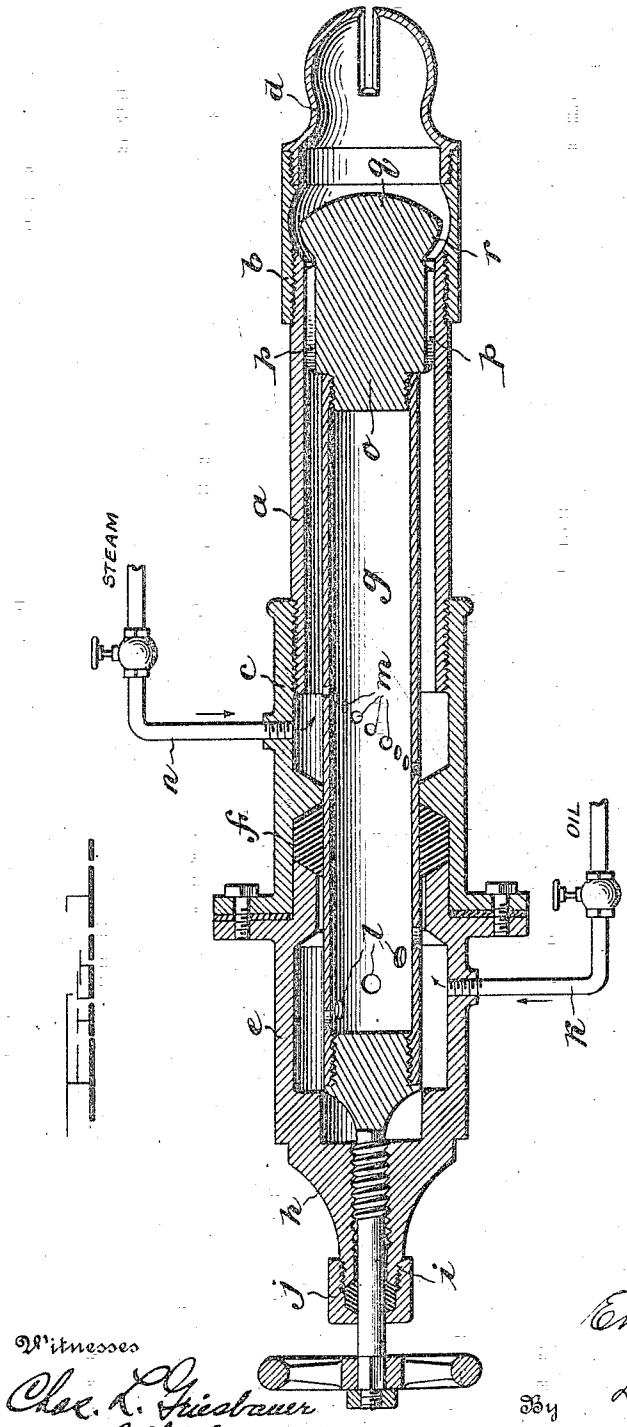
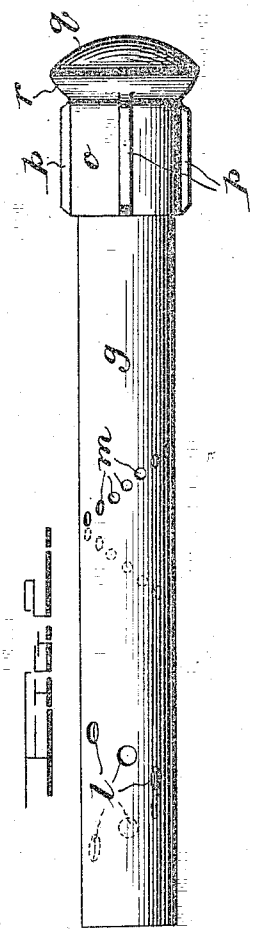
E. N. SHAW.

CRUDE OIL BURNER.

APPLICATION FILED MAY 7, 1914.

1,127,815. Patented Feb. 9, 1915





Witnesses

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UNITED STATES PATENT OFFICE.

EMMERSON N. SHAW, OF SAN FRANCISCO, CALIFORNIA.

CRUDE-OIL BURNER.

1,127,815. Specification of Letters Patent. Patented Feb. 9, 1915.

Application filed May 7, 1914. Serial No. 836,925.

To all whom it may concern:

Be it known that I, EMMERSON N. SHAW, a citizen of the United States of America, and a resident of San Francisco, county of San Francisco, State of California, have invented certain new and useful Improvements in Crude-Oil Burners, of which the following is a full and clear specification, reference being had to the accompanying drawings, in which—

Figure 1 is a longitudinal sectional view of a burner embodying my invention in one of its forms; and Fig. 2 is a detail side elevation of the oil tube or cylinder.

This invention has relation to that type of burners adapted for use with crude or other heavy oils in which the oil is atomized by means of a supply of steam and the object of this invention is to greatly increase the efficiency of the burner, to reduce noise of operation to a minimum, and to materially simplify the construction and adjustment of the burner, as more fully hereinafter set forth.

The main or outer casing of the burner consists of a tube *a* to whose forward end is screwed a short cylinder *b* and to whose rear end is secured a cylinder *c*. Screwed into the forward end of the coupling tube *b* is a nozzle *d*, and fastened to the outer end of the tube *c*, by means of flanges and bolts is a cylinder *e*, a suitable stuffing box being formed between the parts *e* and *c*, through which stuffing box *f* is adapted to slide a tube *g*. Formed on the rear end of the cylinder *e* is a cap *h* through which extends a screw stem *i*, a stuffing box *j* being provided to make a steam and oil-tight joint between the rod and the cap. The outer end of the rod is provided with an operating handwheel while the inner end of the rod is attached to the outer end of tube *g*.

An oil pipe *k* is attached to the cylinder chamber formed between the tube *g* and the part *e* of the casing, and from this cylinder chamber a series of spirally arranged holes *l* communicate with the interior of tube *g*. At a point beyond the stuffing box *f* the tube *g* is in constant communication with the space between it and the parts *c* and *a* by means of a spirally arranged series of openings *m*, said space being connected to a steam supply *n*.

Fastened to the front end of the tube *g* is a cylindrical plug *o* provided on its exterior with radial longitudinal ribs *p*, which ribs bear against the interior of the tube *a* and guide the tube *g* in its back and forth movements. Formed on the forward end of the plug *o* is a valve *q* which consists substantially of a circular head larger in diameter than the interior diameter of tube *a* and rounded annularly at *r*, this rounded surface *r* being connected to the cylindrical surface of the plug at the outer end of the plug. The adjacent end of the tube *a* is similarly rounded, and the inner face of the tube *b* is concaved at a point adjacent to the said inner end of tube *a*.

It will be seen that the oil enters the tube *g* through the openings *l* and makes its exit therefrom through the openings *m* into the steam space, and that this mixed oil and steam are carried forward and ejected at the nozzle. It is preferred that the capacity of the oil supply and the openings *l* shall be sufficiently greater than the capacity of the exit holes *m* that the tube *g* shall be practically filled with oil at all times, so that the oil will be forced out of said tube into the steam chamber in a series of jets issuing at all points around said chamber. The hot steam converts the oil in the tube *g* into a foamy condition and this foam is ejected through the openings *m*, where it is atomized by the steam. This atomized oil is carried by the steam past the valve *q*. As this mixture passes the valve, the rounded shape of the valve surface *r*, together with the concave formation of the interior of the tube *b*, causes the mixture to be violently swirled about in the chamber beyond the valve, thus bringing about a thorough admixture of the oil and the steam before the mixture issues from the nozzle. It will, therefore, be seen that the forward end of the outer casing, to wit, the short tube *b*, together with the hollow nozzle, form a mixing chamber immediately adjacent to the exit of the nozzle. The nozzle is shown substantially spherical, but it will be understood that the shape may be greatly varied. The exit slot in the nozzle extends across the center of the nozzle, but it will be understood that it may extend in any direction and be located in any part of the nozzle. It will be seen that the nozzle slot is beveled inwardly so as to bring its outer corner to an edge, thereby insuring a flame of uniformity.

It will be understood that by adjusting the tube *g* forwardly and backwardly, the amount of mixture passing into the nozzle

can be determined, while, by manipulating the valves of the steam and oil pipes as well as the pressure of the steam and oil, the relative amounts of oil and steam may be readily regulated.

Having thus described my invention, what I claim is:

In a burner of the class set forth, the combination of a tubular casing provided at one end with a nozzle and having its other end closed and also provided near its rear end with an interior stuffing box, a tube inclosed within said casing and slidable back and forth through said stuffing box, means for sliding the tube back and forth, a nozzle valve at the inner end of the tube, said tube being provided with perforations at the rear of the stuffing box and also with a circumferential series of oil outlets at a point just in front of the stuffing box, a steam pipe communicating with the interior of the casing at a point in front of the stuffing box, and an oil pipe communicating with the interior of the casing at a point to the rear of the stuffing box.

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

EMMERSON N. SHAW.

Witnesses:
GEO. L. STEWART,
PARK H. TYRRELL.