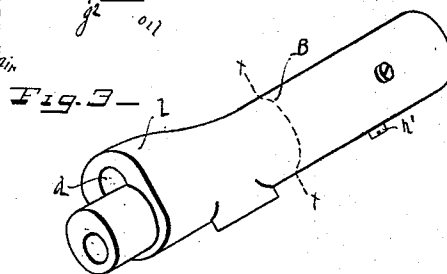
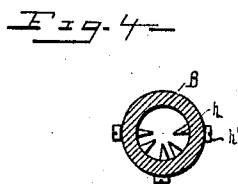
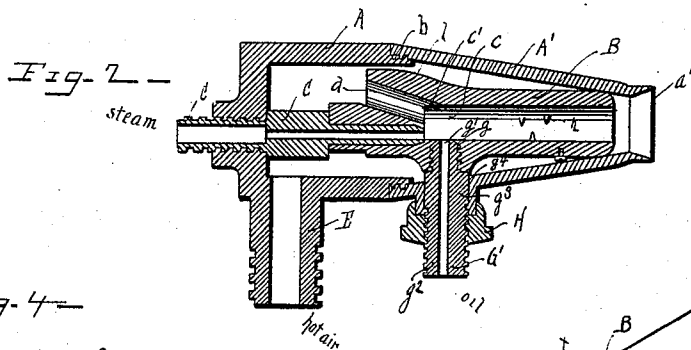
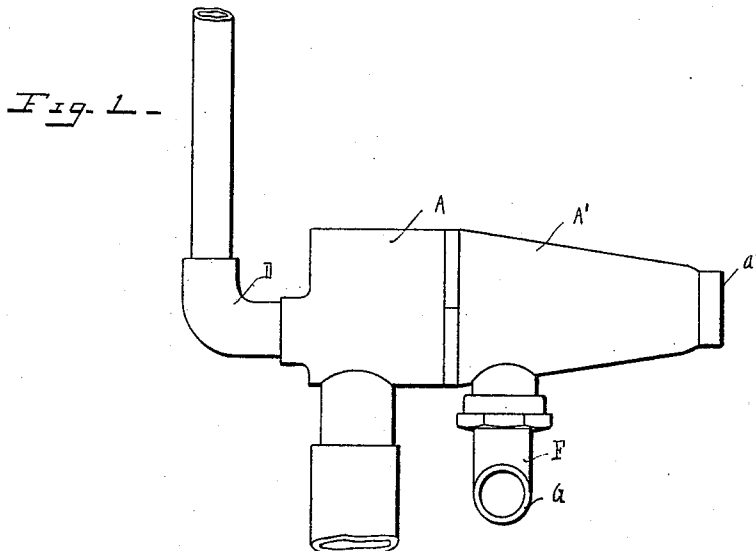


(No Model.)

F. M. REED.
HYDROCARBON INJECTOR BURNER.

No. 518,897.

Patented Apr. 24, 1894.



WITNESSES

Geo. Anderson
Phillips

INVENTOR

F. M. Reed
by *E. W. Anderson*
his Attorney

UNITED STATES PATENT OFFICE.

FRANKLIN M. REED, OF ANDERSON, INDIANA, ASSIGNOR OF THREE-FOURTHS
TO CHARLES E. JONES, WILLIAM A. JONES, AND WILLIAM H. ZIEGLER,
OF SAME PLACE.

HYDROCARBON INJECTOR BURNER.

SPECIFICATION forming part of Letters Patent No. 518,897, dated April 24, 1894.

Application filed June 30, 1893. Serial No. 479,236. (No model.)

To all whom it may concern:

Be it known that I, FRANKLIN M. REED, a citizen of the United States, and a resident of Anderson, in the county of Madison and State of Indiana, have invented certain new and useful Improvements in Hydrocarbon Injector Burners; and I do 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, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

Figure 1 of the drawings is a side elevation of the shell with connections partly broken away. Fig. 2 is a vertical section of same. Fig. 3 is a detail view of the mixer, and Fig. 4 is a transverse section of the same taken on line *x x*.

This invention has relation to certain new and useful improvements in hydrocarbon injector burners, wherein the hydrocarbon in the form of oil is thoroughly atomized or broken up, and mixed with heated air, by the action of a jet of steam brought in contact therewith in an atomizing or mixing chamber, the mixture being carried by the jet to the point of combustion within a fire box or furnace, where it is ignited, and the flame projected with great velocity along and around the surfaces to be heated.

The object I have in view is to improve the construction and arrangement of the mixing chamber and burner, and the invention consists in the novel construction and combination of parts, all as hereinafter described and pointed out in the claims.

Referring to the accompanying drawings, the letter A designates the shell of the burner, having a tapering conical nozzle portion discharging at *a'*. Said shell is made in two parts having a threaded connection *b*, in order to facilitate the insertion of the atomizer or mixer therein.

B designates the atomizer or mixer, which consists of a short piece of tube, having a longitudinal passage *c* therethrough, said passage being joined at *c'* by an oblique passage

or opening *d*, entering said tube through the flange *l* thereon. The inner end of the passage *c* receives the discharge portion or nozzle of a jet pipe C, which has a threaded seat in the end portion of the shell A, and is provided at its outer projecting end with a coupling D, for connection with a steam pipe from the boiler, or other supply.

At E the shell is provided with a hollow threaded connection for a hot air pipe from the furnace or other point, the air from said pipe entering the shell at the end portion farthest from the discharge.

F designates the oil supply pipe, which is led from an elevated reservoir or tank, and enters the shell at the under side by means of the coupling and the nozzle G', the reduced threaded inner end portion *g* of which engages a threaded aperture *g'* in the mixer, opening into the passage *c*, about midway of the length of the latter. Between the inner threaded portion *g* of the nozzle G', and an outer threaded portion *g*² thereof to which is attached the coupling G is an unthreaded portion *g*³, which fits snugly in the opening *g*⁴ in the shell. Between the said unthreaded portion *g*³ and the outer threaded portion *g*² is a screw nut H.

Within the passage *c* of the mixer in front of the point where the oil enters, are a series of points or projections *h*. The jet of steam from the pipe C entering the passage *c*, causes a suction which draws the hot air into the chamber of the shell from the pipe E, and this heated air entering the passage *c* through the opening *d*, mingles with the steam and strikes the oil from the nozzle G' with great velocity, breaking it up and mixing it with the air and steam, with which it is carried forward. The points or projections *h* in the passage *c*, serve to still further break up the oil and mix it with the steam and hot air. The mixture is discharged from the nozzle *a'* of the shell, and ignites with an intense combustion, the jet serving to carry the flames to a greater or less distance within the furnace or fire box, according to the quantity and velocity of the steam admitted.

The discharge of the nozzle G' is designed

to be of comparatively small area, and the oil by reason of its upward flow through said nozzle, is designed to be delivered with an even feed.

- 5 The discharge end of the atomizer or mixer may be held centrally within the shell by means of the projections *h'* thereon.

Having thus described my invention, what I claim as new, and desire to secure by Letters

10 Patent, is—

1. In an injector burner, the combination of the shell A having a tapering nozzle portion, the atomizer B consisting of a short tube having a longitudinal passage *c* therethrough, 15 and supported in the forward portion of the chamber of said shell, a flange *l* on the rear end portion of said atomizer, an oblique passage *d* through said flange and joining the passage *c*, a jet pipe C entering the rear end 20 of said passage *c* and having a threaded seat at its opposite end portion in the rear wall of said shell, a hot air supply pipe opening into the rear portion of the shell chamber, and an oil supply pipe extending up through the 25 lower wall of the said shell, and through the lower wall of the atomizer into the passage *c*

forward of the point where said passage is joined by the passage *d'*.

2. In an injector burner, the combination of the shell A, the atomizer B supported in 30 the forward portion of said shell, a passage *c* through said atomizer, an oblique passage *d* leading from the interior of the shell and joining the passage *c*, the projections *h* in said passage, the jet pipe entering the passage *c* 35 at one end, the hot air pipe opening into the rear portion of the shell, the oil supply pipe entering said shell and atomizer at the under side, its nozzle *G'* having a reduced thread- 40 ed portion *g* which engages the atomizer, a threaded portion *g'*, the coupling G attached thereto, the unthreaded portion *g''* fitting an opening in the shell, and the nut H between said portions *g'* and *g''*, substantially as speci- 45 fied.

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

FRANKLIN M. REED.

Witnesses:

SAMUEL P. MOORE,
WILLIAM J. DOVE.