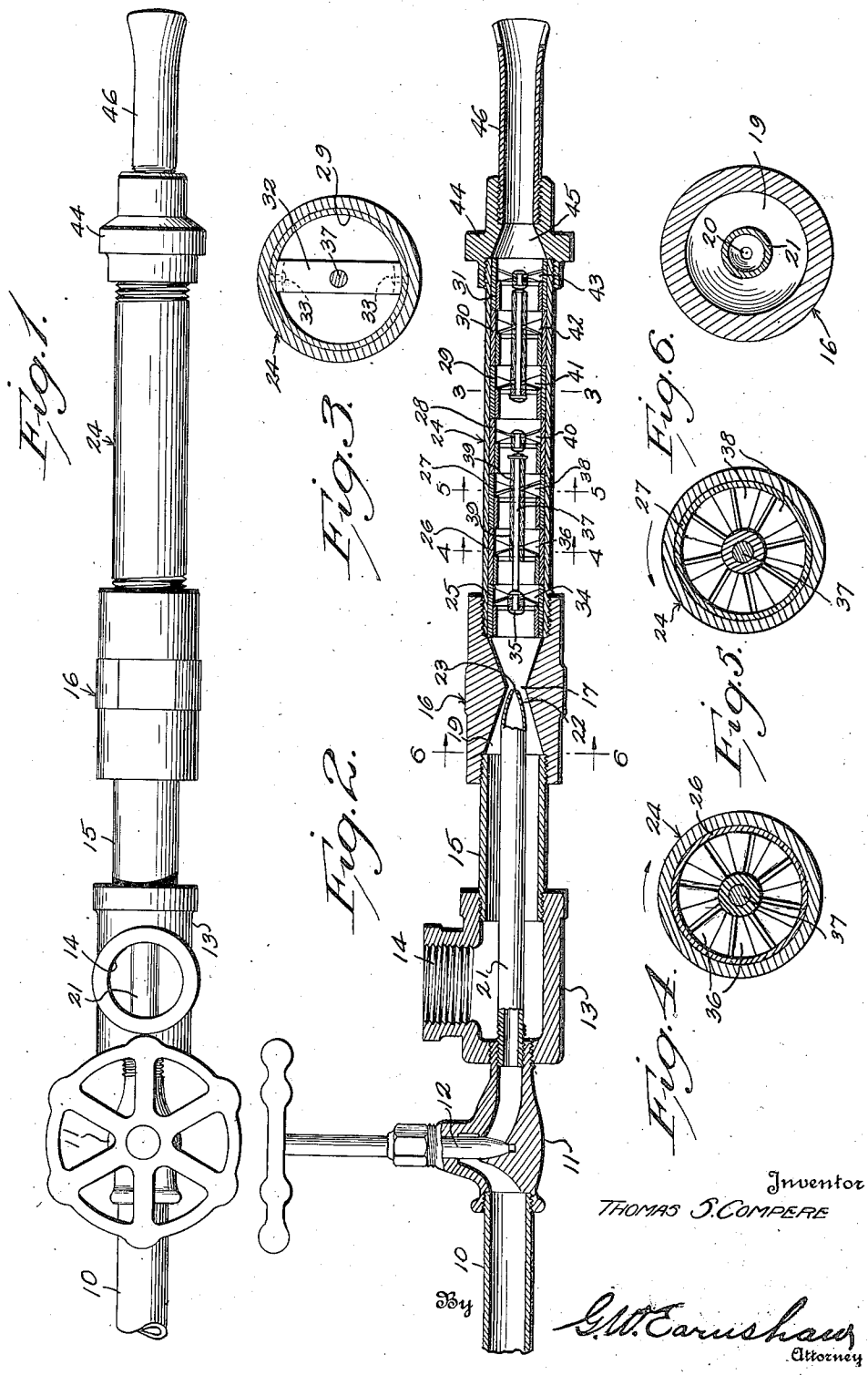
Aug. 5, 1924. 1,503,817

T. S. COMPERE

OIL BURNER

Filed July 14, 1922



Inventor
THOMAS S. COMPERE

By G. W. Earnshaw
Attorney

Patented Aug. 5, 1924. 1,503,817

UNITED STATES PATENT OFFICE.

THOMAS S. COMPERE, OF JOPLIN, MISSOURI.

OIL BURNER.

Application filed July 14, 1922. Serial No. 575,080.

To all whom it may concern:

Be it known that I, THOMAS S. COMPERE, a citizen of the United States, residing at Joplin, in the county of Jasper and State of Missouri, have invented certain new and useful Improvements in Oil Burners, of which the following is a specification.

This invention relates to oil burners and more particularly to such a device wherein the fuel is mixed with the combustion supporting fluid within the burner casing and delivered to the burner nozzle for combustion.

An object of the invention is the provision of an efficient mixing device wherein the fuel is intermittently mixed with the combustion supporting fluid and immediately expanded to assist in vaporizing the fuel.

A further object of the invention is the provision of agitating units adapted to thoroughly agitate the mixture immediately after expansion thereof to continue the vaporization begun by expansion of the mixture.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings I have shown one embodiment of the invention. In this showing,

Figure 1 is a plan view of the device,

Figure 2 is a central vertical longitudinal sectional view,

Figure 3 is a section taken on line 3—3 of Figure 2,

Figure 4 is a similar view taken on line 4—4 of Figure 2,

Figure 5 is a similar view taken on line 5—5 of Figure 2, and,

Figure 6 is a similar view taken on line 6—6 of Figure 2.

Referring to the drawings, the numeral 10 designates a feed pipe connected with a suitable source of fuel oil supply. The pipe 10 is connected with any preferred type of cut-off valve casing 11 having a valve 12 arranged therein. The opposite end of the valve casing 11 is screw-threaded and received in a screw-threaded opening in a T-coupling 13. The coupling 13 is provided with a screw-threaded opening 14 adapted for connection with a pipe leading to a source of combustion supporting fluid under pressure such as compressed air or steam. The end of the coupling 13 opposite its connection with the valve casing 11 is provided with a screw-threaded opening adapted to receive the screw-threaded end of a sleeve 15, the opposite end of which is threaded for connection with a mixing chamber designated as a whole by the reference numeral 16.

As shown in Figure 2, the mixing chamber 16 is preferably cylindrical in form and is provided with a polygonal portion adapted for use with a wrench for applying the casing to the sleeve 15. Substantially centrally of its length the chamber 16 is provided with a restricted opening 17 for a purpose to be described. The inside of the chamber 16 tapers outwardly toward the ends of the casing forming conical bores 19 and 20. The portion 19 as shown communicates with the interior of the sleeve 15.

As shown in Figure 2 the outer end of the valve casing 11 is internally screw-threaded for connection with one end of an oil supply pipe 21. This pipe extends through the coupling 13 and sleeve 15 and terminates in a tapered end 22 having a restricted opening 23 therein. The outer end 22 of the pipe 21 terminates adjacent the restricted opening 17 of the chamber 16.

The numeral 24 designates as a whole an agitating chamber comprising a cylindrical sleeve threaded at its inner end for connection with the outer end of the chamber 16. A plurality of sleeves designated by the reference characters 25 to 31 inclusive are arranged in end to end relation within the chamber 24, fitting snugly therein. As shown in Figures 2 and 3, each of the sleeves is provided with a bracket 32 secured to the corresponding sleeve by rivets 33 or the like. The sleeve 25 is provided with a fan 34 rigidly secured to its corresponding bracket 32 by a rivet 35 so as to be stationary therewith. The sleeve 26 is provided with a fan 36 rotatably mounted upon a stem 37 extending through the brackets 32 of the sleeves 26 and 27. The sleeve 27 is provided with a fan 38 also mounted upon the stem 37 and the fans 36 and 38 are maintained in proper spaced relation by spacing collars 39. The blades of the fans 36 and 38 are pitched in opposite directions so that one will rotate to the right and the other to the left under the impulse of the combustible fluid passing through the chamber 24. The sleeve 28 is provided with a stationary fan 40 similar to the fan 34 while the sleeves

29 and 30 are provided with fans 41 and 42 which are identical in arrangement and operation respectively to the fans 38 and 40. The sleeve 31 is also provided with a stationary fan 43 similar to the fans 34 and 40.

A coupling 44 is provided having an internally threaded inner end adapted for connection with the externally threaded outer end of the sleeve 24. The coupling 44 is provided with a conical opening communicating with the interior of the sleeve 24 and this opening decreases in diameter toward its outer end. The outer end of the coupling 44 is internally threaded for connection with a burner nozzle 46. It will be obvious that the burner 46 is removable and that any type of burner nozzle desired may be threaded into the outer end of the coupling 44.

The operation of the device is as follows: The pipe 10 is connected with any suitable source of fuel supply such as either high or low grade fuel oil or oil distillate, the device being adapted to efficiently burn either of these materials. When the valve 12 is open oil flows through the valve casing 11 and pipe 21 passing out of the latter through the restricted opening 23 in the form of a spray. As stated the opening 14 is connected with a suitable source of combustion supporting fluid such as compressed air or steam. When the device is in operation the steam or the like passes through the coupling 13 and sleeve 15 and into the opening 19 of the mixing chamber 16. It will be apparent that the restricted opening 17 and the restricted space surrounding the outer end of the pipe 21 causes the steam to pass the opening 23 at a high velocity drawing oil from the pipe 21 in the form of a spray as stated. The opening 20 acts as a venturi permitting the rapid expansion of the commingled atomized fuel and steam, so that the fuel is largely vaporized. Immediately after this expansion the combustible fluid passes through the fan 34 causing it to revolve in one direction within the casing 24. The mixture then passes through the fan 34 causing the latter to revolve in one direction and then passes on through the fans 38, 40, 41, 42 and 43. The various actions of the stationary fans and those revolving in opposite directions serve to continuously agitate the fuel after it passes through the opening 20 and until it reaches the burner nozzle 46. It has been found that the arrangement of the stationary and rotating fans serves to efficiently mix and vaporize the fuel so that a high heat is obtained at the burner nozzle. The device may be employed efficiently in furnaces for heating buildings and in foundries, ovens, or locomotives or may be put to any similar use wherein intense heat is desired.

It is to be understood that the form of my invention herewith shown and described is to be taken as a preferred example of the same, and that various changes in the shape, size, and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

What I claim is:

1. An oil burner comprising an oil supply pipe, a mixing chamber provided with a restricted opening intermediate its ends, said oil supply pipe having a restricted open end arranged in the restricted opening of said mixing chamber and spaced from the walls thereof, means for supplying a combustion supporting fluid to said chamber at the inner end thereof, said chamber tapering to an enlarged outer end, an agitating chamber connected at one end with the outer end of said mixing chamber, an agitating fan mounted in said agitating chamber, and a burner nozzle connected with the opposite end of said agitating chamber.

2. An oil burner comprising a mixing chamber having an opening extending entirely therethrough and tapered to form a restricted opening intermediate the ends of the chamber, an oil supply pipe having a restricted open end arranged in the restricted opening of said mixing chamber and spaced from the walls thereof, means for supplying a combustion supporting fluid to said chamber at the inner end of the opening therein, an agitating chamber connected at the opposite end of said opening, an agitating fan mounted in said agitating chamber adjacent the outer end of the opening in said mixing chamber, and a burner nozzle connected with said agitating chamber.

3. An oil burner comprising a mixing chamber having an opening extending therethrough and tapered from opposite ends to form a restricted opening intermediate the ends of the chamber, an oil supply pipe having an atomizing nozzle arranged within said restricted opening and spaced from the walls thereof, a sleeve surrounding said oil pipe and communicating with the inner end of the opening in said mixing chamber, means for supplying a combustion supporting fluid to said sleeve, an agitating chamber connected at the opposite end of the opening in said mixing chamber, a pair of revolving fans mounted in said agitating chamber, said fans being adapted to rotate in opposite directions, and a burner nozzle connected with said agitating chamber.

4. An oil burner comprising a mixing chamber having an opening extending therethrough and tapered from opposite ends to form a restricted opening intermediate the ends of the chamber, an oil

supply pipe terminating at one end in a tapered atomizing nozzle arranged within said restricted opening and spaced from the walls thereof, a sleeve surrounding and spaced from said oil pipe and communicating with the inner end of the opening in said mixing chamber, means for supplying a combustion supporting fluid to said sleeve, an agitating chamber connected at the opposite end of the opening in said mixing chamber, a stationary fan mounted in said agitating chamber adjacent the outer end of the opening in said mixing chamber, a pair of fans mounted in said agitating chamber adjacent said stationary fan, said last named fans being adapted to rotate in opposite directions, and a burner nozzle connected with said agitating chamber.

5. An oil burner comprising a mixing chamber having an opening extending therethrough and tapered from opposite ends to form a restricted opening intermediate the ends of the chamber, an oil supply pipe terminating at one end in a tapered atomizing nozzle arranged in said restricted opening and spaced from the walls thereof, a sleeve surrounding and spaced from said oil pipe, and communicating with the inner end of the opening in said mixing chamber, means for supplying a combustion supporting fluid to said sleeve, an agitating chamber connected at the opposite end of the opening in said mixing chamber, a sleeve mounted in said agitating chamber adjacent the outer end of the opening in said mixing chamber, a stationary fan mounted in said last named sleeve, a pair of sleeves mounted in said agitating chamber adjacent said last named sleeve, fans mounted in said sleeves, said last named fans being adapted to rotate in opposite directions, and a burner nozzle connected with said agitating chamber.

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

THOMAS S. COMPERE.

Witnesses:
R. C. EARNSHAW,
H. J. KRUGG.