Feb. 6, 1945. C. L. DEWEY 2,368,646

GAS BURNER

Filed April 10, 1943

Fig. 1

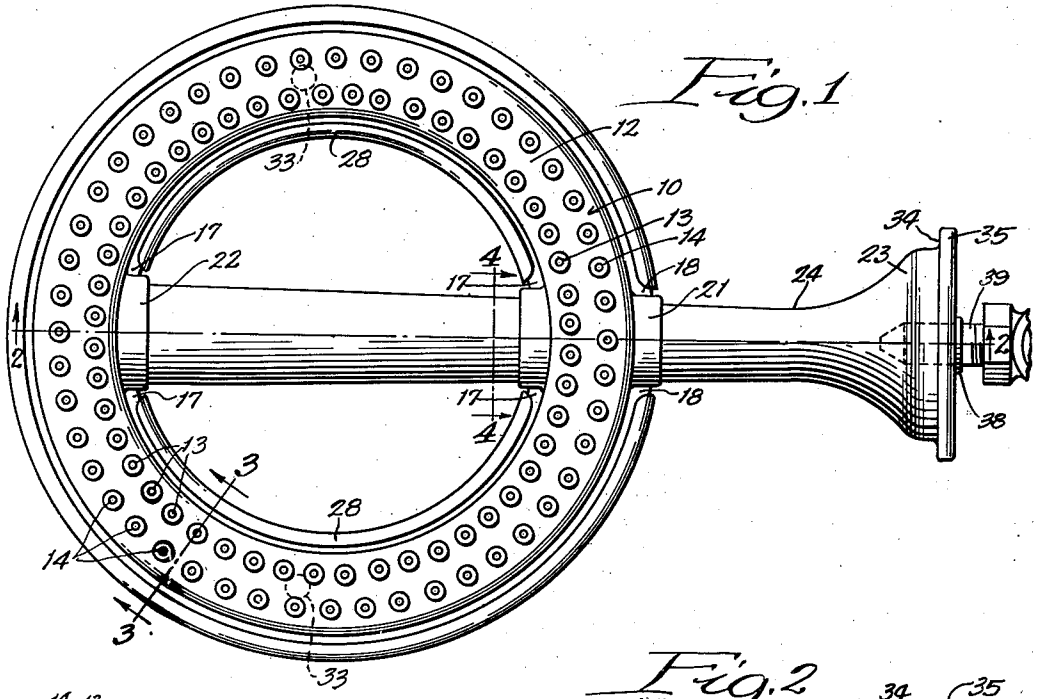


Fig. 2

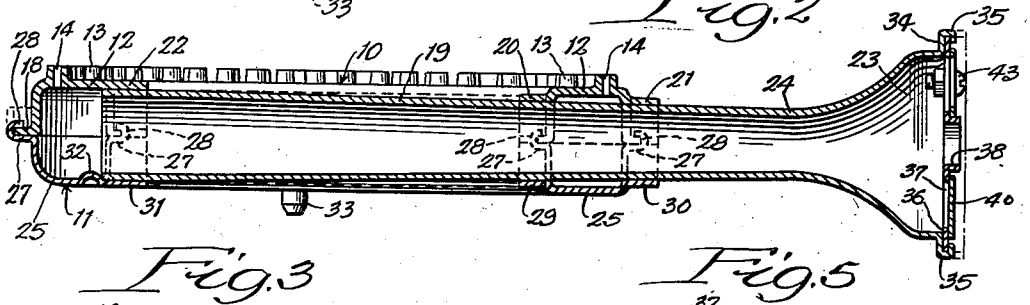


Fig. 3

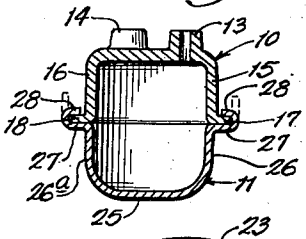


Fig. 5

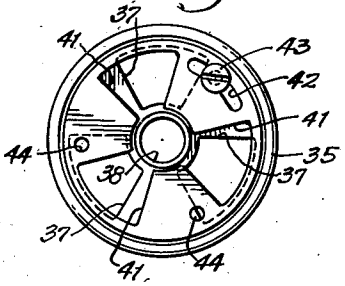
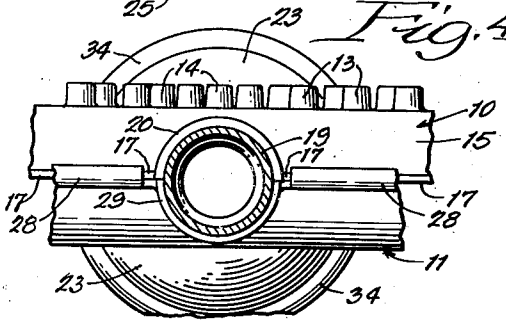


Fig. 4



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GAS BURNER

Clarence L. Dewey, Elkhart, Ind.

Application April 10, 1943, Serial No. 482,540

6 Claims. (Cl. 158—99)

The present invention is directed to the structure and formation of a gas burner in such a way as to simplify and facilitate the fabrication of the burner and permit the body thereof to be constructed in two sections which may be readily united without the employment of extraneous fastening means.

The body portion of the burner as shown is of ring-shaped formation and consists of upper and lower sections, the former of which is preferably produced by a die casting operation, and the latter by a stamping operation with the parts so correlated that they may be readily assembled and united in the manner presently to be described. The body portion of the burner provides a mounting for the intake duct for gas and air which, when the body sections are assembled, will be clamped and held rigidly in position without the employment of extraneous fastenings, so that the burner as a whole may be cheaply and readily manufactured and assembled in such a way as to insure uniformity in the resulting product.

Further objects and details will appear from a description of the invention in conjunction with the accompanying drawing wherein,

Figure 1 is a top plan view of the burner as a whole;

Fig. 2 is a section taken on line 2—2 of Fig. 1 looking in the direction of the arrows;

Fig. 3 is a cross-sectional view of the body of the burner taken on line 3—3 of Fig. 1 looking in the direction of the arrows;

Fig. 4 is a sectional view taken on line 4—4 of Fig. 1 looking in the direction of the arrows; and

Fig. 5 is a face view of the end of the duct for the gas-air mixture.

The body of the burner is of ring-shaped formation and consists of an upper section 10 and a lower section 11. The upper section is preferably in the form of a die casting of aluminum, while the lower section preferably consists of an aluminum stamping. The upper section comprises a ring-shaped top wall 12 provided with inner and outer concentric rows of burner nozzles 13 and 14 which are in the form of short upstanding tubular ports integrally cast with the top wall, so that subsequent drilling, aside from a slight smoothing or reaming operation, is unnecessary.

The upper wall unites with inner and outer depending cylindrical walls 15 and 16 having outwardly protruding flanges 17 and 18 around their lower margins. This configuration is continuous throughout the ring save at the points provided for the reception of a gas-air duct 19, the inner end of which bridges across the interior of the upper ring-shaped burner.

In order to provide for the fitting of the duct, the upper section of the burner on the right-hand side in Fig. 1 is provided with inner and outer half-cylindrical collars 20 and 21 which protrude away from the inner and outer walls of the upper body ring, the flanges 17 and 18 being interrupted at these points and merging into the collars. Similarly, on the opposite side of the upper body ring, there is formed a single half-cylindrical collar 22 which interrupts and merges into the flange 17.

The gas-air duct 19 is in the form of a Venturi tube which at its outer or intake end is flared to provide a bell-shaped head portion 23 connecting with the body of the tube through a neck 24 toward which the body is gradually tapered so that the tube progressively decreases in diameter to the base of the neck.

The opposite or inner end of the tube therefore, which is fitted within the collar 22 is of slightly greater diameter than the intermediate portion of the tube which fits through the collars 20 and 21, so that the inner diameters of the respective collars will vary to afford a close fit around the upper surface of the tapered tube wall.

The upper body ring unites with the lower body ring 11 which is of annular trough-shaped configuration comprising a circular base wall 25 and inner and outer cylindrical walls 26 and 26a respectively. The upper margins of the inner and outer walls are outwardly shouldered as at 27 and terminate in flanges 28 which initially extend upwardly as shown in dotted lines in Fig. 3 to permit the fitting of the upper body ring thereto, but are thereafter bent into hook formation as shown in full lines, thereby clamping the two sections together to provide a continuous annular channel interrupted only by the passage of the gas-air duct therethrough.

The walls of the lower body ring on the right-hand side are interrupted to provide inner and outer half-cylindrical collars 29 and 30, the edges of which register with the collars 20 and 21 to provide a full cylindrical, slightly tapered, passageway for the intermediate section of the gas-air tube, while on the opposite side, the inner wall of the lower body ring is interrupted to provide a half-cylindrical collar 31 which registers with the upper collar 22 to provide a socket for the inner end of the gas-air tube which abuts against a boss 32 which serves as a stop for holding the inner end of the tube in spaced relation from

the outer walls of the annular passage, so that the gas-air mixture will flow freely into and circulate through an annular channel which communicates with the burner nozzles.

In order to insure the proper location of the burner in a hot water heater or other heating unit, I provide, on opposite sides of the lower body ring, a pair of downwardly protruding dowel bosses 33 which may be formed in the stamping operation or separately formed and spot-welded or riveted to the base of the lower body section.

The flared head 23 of the gas-air tube is shouldered at 34 and terminates in a flange 35 which originally extends outwardly as shown in dotted lines in Fig. 2, but which is thereafter bent to hook-shaped formation to engage the margin of a fixed shutter plate 36 which is provided with a series of segmental intake ports 37. The center of the shutter plate is outwardly protruded to provide a flanged aperture 38 for the reception of a gas tube 39. The fixed shutter plate 36 cooperates with a movable shutter 40 which is likewise cut away at 41 to provide a series of segmental apertures adapted in greater or less degree to register with the apertures in the fixed shutter plates.

The movable shutter is rotatably mounted upon the center flange of the fixed plate and is provided with an arcuate slot 42 through which extends a headed screw 43 carried by the fixed shutter plate which permits the movable shutter to be adjusted to regulate the extent of registry of the intake ports in the fixed and movable shutters. In order to balance the intake of air when the movable shutter is adjusted to a partly closed position, I provide a pair of apertures 44 located in opposed relation to the slot 42, so that when the slot in the movable shutter is moved to the partially open position shown in Figure 5, the apertures 44 will register with the respective opening in the inner shutter plate and balance the inflow of air admitted through the end of the slot 42, thus substantially equalizing the air inflow at the points indicated.

From the above description, it will be seen that the construction is one which permits the various parts to be readily fabricated and easily assembled by simply locating the gas-air duct within the lower body ring with its inner end and intermediate sections in registry with the trough-shaped collars 31, 29, and 30, after which the upper section will be positioned within the confines of the upstanding flanges 28 which are thereupon upset to provide overhanging hook-like connections which serve to hold the parts firmly together and in sufficiently close contact to prevent the escape of gas.

The upper section in the form of a die casting will require little, if any, machining other than possibly a light reaming of the burner ports to afford smooth wall surfaces for the discharge of the gas-air mixture.

The gas-air duct may be readily formed from a length of cylindrical tubing, preferably of aluminum, which is configured to provide the desired taper and flaring head by the method shown and described in the Dewey Patent No. 2,265,723, issued December 9, 1941, which permits an extended length of tubing to be so configured as to provide for a plurality of units which are thereafter cut apart and outwardly expanded at the head end to provide the flanges 35. The method of configuring the parts, however, forms no part of the present invention and need not be described in further detail.

By forming the burner from aluminum in the manner described, a light, strong, and serviceable burner will be provided which may be cheaply produced and which will not be subject to corrosion by contact of gas or otherwise subject to deterioration during the long period of use.

Although I have employed the terms "ring-shaped" and "cylindrical" in defining the configuration of the body sections, it will be understood that these terms are intended to cover departures from a truly circular formation and to include ovate and elliptical or polygonal forms adapted to be united in the manner herein described, and that the present invention is directed rather to the means provided for assembling and uniting the sections than to the particular configuration thereof.

I claim:

1. In a gas burner of the class described, the combination of a ring-shaped body consisting of upper and lower sections, each of the sections comprising a ring-shaped body wall merging into inner and outer side walls, the side walls of one of the sections being provided with outwardly extending flanges, and the walls of the other section being provided with hook-shaped flanges engaging the flanges of the first section, the body wall of the upper section being provided with a multiplicity of gas-burner ports, the inner and outer side walls of the body sections on one side being provided with half collars having their edges in registering relation and the inner walls of the sections on the opposite side being provided with registering half collars, and a gas-air duct extending through the registering half collars first mentioned and having its inner end socketed within the registering half collars last mentioned.

2. In a gas burner of the class described, the combination of a ring-shaped body consisting of upper and lower sections, the upper section being in the form of a die casting and the lower section being in the form of a metal stamping, each of the sections comprising a ring-shaped body wall merging into inner and outer side walls, the side walls of the upper section being provided with outwardly extending flanges, and the side walls of the lower section being provided with hook-shaped flanges engaging the flanges of the first section, the body wall of the upper section being provided with a multiplicity of gas-burner ports, the inner and outer side walls of the body sections on one side being provided with half collars having their edges in registering relation and the inner walls of the sections on the opposite side being provided with registering half collars, and a gas-air duct extending through the registering half collars first mentioned and having its inner end socketed within the registering half collars last mentioned.

3. In a gas burner of the class described, the combination of a ring-shaped body consisting of upper and lower sections, each of the sections comprising a ring-shaped body wall merging into inner and outer side walls, the side walls of one of the sections being provided with outwardly extending flanges, and the walls of the other section being provided with hook-shaped flanges engaging the flanges of the first section, the body wall of the upper section being provided with a multiplicity of gas-burner ports, the inner and outer side walls of the body sections on one side being provided with half collars having their edges in registering relation and the inner walls of the sections on the opposite side being provided

with registering half collars, and a gas-air duct extending through the registering half collars first mentioned and having its inner end socketed within the registering half collars last mentioned, the gas-air duct tapering from its inner socketed end to a progressively smaller diameter at the location where it passes through the registering half collars in the inner and outer walls, and the respective collars being of correspondingly decreasing inner diameter to closely embrace the gas-air duct at all points of engagement.

4. In a gas burner of the class described, the combination of a ring-shaped body consisting of upper and lower sections, the upper section being in the form of a die casting and the lower section being in the form of a metal stamping, each of the sections comprising a ring-shaped body wall merging into inner and outer side walls, the side walls of the upper section being provided with outwardly extending flanges, and the side walls of the lower section being provided with hook-shaped flanges engaging the flanges of the first section, the body wall of the upper section being provided with a multiplicity of gas-burner ports, the inner and outer side walls of the body sections on one side being provided with half collars having their edges in registering relation and the inner walls of the sections on the opposite side being provided with registering half collars, and a gas-air duct extending through the registering half collars first mentioned and having its inner end socketed within the registering half collars last mentioned, the gas-air duct tapering from its inner socketed end to a progressively smaller diameter at the location where it passes through the registering half collars in the inner and outer walls, and the respective collars being of correspondingly decreasing inner diameter to closely embrace the gas-air duct at all points of engagement.

5. In a gas burner of the class described, a body consisting of upper and lower sections, the upper section being in the form of a casting and the lower section being in the form of a metal stamping, each of the sections comprising a body wall merging into inner and outer side walls, the side walls of one of the sections being provided with outwardly extending flanges and the walls of the other section being provided with hook-shaped flanges engaging the flanges of the first section, the body wall of the upper section being provided with a multiplicity of gas burner ports, the inner and outer side walls of the body sections on one side being provided with half collars having their edges in registering relation and the inner walls of the sections on the opposite side being provided with registering half collars, and a gas-air duct extending through the registering half collars first mentioned and having its inner end socketed within the registering half collars last mentioned.

6. In a gas burner of the class described, a body consisting of upper and lower sections, the upper section being in the form of a casting and the lower section being in the form of a metal stamping, each of the sections comprising a body wall merging into inner and outer side walls, the side walls of one of the sections being provided with outwardly extending flanges and the walls of the other section being provided with hook-shaped flanges engaging the flanges of the first section, the body wall of the upper section being provided with a multiplicity of gas burner ports, the inner and outer side walls of the body sections on one side being provided with half collars having their edges in registering relation and the inner walls of the sections on the opposite side being provided with registering half collars, and a gas-air duct of Venturi shape extending through the registering half collars first mentioned and having its inner end socketed within the registering half collars last mentioned.

CLARENCE L. DEWEY.