

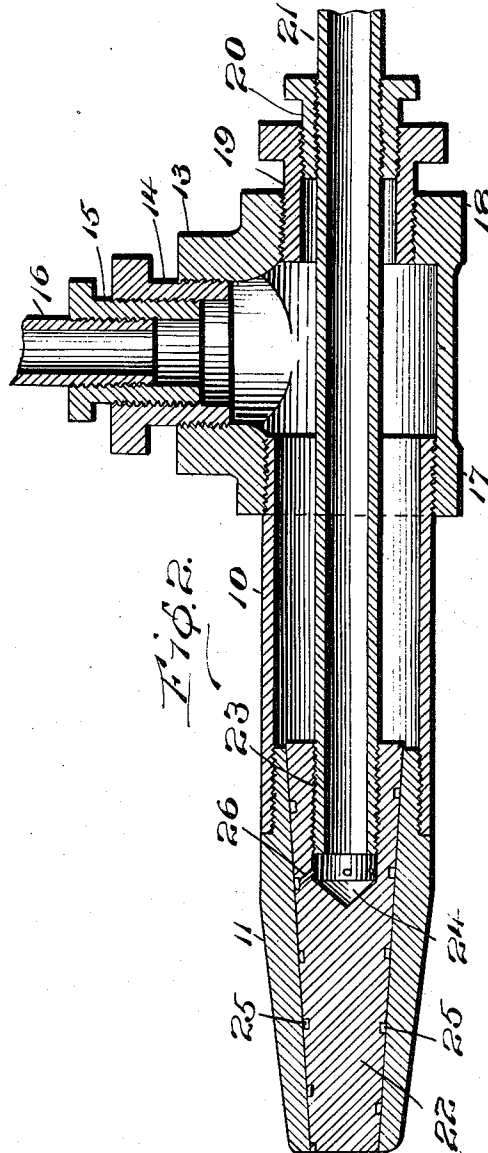
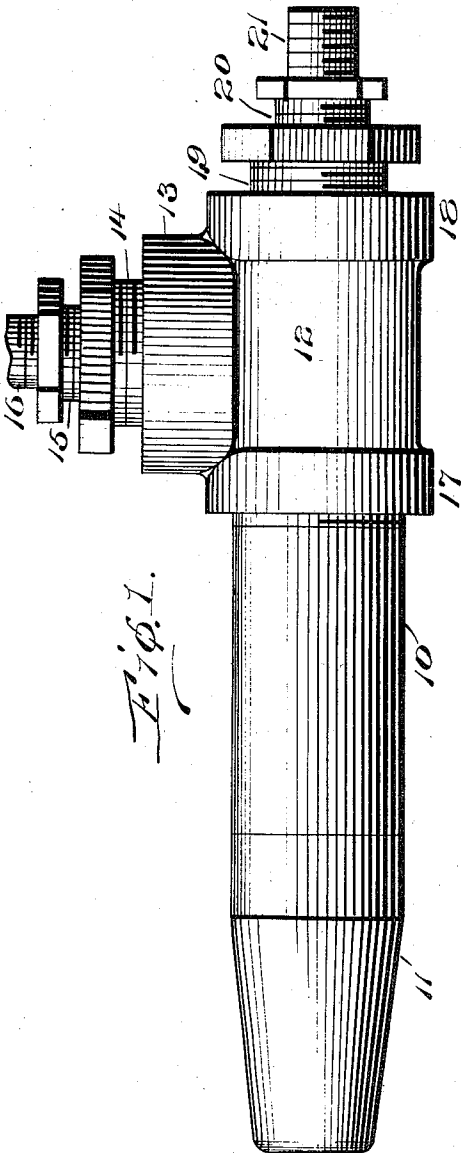
J. B. COWPER.
OIL BURNER.

APPLICATION FILED MAR. 28, 1911.

Patented June 11, 1912.

2 SHEETS—SHEET 1.

1,029,048.



Witnesses

M. Fowler Jr.
A. S. Lockman

Inventors

John B. Cowper
C. J. Stockman

Attorneys

J. B. COWPER.
OIL BURNER.

APPLICATION FILED MAR. 28, 1911.

1,029,048.

Patented June 11, 1912.

2 SHEETS—SHEET 2.

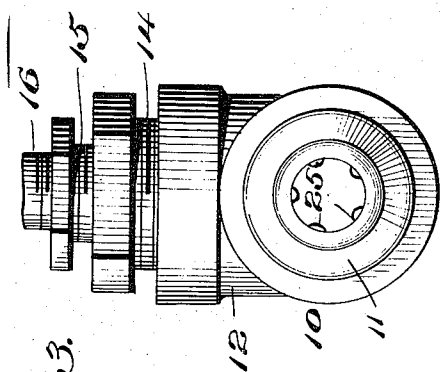


Fig. 3.

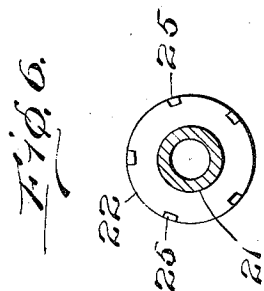


Fig. 6.

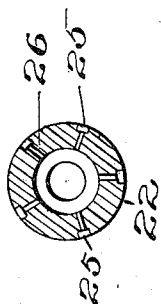


Fig. 5.

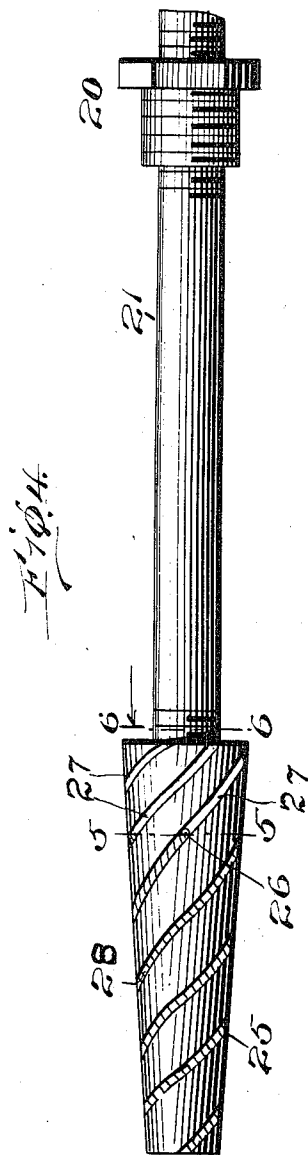


Fig. 4.

Witnesses

M. S. Cowper
A. S. Stockman

John B. Cowper Inventors
C. J. Stockman Attorneys

UNITED STATES PATENT OFFICE.

JOHN B. COWPER, OF BAYONNE, NEW JERSEY.

OIL-BURNER.

1,029,048.

Specification of Letters Patent.

Patented June 11, 1912.

Application filed March 28, 1911. Serial No. 617,365.

To all whom it may concern:

Be it known that I, JOHN B. COWPER, a citizen of the United States, residing at Bayonne, in the county of Hudson and State of New Jersey; have invented new and useful Improvements in Oil-Burners, of which the following is a specification.

My invention relates to oil burners and particularly to that class of burners in which the heavier hydrocarbon oils are used and burned in the form of a spray consisting of an admixture of the oil with a suitable gaseous material, such, for example, as steam or air under pressure.

The general object of the invention is to improve the construction and operation of such burners with a view to-economy and simplicity of construction, complete atomization, ease of assemblage, dismantling and renewal of parts, and general effectiveness.

A particular object of the invention is to provide a burner of this class in which the complete admixture of the oil and air or steam or both, is absolutely assured and the escape of either from the nozzle as a separate unmixed element is absolutely prevented.

With these and other objects in view, the invention consists in the improved construction, arrangement and combination of the parts of a burner of this class which will be hereinafter fully described, the particular points of novelty being specifically set forth in the subjoined claims.

I have illustrated a preferred embodiment of my invention in the accompanying drawings in which—

Figure 1 represents the complete burner in side elevation, Fig. 2 represents the same in central, vertical, longitudinal section, Fig. 3 represents the burner in end elevation, Fig. 4 represents the oil pipe and spraying nozzle, in side elevation, removed from the casing, Fig. 5 represents a sectional view on the plane indicated by the broken line 5—5 of Fig. 4, and Fig. 6 represents a view similar to that of Fig. 5, the plane being indicated by the broken line 6—6 of Fig. 4.

Like reference characters mark the same parts wherever they occur in the various figures of the drawings.

Referring specifically to the drawings 10 indicates the main body or casing of the burner which is of any ordinary or approved construction and to which is removably secured a nozzle 11, the inner end of

the nozzle being preferably reduced and provided with exterior threads on its reduced inner end to engage interior threads in the casing, although this connection might be made in any other approved manner, or the casing and nozzle might be integral although this would be disadvantageous for the purposes of the burner.

At the inner end of the casing 10 there is secured in any approved manner, preferably by threading it on the end of the casing, a T pipe-fitting 12 into the lateral branch 13 of which is threaded a sleeve 14 receiving in its turn a second threaded sleeve 15 which in turn receives the end of a pipe 16 for the supply of suitable gaseous material, as steam or air under pressure from any suitable source. The air may be superheated if desired. The inner branch 17 of the fitting 12 is threaded on the casing 10, as before mentioned, while the outer branch 18 which is in alinement with the inner branch 17, and is of slightly less interior diameter, is interiorly threaded to receive a threaded sleeve 19 which in turn receives a second threaded sleeve 20, inside of which is threaded a pipe 21 through which oil, from any approved source, is led to the burner.

In the interior of the nozzle 11 is fitted a frusto-conical block 22 which forms the sprayer, as will be later described. This sprayer-block is recessed centrally in its inner end, as at 23, and the walls of said recess are threaded to receive the inner end of the oil pipe 21. This pipe does not reach the inner end of the recess but leaves the inner portion unoccupied to provide a chamber, as 24. The sprayer-block 22 snugly fits in the interior of the nozzle and has, formed in its outer surface, a series of spiral grooves 25 extending from end to end of the block terminating outwardly at the discharge end as clearly shown in Figs. 2, 3 and 4. From the bottom of each of the spiral grooves 25 a radial bore, as at 26, extends into the inner chamber 24 and the bottoms of the spiral grooves, from their inner ends to the bores 26 are smooth as at 27, while from these bores to their outer extremities, they are transversely serrated, toothed, cross-ribbed or grooved, or otherwise roughened as shown at 28. The spiral grooves are of comparatively short pitch, being given preferably a complete turn from one end to the other of the block.

In the operation of the block, the oil passes in through the pipe 21 to the chamber 24 and being under gravity or other suitable pressure, it is evenly distributed through the radial bores 26 into the grooves 25, each receiving an individual supply unaffected by the supply to the other grooves. Coincident with the entry of the oil into the grooves 25, the air, or steam, under pressure from pipe 16, enters the inner ends of the grooves 25 and passes rapidly through them, commingling with and thoroughly atomizing the oil and forcing the atomized oil out at the extremity of the nozzle to be burned.

The passage of the steam or air into the grooves 25 is unimpeded until the bores 26 are reached owing to the smooth finish of the walls of the grooves at these points but when the mixture of the steam or air with the oil begins at these points, the oil is forced rapidly over the transversely serrated or otherwise roughened walls of the grooves and is thus effectually and thoroughly intermixed, broken up, and atomized before it reaches the exit.

The comparatively short pitch of the spiral grooves assures a spiral movement to the commingled oil and steam or air and causes it to be discharged in a swirl thus spreading it so as to more effectually provide for its proper combustion. The snug fit of the sprayer block in the nozzle assures also an individual supply of air or steam to each groove entirely independent of any other groove and thus facilitates the proper operation of the burner.

The pipe fittings may be of ordinary construction, as well as the threaded sleeves, the uses of which will be readily understood at a glance, one of the principal functions being to assure the perfect seating of the sprayer block in the nozzle, and many variations may be made from the specific constructions shown and described, without departing from the spirit and scope of the invention.

Having thus fully described my invention, what I claim as new is—

1. A burner of the character described comprising a nozzle, a sprayer-block snugly fitted into the interior of the nozzle having an oil channel, and provided with spiral grooves in its outer surface, and means for providing each groove with an individual, independent supply of oil intermediate of its ends and from the channel.

2. A burner of the character described comprising a nozzle, a sprayer-block snugly fitted into the interior of the nozzle having an oil channel, and provided with continuous spiral grooves in its outer surface, means for providing each groove with an individual, independent supply of oil intermediate of its ends and from the channel, and means for providing each groove also with a supply of gaseous material.

3. A burner of the character described, comprising a nozzle, an elongated frusto-conical sprayer block snugly fitted into the interior of the nozzle and provided with continuous spiral grooves, in its outer surface, said sprayer block also having an interior chamber and radial bores communicating independently between the chamber and each groove at a point intermediate the ends of the latter.

4. A burner of the character described, comprising a nozzle and a sprayer block snugly fitted into the nozzle, one of said parts having its surface provided with a plurality of separated grooves each of which extends spirally around the block, said block having a chamber and being provided with conduits through which the chamber has communication with the spiral grooves intermediate of the ends of the latter, the burner also having means whereby liquid fuel and a gaseous material are delivered to the chamber and the inner ends of the spiral grooves, respectively.

5. A burner of the character described, comprising a nozzle, a sprayer block of gradually decreasing diameter from its rear to its forward end, snugly fitted in said nozzle and formed exteriorly with a plurality of separated grooves each of which extends spirally around the same from the rear end to the front end thereof, the burner also having means through which gaseous material is supplied to the rear end of each of the grooves and means through which the interior of the block is supplied with liquid fuel, and said block having bores through which the liquid-fuel is delivered to the grooves intermediate of the ends of the latter.

6. A burner of the character described comprising a nozzle, a sprayer-block snugly fitted into the interior of the nozzle, and provided with spiral grooves in its outer surface, the walls of the grooves being roughened.

7. A burner of the character described comprising a nozzle, a sprayer-block snugly fitted into the nozzle having spiral grooves in its outer surface and provided with an oil channel, and means for supplying each groove independently from said channel with a supply of oil at points intermediate its ends, each groove having its walls roughened.

8. A burner of the character described comprising a nozzle, a sprayer-block snugly fitted into the interior of the nozzle and provided with spiral grooves in its outer surface and with bores leading to said grooves, the walls of the grooves being roughened from said bores to their outer ends.

9. A burner of the character described, comprising a nozzle and a sprayer block snugly fitted into the nozzle, one of said

parts having its surface provided with a plurality of separated grooves each of which extends spirally around the block, said burner also having a channel and the block
5 having separated bores through which the channel has communication with the spiral grooves intermediate of the ends of the latter, the walls of said grooves being roughened from the outer ends of the bores to
10 the discharge ends of the grooves and smooth from said outlet ends of the bores to the entrance ends of the grooves, and means through which fuel and a gaseous material are delivered to said channel and the en-
15 trance ends of the grooves, respectively.

10. A burner of the character described, comprising a nozzle, a frusto-conical sprayer-block snugly fitted into the inte-

rior of the nozzle, and provided exteriorly with spiral grooves which extend from end to end thereof and with bores having out- 20
lets which open into said grooves intermediate of the ends of the latter, the walls of the grooves being roughened from said bores to their outer ends and smooth from said 25
bores to their inner ends, and means for delivering fuel to the inlet ends of the bores and a gaseous medium to the entrance ends of the grooves, respectively.

In testimony whereof I have hereunto 30
set my hand in presence of two subscribing witnesses.

JOHN B. COWPER.

Witnesses:

CHAS. E. ANNETT,
BERTRAM CUBBERLING.