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E. B. SHAW & M. T. CARROLL.

INJECTOR BURNER.

APPLICATION FILED JULY 26, 1902.

NO MODEL.

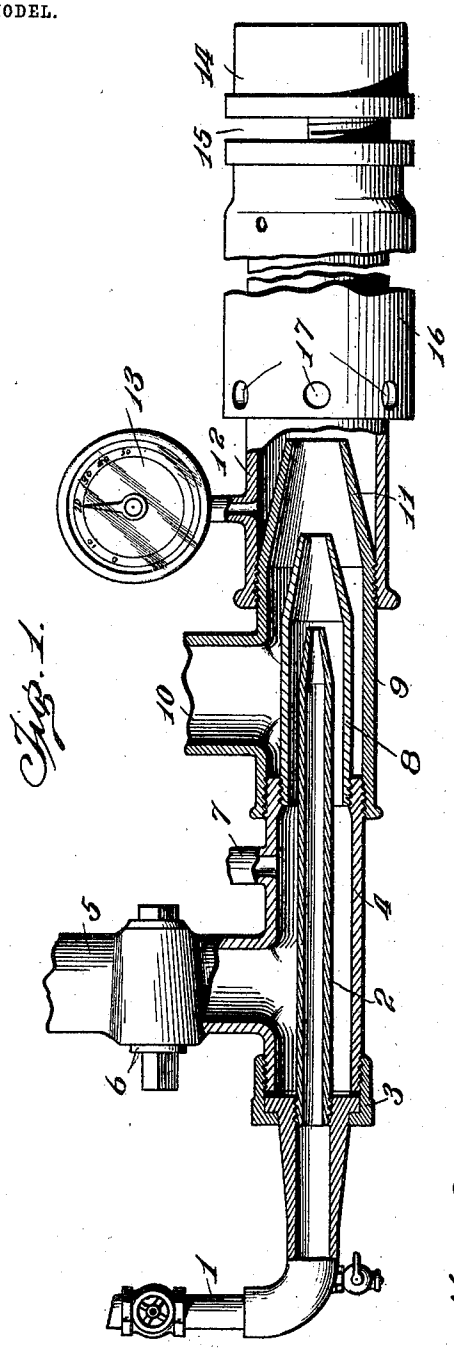


Fig. 1.

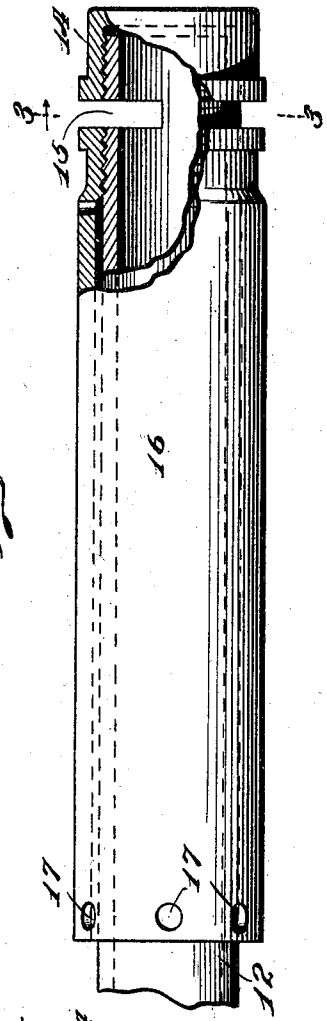


Fig. 2.

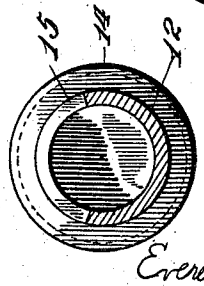


Fig. 3.

Witnesses
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UNITED STATES PATENT OFFICE.

EVERETT B. SHAW AND MARTIN T. CARROLL, OF KANE, PENNSYLVANIA.

INJECTOR-BURNER.

SPECIFICATION forming part of Letters Patent No. 719,382, dated January 27, 1903.

Application filed July 26, 1902. Serial No. 117,151. (No model.)

To all whom it may concern:

Be it known that we, EVERETT B. SHAW and MARTIN T. CARROLL, citizens of the United States, residing at Kane, in the county of McKean and State of Pennsylvania, have invented certain new and useful Improvements in Injector-Burners; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to improvements in injector-burners, and particularly to such as are provided with means for mixing a plurality of fuels and also with means for controlling the supply of fuel being consumed.

The object in view is the utilization of steam as a driving medium for forcing several fuels to the point of combustion.

A further object is the provision of means for controlling the degree of heat produced by the burner.

With these and other objects in view the invention consists of a plurality of nested nozzles, means for supplying air and a fluid fuel to one of said nozzles, means for supplying a fuel to another of said nozzles, and means for supplying steam to the nozzle in the rear of said fuel-nozzles.

It further consists, in combination with a suitable mixer, of a tube having its end closed and a transverse slot cut in its side wall, and a sleeve surrounding said tube and adapted to be passed over said slot.

It also consists in certain other novel constructions, combinations, and arrangements of parts, as will be hereinafter fully described and claimed.

In the accompanying drawings, Figure 1 represents a view in side elevation of an injector-burner embodying the features of the present invention, parts being shown in section for disclosing the interior structure. Fig. 2 represents a similar view of the pressure-regulating sleeve and surrounding parts. Fig. 3 represents a transverse section taken on the line 3 3 of Fig. 2.

In the employment of hydrocarbon and other fluid fuels it has been found desirable, owing to the inferiority of one fuel employed, to use a plurality of different fuels in order that the necessary pressure may be maintained, and in order to control such pressure various forms of valves have been employed with varying degrees of success. However, by a series of careful experiments we have ascertained that good results can be secured by the particular structure disclosed in the accompanying drawings, in which—

1 indicates a suitable steam-supply pipe, into the end of which is threaded or otherwise suitably secured a nozzle 2. The end of the pipe 1 is preferably detachably secured by means of a coupling 3 to the rear end of a tube 4. An air-supply duct 5, controlled by a suitable plug 6, discharges into the tube 4, and a preferably comparatively small tube 7 leads into tube 4 for supplying oil thereto. A nozzle 8 has its rear end secured to the front end of tube 4 and surrounds the nozzle 2, the discharge end of the nozzle 8 extending beyond the corresponding end of nozzle 2. Surrounding nozzle 8 and suitably secured to the front end of tube 4 is a pipe 9, having a suitable gas-supply 10, communicating therewith and formed on its front end with a suitable discharge-nozzle 11, surrounding nozzle 8 and extending in front of the same. A tube 12 is attached to the front end of pipe 9 and carries any suitable pressure-gage 13. The tube 12 may be of any preferred length and is adapted to be passed into the combustion-chamber of a furnace. The front end of tube 12 is threaded and provided with a closing-cap 14. A transverse slot 15 is cut through the side wall of tube 12, and a suitable sleeve 16 surrounds said tube and has its front end engaging the threads of the forward end of the tube. The rear end of sleeve 16 is provided with apertures 17 17 or any other suitable means for receiving an operating-tool.

In operation steam is supplied through nozzle 2, the discharge of which causes a suction of air through duct 5 and oil through tube 7, said elements being partially mixed within the tube 4 and then being brought into contact with the steam being discharged from nozzle 2. The further discharge of the steam will drive before it the mixed air and oil through nozzle 8, thereby drawing in a suitable supply of gas through pipe 10, which with the mixed oil, air, and steam will be

driven through nozzle 11 and along tube 12 until it strikes the cap 14. The mixed products will now be discharged through slot 15 and may be ignited. The gage 13 will indicate the pressure of the fuel being burned, and such pressure may be controlled by rotation of sleeve 16, whereby the width of slot 15 may be readily increased or decreased.

Although we have specifically set forth one particular embodiment of the present invention, yet it will be understood that we do not desire to limit ourselves to the minor details of structure, but shall take the liberty to deviate therefrom to any degree within the spirit and scope of the present invention.

Having now described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a device of the class described, the combination with a suitable fuel-supply, of a tube communicating therewith having its free end threaded and provided with a slot, a cap surrounding the end of said tube and extending to the plane of one edge of said slot, and a sleeve surrounding said tube, and engaging the threads thereof and extending to the plane of the opposite edge of the slot, substantially as described.

2. A device of the class described, comprising a pressure-supply pipe, a nozzle carried thereby, a tube surrounding said nozzle, means supplying air to said tube, means supplying oil to said tube, a nozzle carried by said tube inclosing the forward end of the pressure-supply nozzle, a pipe surrounding said air and oil nozzle, provided with a nozzle inclosing a part of said last-mentioned nozzle, and a gas-supply for said last-mentioned pipe, substantially as described.

3. In a device of the class described, the combination with a suitable fuel-supply, of a tube communicating therewith, a slot formed in the wall of said tube, a sleeve threaded onto said tube and adapted to be moved across the slot, and annular abutting means on said tube on the opposite side of said sleeve, substantially as described.

4. In a device of the class described, the combination with a suitable fuel-supply, of a tube communicating therewith, a cap closing said tube and forming an abutment, a transverse slot being cut in the said tube and having its edge in line with the abutment, and a sleeve threaded onto said tube and moving longitudinally thereof, and having its end extending in the horizontal plane of said abutment, the end of the sleeve forming an annular abutment, substantially as described.

5. In a device of the class described, the combination with a suitable fuel-supply tube having its free end threaded and provided with a transverse slot, a cap threaded onto said end and forming an abutment, and a sleeve surrounding said tube and engaging the threads at the end thereof opposite said abutment, substantially as described.

In testimony whereof we hereunto affix our signatures in presence of two witnesses.

EVERETT B. SHAW.
MARTIN T. CARROLL.

Witnesses:
J. G. MONTGOMERY,
C. B. GILLIS.