Sept. 22, 1942. A. E. MARTOIS 2,296,475

GAS BURNER

Filed March 11, 1940

Fig. 2.

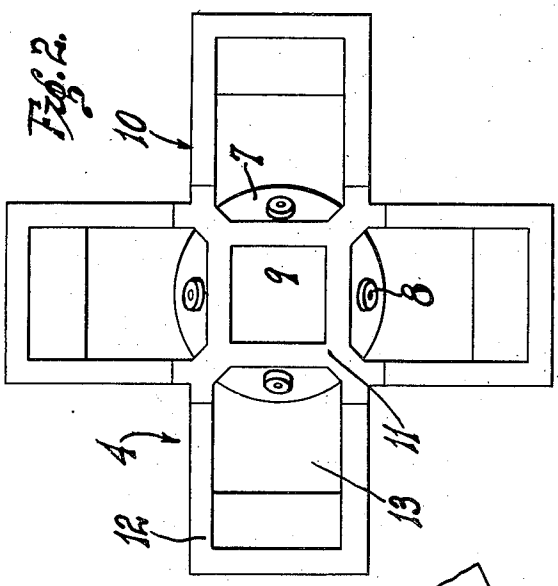


Fig. 3.

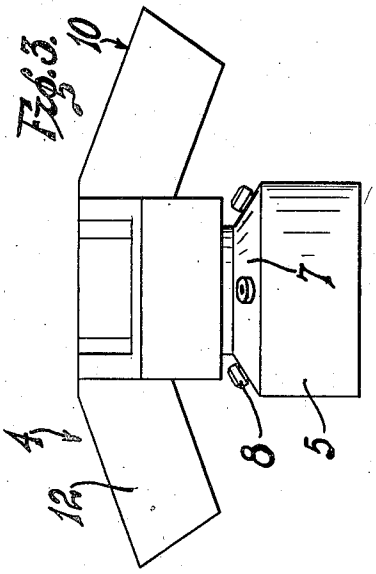


Fig. 1.

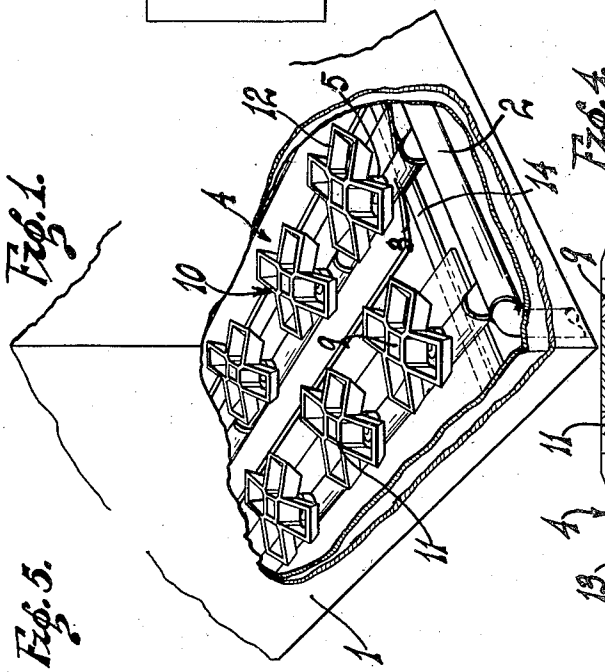


Fig. 4.

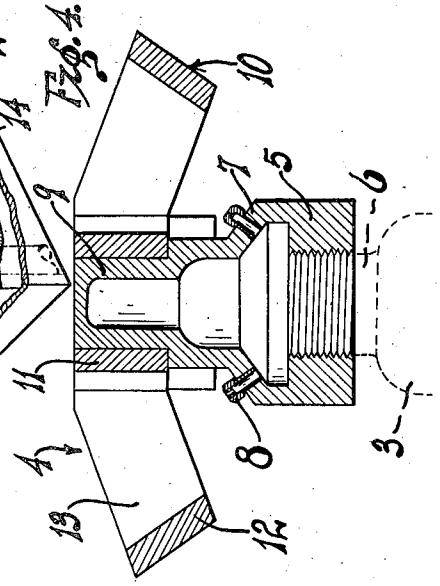
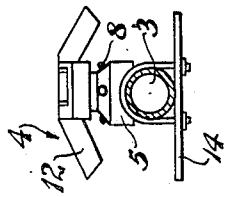


Fig. 5.



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GAS BURNER

Arthur E. Martois, Torrance, Calif.

Application March 11, 1940, Serial No. 323,319

5 Claims. (Cl. 158—106)

This invention relates to an improvement in gas burners which are used in oil field boilers which are usually of the portable type. Under present operating methods in the oil fields, it is the practice to combine various pieces of drilling machinery into compact units, which are transported from one location to another without dismantling. My improved burner is in line with the present oil field practices since it is so designed, arranged and constructed that it can be supported within the fire box of the boiler, and the boiler and burner assembly can be moved as one unit.

An object of my invention is to provide a novel gas burner having a large number of individual gas discharge orifices and mixing chambers or tubes.

Another object of my invention is to provide a novel gas burner in which several jets of gas and air mixture impinge or contact one another, thus more intimately mixing the fuel which causes a quicker and more complete combustion.

A feature of my invention resides in the short mixing tubes which are open from end to end and are not restricted by baffles or other obstructions. The gas comes out of the jets at an angle, and thence into the tubes, and several jets meet one another, which tends to break and reduce the force of the gas issuing from the jets.

Another feature of my invention is to provide a burner riser or housing, which is light in weight and which exposes a minimum of surface to the heat of the combustion chamber.

Still another feature resides in the novel mixing tube assembly, which is a separate casting, and can be mounted or removed without the use of tools.

Another object of my invention is to provide a novel gas burner which has a relatively small over-all height, thus providing more combustion space in the firebox of the boiler. Due to the large number of individual gas jets and air mixers, my burner will operate on relative low pressure whereas burners heretofore in use require a relatively high gas pressure.

An advantage of my invention is that my burner will distribute the heat to all parts of the firebox, thus eliminating hot spots and dead zones in the combustion chamber.

Other objects, advantages and features of invention may appear from the accompanying drawing, the subjoined detailed description, and the appended claims.

In the drawing:

Figure 1 is a fragmentary, isometric view of a fire box, with parts broken away to show my burner assembly within the box.

Figure 2 is a top plan view of a burner.

Figure 3 is a side elevation of the same.

Figure 4 is a transverse, sectional view of the same.

Figure 5 is a transverse sectional view through one of the distributor pipes.

Referring more particularly to the drawing, the numeral 1 indicates the fire box of a boiler in one end of which a gas manifold 2 extends. A plurality of distributor pipes 3 extend from the manifold 2 and a plurality of burner units 4 are mounted on either of the distributor pipes. Each burner unit consists of a riser or housing 5, which screws onto a nipple 6 rising from the distributor pipe 3. The riser housing is hollow and closed at the top, substantially as shown in Figure 4. The housing is also formed with an annular inclined wall 7. A plurality of jets 8 extend through this wall and project upwardly and outwardly at an angle. The upper portion of the riser is angularly shaped, as shown at 9, and receives a mixer 10. The mixer consists of a central hub 11, which fits onto the angular part 9 thus non-rotatably holding the mixer on the riser.

A plurality of radially extending wings 12 are provided on the mixer and are preferably integrally formed with the central or hub part 11. The wings 11 are formed with mixer tubes or openings 13 in each of the wings 12, and these openings are unimpeded from top to bottom and direct the air and gas upwardly and outwardly at an angle. The various burner assemblies are so arranged in the fire box that groups of four direct the gas and air to a common point where it is further effectively mixed and agitated to effectively and quickly burn the gas. This arrangement of burner assemblies is shown in Figure 1. A number of air baffle plates 14 are rotatably mounted on the distributor pipes 3, and can be tilted for the purpose of admitting the proper amount of air for complete combustion of the gas.

It is to be noted that the bottom edge of the wings 12 are spaced above the gas outlet openings or tips 8, and this enables the ejected gas to pick up primary air before entering the openings 13—that is, the air is entrained. With applicant's arrangement, the flame can burn down to the jet or gas orifice without injury to the burner, and this action creates a pilot flame, insuring proper ignition of the gas. The wings 12 are also inclined downwardly at an angle, as

shown in Figures 3 and 4, thus providing a clear opening through which the gas and primary air passes without any baffling effect. Furthermore, this arrangement directs the flame towards the common point approximately at the center of a group of two or more burners, thus providing a more effective combustion, and without having the flame impinge upon the top sheet of the boiler.

Having described my invention, I claim:

1. A gas burner comprising a riser, an annular inclined wall on the riser, said wall having a plurality of jets extending therethrough, a polygonal hub formed at the upper end of the riser, a mixer adapted to fit on the polygonal hub and non-rotatably supported thereon, said mixer having a plurality of mixing chambers extending therethrough from top to bottom, said chambers being unimpeded from top to bottom, there being a chamber above each of the jets through which the gas and air passes upwardly and outwardly at an angle relative to the burner.

2. In a gas burner comprising a distributor pipe, a riser mounted on the distributor pipe and extending substantially perpendicular to said distributor pipe, said riser having a gas orifice extending upwardly and outwardly therefrom, a mixer mounted on the riser, said mixer having a mixing chamber extending therethrough adjacent the orifice through which a mixture of gas and air is directed upwardly and outwardly relative to the burner, and a flat air baffle plate rotatably mounted on the distributor pipe, said baffle plate extending longitudinally along the distributor pipe and being rotatable about said distributor pipe.

3. In a gas burner comprising two or more distributor pipes horizontally spaced, a plurality of spaced burners mounted on each of the distributor pipes, each burner comprising a riser each riser extending substantially perpendicular to the distributor pipe, said riser having a gas outlet orifice extending upwardly and outwardly therefrom, a polygonal hub on the upper end of the riser, a mixer adapted to fit on said hub, and non-rotatably supported thereon, said mixer having a mixing chamber extending angularly through from top to bottom, said chambers being unimpeded from top to bottom, there being a chamber above each of said outlet orifices through which a mixture of gas and air is directed upwardly and outwardly relative to each burner, the adjacent mixing chambers of the burners directing flames to a common center above and between adjacent burners.

4. In a gas burner comprising two or more distributor pipes horizontally spaced, a plurality of spaced burners mounted on each of the distributor pipes, each burner comprising a riser each riser extending substantially perpendicular to the distributor pipe, said riser having a gas outlet orifice extending upwardly and outwardly therefrom, a polygonal hub on the upper end of the riser, a mixer adapted to fit on said hub, and non-rotatably supported thereon, said mixer having a mixing chamber extending angularly through from top to bottom, said chambers being unimpeded from top to bottom, there being a chamber above each of said outlet orifices through which a mixture of gas and air is directed upwardly and outwardly relative to each burner, the adjacent mixing chambers of the burners directing flames to a common center above and between adjacent burners, and a flat air baffle plate rotatably mounted on the distributor pipes below the risers, said baffle plates extending longitudinally along the distributor pipes and rotatable about said distributor pipes.

5. A gas burner comprising a riser, a distributor pipe, said riser extending from the distributor and substantially perpendicular therefrom, an annular inclined wall on the riser, said wall having a plurality of jets extending therethrough, a polygonal hub formed at the upper end of the riser, a mixer adapted to fit on the polygonal hub and non-rotatably supported thereon, said mixer having a plurality of mixing chambers extending therethrough from top to bottom, said chambers being unimpeded from top to bottom, there being a chamber above each of the jets, through which the gas and air passes upwardly and outwardly at an angle relative to the burner, and a flat air baffle plate rotatably mounted on the distributor pipes below the risers, said baffle plates extending longitudinally along the distributor pipes and rotatable about said distributor pipes.

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