

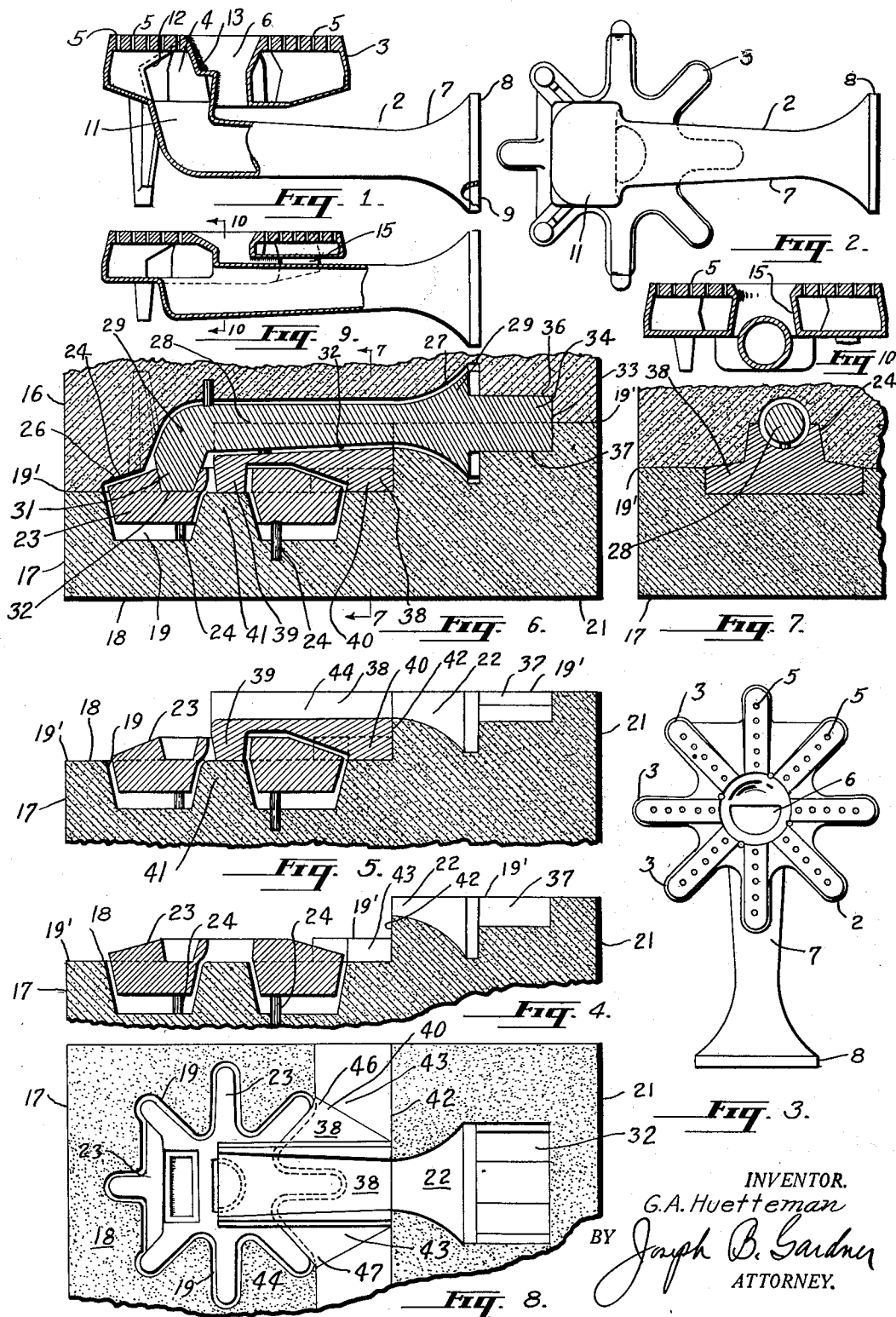
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MOLD FOR CASTING GAS BURNERS

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MOLD FOR CASTING GAS BURNERS

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The invention relates to the technical design and method of forming burners for gas stoves and the like, and relates more particularly to gas burners used for heating the front portion of the stove cooking top.

An object of the invention is to provide a burner of the character described which notwithstanding the extreme proximity of the burner openings to the primary air orifice, will provide a sufficient length of throat to insure proper mixing of the gas and primary air by the time the mixture reaches the burner openings, without requiring a circuitous path for the gas or effecting the access of the secondary air to the flame jets.

Another object of the invention is to provide a burner formed to provide the above mentioned advantages, which may be constructed in one piece and molded in one operation.

The invention possesses other objects and features of advantage, some of which, with the foregoing, will be set forth in the following description of the preferred form of the invention which is illustrated in the drawing accompanying and forming part of the specification. It is to be understood, however, that variations in the showing made by the said drawing and description may be adopted within the scope of the invention as set forth in the claims.

Referring to said drawing:

Figure 1 is a longitudinal sectional view of the burner, with part in elevation.

Figure 2 is a bottom view of the burner.

Figure 3 is a plan view of the burner.

Figures 4, 5 and 6 are similar longitudinal sectional views of the molding parts, illustrating successive stages in the molding process of the burner, portions being broken away to reduce the size of the figures.

Figure 7 is a transverse sectional view of the mold as shown in Figure 5, the plane of the section being indicated by the line 5—5 in said latter figure.

Figure 8 is a plan view of the mold parts shown in Figure 5.

Figure 9 is a view similar to Figure 1, showing a modified form of the burner.

Figure 10 is a transverse sectional view of the burner taken on the line 10—10 of Figure 9.

As illustrated in the drawing, the burner 2 in the present embodiment of the invention is of the star type and comprises radially disposed hollow arms 3 which communicate with and extend from a common annular conduit 4 and are provided on their upper side with a plurality of burner openings or flame ports 5. The center portion of the

conduit is formed with an opening 6 from the top to bottom of the burner so that secondary air may be supplied to the flame jets from the inner end of the arms as well as from between arms and the outer ends thereof.

In the use of gas burners for heating the cooking top of a stove or plate, in many instances the burners, particularly the front ones, are necessarily positioned in very close relation to the primary air intake or mixing chamber which is disposed at the outer extremity of the tube or throat which connects the interior of the burner to the manifold pipe at the front of the stove. This condition of short throat distance is usually existent in concealed manifold installations, as in such case the mixing chambers are frequently positioned directly under the cooking top. A short throat, as will readily be evident, fails to provide a sufficient period during which the air and gas may be intermingled in their passage to the burner openings, and consequently an ill-proportioned mixture is supplied for burning. To obtain the additional or necessary length of throat, efforts have heretofore been made to connect the throat to the rear and sides of the burner instead of to the front as has usually been the case. Where the side connection was adopted, not only was the delivery of the mixture to the burner uneven, but the offset relation of the throat pipe made the proper positioning of the burner and pipe comparatively difficult. On the other hand, where a rear or a center connection was used, the center opening for the secondary air was necessarily obstructed or entirely eliminated, unless the burner was cast in several pieces—a condition which involved a subsequent machining of parts and assembling by hand. In accordance however with my invention the burner may have a center rear throat connection with a full secondary air supply at the middle of the burner and at the same time the entire burner, including the throat pipe and mixing chamber, is cast entirely in one piece with no machining necessary.

As will be clear from Figure 1, the burner has as an integral part thereof a connector tube 7 which provides the throat for the burner and has formed at the outer extremity thereof a mixing chamber 8 having primary air orifice 9 and into which the gas from the manifold is delivered. The tube is connected to the burner so that the gas mixture will be delivered from the throat into the portion of the burner conduit directly to the rear of the secondary air opening 6. The tube 7 it will be noted is disposed below

but in spaced relation to the portion of the burner containing the opening 6 so that air is free to pass into the latter from the bottom of the burner and thereby insure proper supply to the flame ports adjacent the inner end of the arms. The portion of the tube connecting the burner is enlarged to provide a header 11 and the latter is so formed as to allow the gas mixture to ascend directly therefrom into all of the rear arms of the burner while the arms at the center and front of the burner will be supplied with the gas mixture directed forwardly from the header by the rear deflecting-wall 12 thereof which, as will be seen in Figure 1, has a bottom portion which slopes rearwardly and an upper portion which slopes forwardly and merges with the upper portion of the conduit 4. The front wall 13 of the header is also preferably inclined forwardly so as to more directly guide the gas mixture toward the forward portion of the burner.

In Figures 9 and 10 I have shown a somewhat modified form of the burner. In this embodiment, in order to provide a minimum depth between the top of the burner and the bottom of the tube, I form in the portion of the burner overlying the tube a depression 15 in which practically the entire upper portion of the tube is arranged to lie, the sides of the depression being shaped in conformity with and spaced from the adjacent sides of the tube so that the passage of air to the secondary supply opening will be readily permitted.

It will now be clear that a burner meeting all the requirements for the front portion of cooking types of modern gas stoves is thus provided in the form of a single integral member. It will however also be evident to those skilled in the art that the molding of such burner as a single casting would ordinarily be such a complex and expensive matter as to render the forming thereof in this manner entirely impractical. I have, however, discovered a method by which the burner may be molded in one piece in a relatively simple manner.

The method of molding the burner is clearly illustrated in Figures 4 to 8 inclusive and consists in providing upper and lower mold sections 16 and 17 formed of green sand and respectively made in the cope and drag of the molding flask. The mold section 17, as will be clear from Figure 8, is formed at one end portion 18 with a star shaped depression 19 which provides the external surface of the upper portion of the burner proper. The parting 19' of the mold 17 is irregular and is in a higher plane at the end portion 21 in which is formed a depression 22 to provide for the upper exterior half of the mixing chamber end of the throat tube. Arranged to lie within the depression 19 is an annular dry-sand core 23 which is supported in spaced relation therein by means of chaplets 24. The core 23 defines the inner surface of the burner proper and the part thereof which forms the upper portion of the burner lies within the depression whereas the part which forms the lower portion extends above the parting 19'.

The mold section 16 has a parting in complement to section 17 and is formed with a single depression 24, one end portion 26 of which is arranged for defining the rear and side portion of the bottom part of the burner while the remaining portion 27 of the depression is arranged for defining the under side of the throat tube as well as the sides and bottom of the header. Arranged to be positioned within the depression 24 is a dry-

sand core 28 for the interior of the tube, one end 29 of which is provided with a projection 31 which is arranged to seat in a correspondingly formed recess 32 in the core 23 so as to support the end 29 in position. The other end 33 of the core 28 is provided with a print 34 which is arranged to seat with opposed portions 36 and 37 of the depressions.

It will now be clear that all surfaces of the burner are provided for, except first, the upper exterior surface of the portion of the tube between the head and the flared end which defines the mixing chamber, second, the exterior surface of the burner defining the lower portion of the secondary air passage, and third, the exterior bottom portion of the front part of the burner proper. As a means of providing for the molding of the three surfaces aforesaid, I provide an additional dry-sand core 38 which is arranged to be interposed between the core 23 and core 28. The core 38 is arranged to be supported on the parting surface 19' of the portion 18 and as clearly shown in Figure 5, the under side of the core is depressed to thereby provide angular extensions 39 and 40 at the forward and rear extremities of the core, the extension 39 being designed to engage in the central opening of the core 23 and join with the central protuberance 41 of the mold portion 18 to completely define the secondary air passage through the burner. The extension 40 is adapted not only to rest on the parting surface 19', but is arranged to abut against the upright wall 42 at the inner edge of portion 21. Lateral displacement of the core is prevented by means of side portions 43 formed in the mold 17 and against which the opposite sides of the extension 40 are arranged to fit. It will thus be seen that the core 38 will be effectively held in position during the casting operation. The upper surface of the core is arranged to lie coplanar with the parting surface of portion 21 and is formed with a concavity 44 for its full length so as to provide for the upper exterior surface of the throat tube. As will be clear from Figure 8 the core is formed with lateral extensions 46 and 47 so that practically all forward sides of the bottom portion of the forwardly disposed burners arms will be formed by the core.

In preparing and assembling the mold for operation, the green-sand mold section 17 is first placed in position and the burner core 23 set in the depression 19 as illustrated in Figure 4. Then the core 38 is set over core 23 and rested on the section 17 as illustrated in Figure 5. Next the core 28 is positioned over core 38 with the end 29 supported on the core 23 and the end 33 set in the mold section. With the cores thus properly arranged and held on the lower section, the upper section 16 is placed thereover as indicated in Figure 6, and the mold thereby made complete for the effective casting of the entire burner in one piece.

I claim:

1. A means for casting in one piece a top gas burner having a hollow burner body with a secondary-air passage therethrough and a throat tube connected to the body at the bottom of the rear portion thereof and extending under and in spaced relation to said passage, which comprises a bottom mold having a depression corresponding to the upper portion of said body, and another depression in spaced relation to the first depression corresponding to the free extremity of said tube, a core positioned in said first depression and corresponding to the interior of said body, a second core positioned over the forward portion of said

core and supported on said bottom mold and defining the under portion of the forward part of the burner and the upper portion of the tube, a third core positioned over the second core and corresponding to the interior of the tube and with its rear end resting on the rear portion of the first core and its forward end supported on said bottom mold in the second depression aforesaid, and an upper mold positioned over said cores and supported on the lower mold and having an impression therein corresponding to the under side of the tube.

2. A means for casting in one piece a top gas burner having a hollow burner body with a vertical secondary air passage therethrough and a throat tube connected to the body at the bottom of the rear portion thereof and extending under and in spaced relation to said passage, which comprises a bottom mold having a depression corresponding to the upper portion of said body and another depression in horizontally and vertically spaced relation to the first depression corresponding to the free extremity of said tube, a core positioned in said first depression in spaced relation to said mold and corresponding to the interior of said body, a second core positioned over the forward portion of said first core and supported on said mold and corresponding to the under portion of the forward part of the burner and the upper portion of the tube, a third core positioned over the second core and corresponding to the interior of the tube and with its rear end resting on the rear portion of said first core and its forward end supported on said mold in the second depression aforesaid, and an upper mold positioned over said cores and the lower mold and having an impression therein spaced from said third core and corresponding to the under side of the tube.

3. In a mold for forming a gas burner, a mold section having a recess therein, a ring core mounted in said recess in spaced relation to said

section, a member bridging a portion of said ring core and supported on said section at a point without and a point within said ring core, and a cylindrical core supported at one end on said section and extending over said member and supported at its other end on said ring core, and a second mold section supported on said first section and disposed in superimposed relation to said cores and member.

4. In a mold for forming a gas burner, a mold section having an annular star shaped recess therein, an annular star shaped ring core mounted in said recess in spaced relation to said section, a member bridging a portion of said ring core and supported on said section at a point without and a point within said ring core, said ring core having a recess therein, and a cylindrical core supported at one end on said section and extending over said member and supported at its other end within said ring core recess, and a second mold section supported on said first section and disposed in spaced relation to said cylindrical and ring cores.

5. In a mold for forming a gas burner, a pair of recessed mold sections, a core mounted within and spaced from said sections, a member bridging a portion of said core, and an elongated core supported at one end on one of said sections and extending in spaced relation over said member and first core and supported at its other end on said first core.

6. In a mold for forming a gas burner, a pair of recessed mold sections, a star shaped core mounted within and spaced from said sections, a member bridging a portion of said core and supported at its ends on one of said sections, and an elongated core supported at one end on one of said sections and extending in spaced relation over said member and first core and supported at its other end on said first core.

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