No. 710,898. Patented Oct. 7, 1902.

E. J. SHARP.

OIL BURNER.

(Application filed Mar. 10, 1902.)

(No Model.)

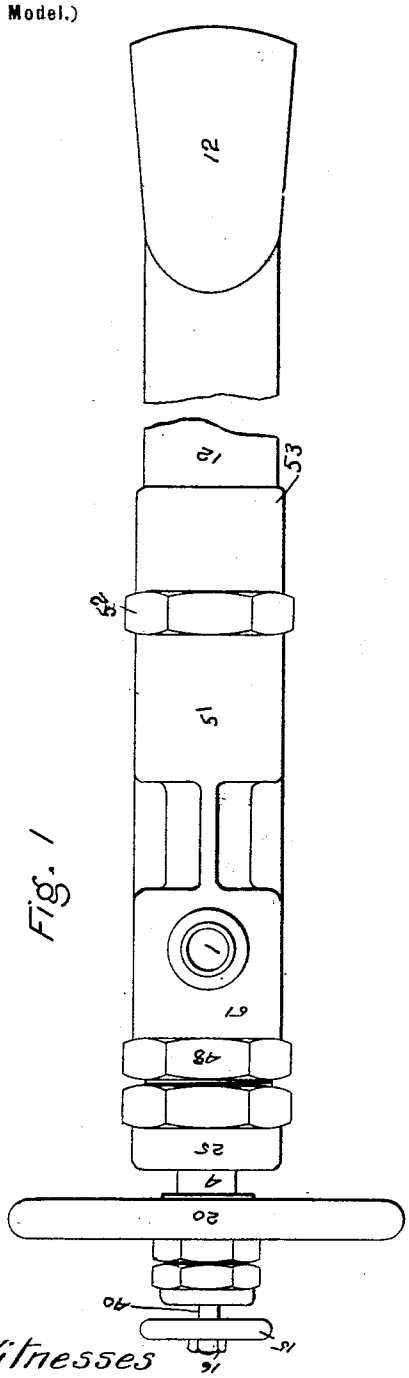

Fig. 1

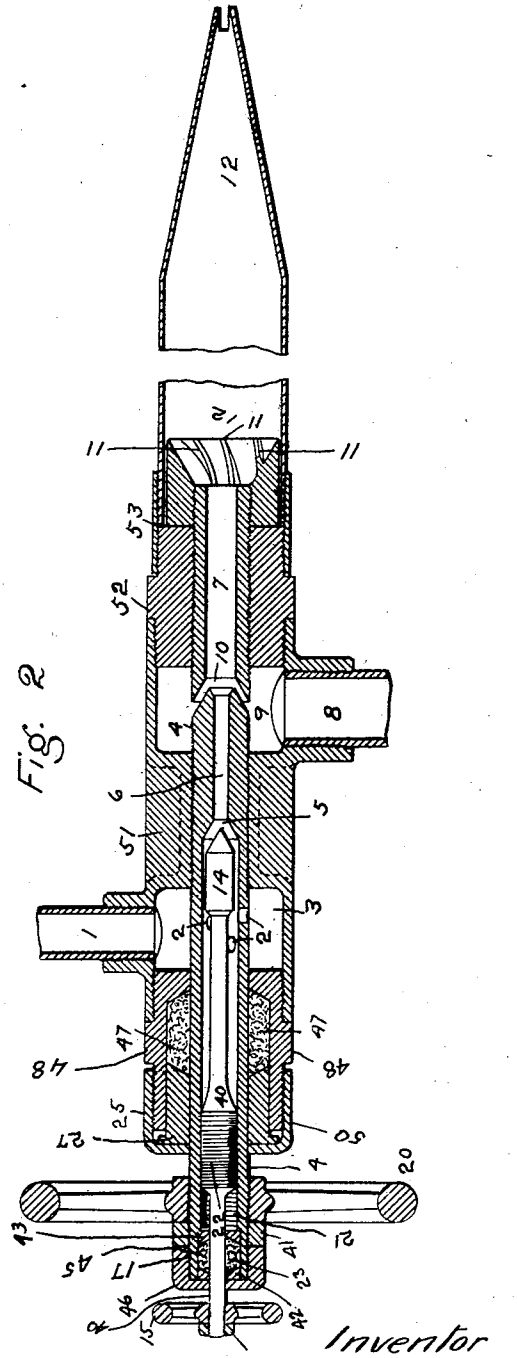

Fig. 2

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UNITED STATES PATENT OFFICE.

EDWARD J. SHARP, OF ALHAMBRA, CALIFORNIA.

OIL-BURNER.

SPECIFICATION forming part of Letters Patent No. 710,898, dated October 7, 1902.

Application filed March 10, 1902. Serial No. 97,628. (No model.)

To all whom it may concern:

Be it known that I, EDWARD J. SHARP, a citizen of the United States, residing at Alhambra, in the county of Los Angeles, State of California, have invented and discovered a new and useful Improvement in Oil-Burners, of which the following is a specification.

This invention relates to improvements in oil-burners; and some of the objects are, first, to provide a burner that can be economically manufactured and will at the same time afford thorough combustion of the oil; second, to produce a burner in which the elements supporting combustion are intimately mixed before combustion actually takes place, and, third, to afford facilities for heating and thoroughly mingling the substances utilized in maintaining combustion prior to the chemical union of the same. I attain these and other objects by the construction illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of the burner; and Fig. 2 is a longitudinal sectional view of the burner, taken through the center thereof.

Similar numerals refer to like parts throughout both views.

The numeral 1 designates the pipe through which steam is conveyed under pressure into the steam-chamber 3, thence through the port 2 and through the steam-valve 5 into the steam-valve chamber 6, making its exit therefrom and passing through the oil-valve 10 into the mixing-chamber 7, and, together with the oil, the steam passes out of the flared curved ridged end 11 of the mixing-chamber 7 into the expansion-chamber 12, having a nozzle where the disintegrated elements of the oil and steam are mixed and intimately mingled, pass therefrom, and are burned at the nozzle or end of the said expansion-chamber.

The influx of the superheated steam into the steam-valve chamber 6 is regulated by means of the valve 14 and valve-stem 40, provided with a hand-wheel 15, which is secured upon the outer end of the valve-stem 40 by means of the nut 16.

The oil flows into the oil-chamber 9 through the pipe 8 under pressure, gravity, or suction caused by the ingress of steam through the oil-valve 10, and the steam passing under pressure through the pipe 1 into the steam-chamber 3, thence through the ports 2 and through the steam-valve 5 into the steam-chamber 6, and out through the oil-valve 10 into the mixing-chamber 7 creates a vacuum in the oil-chamber 9 and mixing-chamber 7, which causes the oil to flow through the pipe 8 and into the oil-chamber 9 and mix thoroughly with the steam in the mixing-chamber 7. From thence the mingled oil and steam pass on together out of the flared curved ridged end 11 of the mixing-chamber 7 into the expansion-chamber 12, and issuing from the end or nozzle of the said expansion-chamber combustion takes place. The superheated steam and the inflowing oil thoroughly mingled, the oil with its temperature elevated by the steam, furnish the requisite elements for perfect combustion, to which reference will hereinafter be made.

The oil-valve stem 4 is externally screw-threaded at the upper end at 17 to receive the internally-screw-threaded cap 46, clamping-ring 41, and hand-wheel 20. The oil-valve stem 4 is also internally screw-threaded at 21 a short distance from the outer end, where it projects from the casing-cap 25 of the burner to receive the externally-screw-threaded enlarged portion 22 of the steam-valve stem 40. At the extreme end portion of the oil-valve stem 4 is a recessed receptacle 45 to receive the packing 23, and above and below the packing are two washers 42 and 43, through which the steam-valve stem 40 passes, as well as through the cap 46, which when screwed down upon the screw-threaded end of the oil-valve stem securely hold the packing 23 in place between the two washers 42 and 43.

The casing-cap 25 is internally screw-threaded to receive the external screw-threads upon one end of the stuffing-box 48, which contains the packing 47 and surrounds a portion of the oil-valve stem 4 within the stuffing-box. The other portion of the oil-valve stem within the stuffing-box is surrounded by and in contact with the flange-ended sleeve 27, the said flanged end thereof being in contact with the inner face of the casing-cap 25, while the opposite end rests upon the packing 47.

The central portion 51 of the casing is provided with two inlets, one for the steam, the other for the oil, and is referred to by reference-numerals 1 and 8, respectively. Each

end of said central portion 51 is screw-threaded, one end for receiving the external screw-threads on the stuffing-box 48, the opposite end thereof adapted to receive the external screw-threads upon one end of the sleeve 52. The sleeve 52 is also screw-threaded externally at the opposite end from the central portion 51 in order to receive the internal screw-threads upon the thimble 53. The sleeve 52 is also screw-threaded internally in order to hold in place the externally-threaded mixing-chamber 7. Upon the end of the mixing-chamber 7 which projects into the expansion-chamber 12 the flared curved ridged end portion 11 is screwed thereon. One end of the expansion-chamber 12 is screw-threaded externally and adapted to receive the internal screw-threads on the abutting end of the thimble 53.

I do not desire to confine this invention to the specific construction, combination, and arrangement of the parts therein shown and described, and the right is reserved to make all changes in and modifications of the same as come within the spirit of this invention.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In an oil-burner having a casing, the expansion-chamber provided with a nozzle or burning-orifice secured thereto, the mixing-chamber provided with an expanded mouth having curved ridges, and a valve-seat within which the oil-valve stem is adapted to be seated, the oil-valve stem, the steam-valve stem, and means for operating the valve-stems and controlling the supplies to the same.

2. In a burner provided with a casing, the expansion-chamber having a nozzle or burning-orifice fastened thereto, the mixing-chamber having an expanded curved, ridged mouth at one end and a flaring seat in the opposite end thereof, within which the oil-valve stem is adapted to be seated, the oil-valve stem having a valve-seat therein and made integral therewith, the steam-valve stem adapted to be seated in the valve-seat within the oil-valve stem and devices for operating the valve-stems and for controlling the supplies to the valve.

3. In an oil-burner, the casing, the expansion-chamber having a nozzle or burning-orifice fastened to the casing, the mixing-chamber provided at one end with an outwardly-flaring valve-seat and at the other end with an expanded mouthpiece having upon the inner surface thereof curved ridges, the oil-valve stem adapted to fit within the said valve-seat, the said oil-valve stem having a steam-valve seat therein and made integral therewith, the steam-valve stem adapted to be seated within the valve-seat in said oil-valve stem and devices for operating the valve-stems.

4. In an oil-burner, the casing, the expansion-chamber having a nozzle or burning-orifice secured thereto, the mixing-chamber provided at one end with a flaring expanded valve-seat, and at the opposite end thereof with an expanded, outwardly-flaring mouthpiece, said mouthpiece provided, on the inner face thereof with curved ridges, the oil-valve stem having a cone-shaped end adapted to be seated within the valve-seat of the mixing-chamber, said oil-valve stem provided with a steam-valve chamber, and outwardly-flaring steam-valve seat, the steam-valve stem adapted to be seated within the valve-seat of the oil-valve stem, means for operating the valve-stems and for supplying oil and steam to the burner.

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

EDWARD J. SHARP.

Witnesses:
AMELIA GUEST,
GAIL BORDEN.