Oct. 13, 1953 F. C. NEULS 2,655,210

SHEET METAL MIXER FOR GAS BURNERS

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Fig. 1

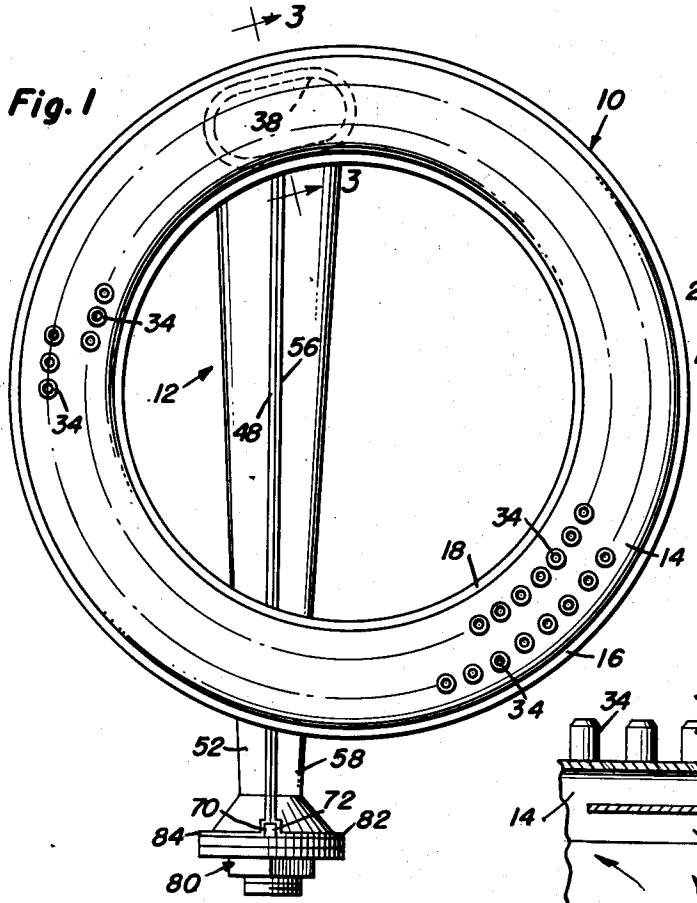


Fig. 3

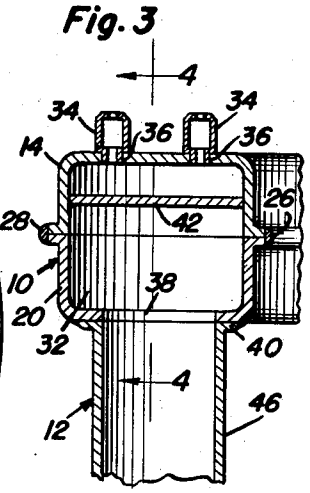
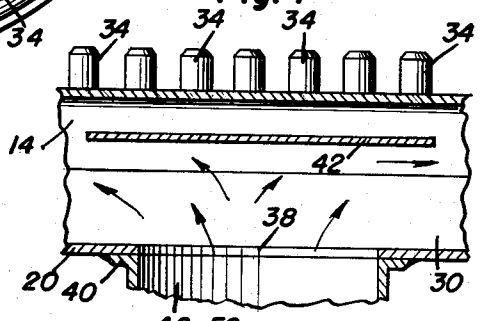


Fig. 4



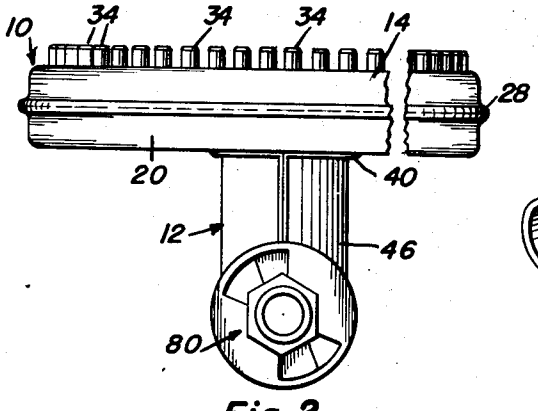


Fig. 2

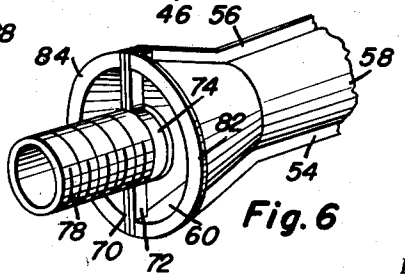


Fig. 6

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SHEET METAL MIXER FOR GAS BURNERS

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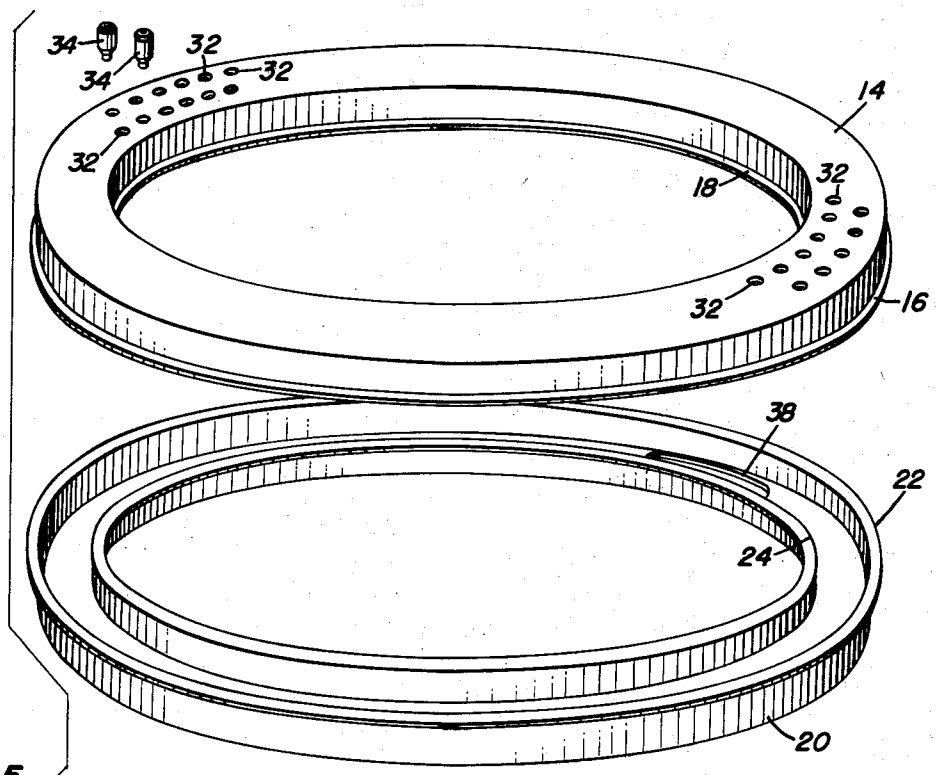
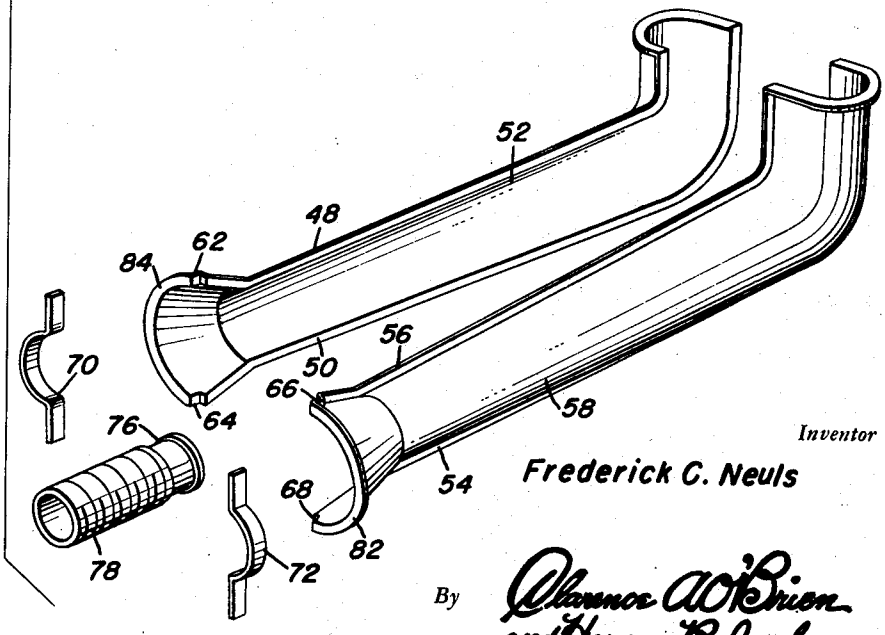


Fig.5



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SHEET METAL MIXER FOR GAS BURNERS

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Application October 4, 1950, Serial No. 188,362

3 Claims. (Cl. 158—118)

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This invention relates to certain new and useful improvements in gas burners of atmospheric types and has more particular reference to a novelly constructed burner ring and an equally novel complemental air and gas mixing unit which is attachable to said burner ring.

An object of this invention is to provide an improved burner ring with a gas and air chamber made of inexpensive construction in that there are two ring components or sections joined together by welding, one of which is provided with a number of ports to accommodate port tips and the other of which is provided with an opening with a baffle thereover, said opening having an air and gas mixer in registry therewith, the mixer being of improved design in that it is made of two sections which, when connected together, form a conduit.

Another object of this invention is to provide an improvement in the air mixer in the manner of supporting the air shutter nipple in a ring or collar of a yoke, the yoke having its ends disposed in pockets formed by offsets in the mounting flanges for the sections of the air and gas mixer.

Other objects will become apparent in following the description of the illustrated form of the invention.

In the drawings:

Figure 1 is a plan view of the assembly, some of the port tips and ports being omitted;

Figure 2 is a front view of the device in Figure 1;

Figure 3 is an enlarged transverse sectional view taken substantially on the line 3—3 of Figure 1 and illustrating the port tip, baffle and air-gas mixer assembly at their respective connections;

Figure 4 is a sectional view taken substantially on the line 4—4 of Figure 3 and in the direction of the arrows;

Figure 5 is an exploded perspective view of the component parts of the device; and

Figure 6 is a fragmentary perspective view of the outer end of the air mixer assembly, the shutters and the means of retaining the shutters in place being omitted.

The illustrated burner construction has been designed primarily for use with the stove construction illustrated in my co-pending application, Serial No. 188,361, which was filed on October 4, 1950, although the burner construction is of general application and utility. As is apparent from the drawings the burner assembly employs any standard type of gaseous fuel.

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The assembly consists of two main portions, the burner generally indicated at 10 and the air or air-gas mixer 12. The burner consists of an upper burner ring 14 which is substantially channel shaped in cross section and which has laterally projecting flanges 16 and 18 at the edges thereof. The lower ring 20 is also substantially channel shaped in cross section and has the flanges 22 and 24 extending from the edges thereof. The flanges 18 and 16 are disposed upon the flanges 24 and 22 so that junctions 26 and 28 may be formed by welding (Figure 3). This defines the fuel chamber 30 within the burner ring assembly.

The upper ring is provided with a number of ports 32 into which port tips 34 are fitted and then welded. The tips have reduced lower necks 36 (Figure 3) which fit directly in the ports 32 for facility in joining the tips firmly to the upper ring 14.

There is an opening 38 punched or otherwise formed in the bottom of the lower ring 20 so that the discharge end of the air mixer 12 may be held in registry therewith. A flange 40 is provided at said discharge end of the air mixer and is welded to the bottom surface of the lower burner ring 20 (Figures 3 and 4) whereby the mixture of gas and air passing through the opening 38 may impinge upon the baffle 42 which is disposed in the fuel chamber 30. This baffle is welded to the sides of the upper ring 14 and extends a short distance in the fuel chamber 30 so as to direct the fuel and air in a circular travel as disclosed by the arrows in Figure 4.

The air mixer 12 is of Venturi shape with an elbow 46 at one end thereof. It is at the upper end of the elbow 46 that the flange 40, constituting a seat, is provided. As disclosed in Figure 5 the air mixer is formed of two longitudinal sections, each section being concave so that when the sections are joined together the Venturi shape conduit is formed. A pair of flanges 48 and 50, respectively, are provided on the edges of the section 52, while the flanges 54 and 56 are provided on the edges of the section 58. The outer end of each section 52 and 58, respectively, cooperates to form an air scoop or air inlet funnel 60 and the flanges of each section extend outwardly sufficiently far to be located on the air scoop. The flanges extend inwardly sufficiently far to join with the flange 40. Accordingly the sections are placed together so that the flanges confront and then the flanges are welded together in the assembly of this portion of the air mixer.

The flanges are provided with offsets 62, 64,

66 and 68 at their outer ends, the offsets 62 and 66 cooperating to form a pocket while the offsets 64 and 68 cooperate to form a pocket or socket for the yoke halves 70 and 72.

The yoke halves are placed together to constitute a yoke and define the collar or ring 74 in the center thereof. This collar is fitted in a groove 76 of the air shutter nipple 78 which is threaded on its outer end so that the shutter assembly 80 may be threadedly secured thereto.

In order to hold the air scoop 60 end of the air mixer assembled properly the yoke is simply inserted in the pockets after the collar 74 has been disposed in the groove 76, this holding the nipple 78 concentrically arranged with the outer edge of the scoop or air inlet member 60.

As disclosed in Figure 6 an abutment is formed by the flanges 82 and 84, one of which is provided on the outer end of each section 52 and 58, so that the shutter assembly 80 may be screwed tightly thereagainst.

The aforementioned port tips 34 are in actual practice produced from stainless steel rod which is axially bored and has one end reduced to provide the aforementioned assembling and retaining neck 36. The necks project into the punched ports and are preferably welded and thus securely anchored in place.

Both upper and lower ring sections are die-formed from cold rolled steel sheet of prescribed gauge. The lower ring section is punched, as shown, at a point where the elbow of the air mixer unit or conduit is assembled and joined. As explained, the sections are assembled by gas welding the flanges together at the points of abutment on both inner and outer peripheral portions. Prior to assembly, a baffle plate, of the shape shown, is welded in place at the top section so that it will line up with the underlying opening in the lower section. The obvious function of the baffle is to diverge a direct flow of incoming fuel so that it will be properly distributed in the circulating chamber.

It is repeated that the air mixer conduit or unit is likewise characterized by semi-circular half-sections which are die-formed of cold rolled sheet steel of prescribed gauge requirements. Flange means is provided on the inner elbow end for attachment to the burner ring by way of welding and flange means is provided on the mouth portion of the conical funnel to properly accommodate the shutter assembly means 80. The yoke halves are formed of duplicate components bent between their ends to provide the desired nipple encirclement and retaining means, the end portions being conveniently seated in the recesses or pockets for expeditious assembling and welding.

Having described the invention, what is claimed as new is:

1. An atmospheric air and gas mixer unit for a burner ring comprising an L-shaped conduit embodying elongated duplicate half-sections of semi-circular cross-section having lengthwise outstanding marginal assembling flanges, the respective flanges being matched, abutted, and welded together, the inner end of said conduit providing a lateral burner ring attaching elbow, the latter being also provided with flanges for welded connection with said ring, the outer end of said conduit having an integral conical air and gas intake funnel, the intake end of said funnel having complemental outstanding marginal flanges, the terminal ends of said marginal flanges at the mouth of said cone being offset and spaced apart and providing diametrically opposite recesses, a two-part yoke, the parts thereof abutting each other and providing a nipple encircling band and attaching ends for said yoke, the respective attaching ends being seated in said recesses, and a concentric screw-threaded nipple having one end embraced by and attached to said band, and said attaching ends being welded in said recesses and thus serving to assemble and join said yoke with said cone and said nipple with said yoke.

2. An atmospheric air and gas mixer unit for a burner ring comprising conduit embodying elongated duplicate companion half-sections having lengthwise outstanding marginal assembling flanges, the respective flanges being matched, abutted and welded together, the inner end of said conduit have means for attachment to the stated burner ring, the outer end of said conduit having integral conical air and gas intake funnel, the intake end of said funnel being provided with a pair of diametrically opposite pockets respectively in alignment with the adjacent terminal ends of the respective lengthwise assembling flanges, a nipple and yoke disposed axially of said funnel, said yoke having a circular band portion encircling and attached to the inward end of said nipple and having diametrically opposite attaching ends radiating from said band portion and seated in and anchored in said pockets.

3. A gas and air mixer having lateral means at one end thereof for fastening said mixer in registry with an opening in a gas burner ring, said mixer being a conduit and including a pair of longitudinal sections, each section having a pair of flanges extending longitudinally thereof, the flanges on one section being welded to the flanges of the other section, a flared air funnel secured to the opposite end of said conduit, the flared intake end of said funnel having outstanding semi-circular coplanar marginal flanges, the adjacent ends of said latter flanges being spaced apart and having terminal offset portions joined with the adjacent terminal ends of said longitudinally extending flanges and defining a pair of diametrically opposite pockets, a nipple disposed axially in respect to said funnel and having a circumferentially grooved inward end portion, and a nipple assembling and anchoring yoke, the latter embodying a central circular band portion encircling the nipple and seated in the circumferential groove and also embodying attaching ends, the latter being seated and anchored in said pockets.

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