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WATER HEATING MEANS

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2 Claims. (Cl. 158—99)

This invention relates to the burner element of hot-water heaters wherein the advantage of a vertical coil of water tubing is to be subject to burner means for heating same.

The advantages of the invention are:

The provision of a vertical or columnar form of burner element, which will offer a graduated arrangement of flame jets in keeping with the water temperature rising in a surrounding helical coil.

The offering of a burner designed of several parts, fashioned to readily form an economical heat distributing means; easily assembled, or dismantled without injury to the parts concerned; which eliminates the need for frequent cleaning and the accumulation of dirt resulting in heaters of this classification, requiring the removal of same in order to maintain the desired efficiency. Also, the purposeful shaping of concerned elements and features thereof which lend themselves to economical manufacturing, both as to the production of the several parts, or their joining together in forming the operative entity.

The drawing’s several figures are indexed as follows:

Fig. 1 is an elevation showing this improvement in relation to its associated elements.

Fig. 2 a perspective view of a principal part of this invention.

Similar characters of reference apply to like parts and features throughout the several views. The disclosure of the drawing is assumed to be diagrammatic of any arrangement within the scope of the principle involved; what is here illustrated being a preferred combination of necessary elements chosen because of their simplicity as articles of manufacture.

Referring to the drawing, W indicates a water-heater shell of the customary variety inclosing a vertically disposed helical water-tube coil C, shown in dot-and-dash line. The gas supply for said heater is through a pipe G located to be coincident to the vertical axis of the aforesaid coil, and to be the supporting member of the burner improvement here the primary subject of the following detailed description:

This improvement, or burner means, comprises a tubular portion A, and a nozzle portion B fitted together to form a complete and efficient whole, rigidly supported by the gas-pipe G to occupy an advantageous position along the heating coil’s longitudinal axis, wherefrom radially directed flame jets issue throughout and around the encircling water tube C. This preferred arrangement is a noticeable departure from the heretofore method of having the coil C concentric and superposed over the “mushroom” type of burners, whose annularly disposed jets unavoidably function as “catch-alls” for the equally unavoidable dirt products common in devices of this sort. The vertical burner innovation subjects all of the water tube element to direct flame which latter can be, and in this instance is, arranged to be proportionate to the increasing temperature of the passing fluid. The jet features of the present invention are graduated as to orifice diameter and spacing of same in order to assure the maximum of heating efficiency with a minimum of gas. This necessitates that the lowermost jet aperture be the largest opening and the uppermost jet the smallest one; also, the spacing of the jet openings increases as same ascend; however, these variations are, in appearance and practice, minute differences.

An important aim in the present invention directs itself to the minimizing of manufacturing costs; for this reason the indefinite but popular practice of threading together the parts involved has been eliminated in favor of snugly fitting joints which offer gas-tight coupling and a positive relationship of the said parts without depending upon the unlimited aspects characteristic in elements threaded together. Further, it is a common practice in the concerned art, that, where threaded elements have been subjected to alternate condensation of moisture and a drying heat, the consideration of rust enters so that elements so joined become “frozen”; such a condition presents the alternatives of losing both said elements in attempting to unscrew parts frozen together, or deliberately breaking one of them, the approved course, to minimize loss. In the assembling of elements, as here preferred, the complementing conical formations lessen the requirement for skilled labor, while a light tapping at the jointure effects easy dismantling whenever such is necessary. The burner, being slidable on the supporting pipe G, is readily adjustable there-along for gaining accurate relationship between the gas product employed and the air content requisite to efficient combustion.

Figs. 1 and 3 illustrate the outward aspects of the invention. Fig. 2 shows the inner and relative outer aspects.

The supporting pipe G is always a fixed member in heater assemblies, and in the present case is of smooth surface to receive the nozzle B provided with a boss I of generous length for assuring rigid stability when located on said pipe.
by means of a set-screw 2. The upper end of said nozzle offers a slightly coned terminus 3 which surrounds an upwardly flared bore 4 having a partial “Venturi-tube” aspect. The end 3 fits into a conical bore 5 at the bottom of A and below this the portion A is bell-shaped to arrange a shielding apron 6 annularly opposite air inlets 1 inclinedly piercing the tubular part 8 of the element B. The before-mentioned adjustability of the nozzle B is convenient for locating a tip, or jet 9 in a desirable relation to the said air inlets and the flared mixing chamber, or Venturi-tube 4. The gas mixture generated in the passage 4 rises in the hollow column 10 to supply the burner jets occurring throughout this vertical extension 10. As there are comparatively numerous jet apertures around the element 10, and as same are located to follow a preferred spiral concept for perforating the said element, the actual drilling of same would entail an appreciable amount of labor not in keeping with the relative cost of the burner. To simplify this consideration the tubular portion 10 is cast so as to present depressions 11 wherever the jets 12 occur, thus allowing said apertures to be, either punched through the thinned wall seen in Fig. 2, or drilled with a minimum of effort.

Ready ignition of this class of heater is always conveniently assured by the well-known provision for pilot lights P. In the present tubular form of the element 10 a flame that will surround said tube is required to ignite all of the jets in rapid succession. This effect is attained through the introduction of a segmentary baffle-plate 13 appropriately supported to function as a hood element adjacent above a cluster of jet apertures 12 disposed at the base of the portion 10, where a thin walled area 14 obtains. The said baffle-plate will cause the ignited gas to spread and light those jets opposite to the said pilot light P, the remaining jets being then ignited in turn as will be obvious.

All the concerned apertures being in the vertical aspect, falling dirt will not have any clogging effect. The gas-jet 9, being other than flat, will not intercept falling dirt or rust. Whatever product falling within the column 10 will find lodgement within the enlargement 14, offering a hollow receptacle 15; the latter may be cleared of this product by sliding the burner upwardly 10 off the pipe O to permit of shaking out what little dirt accumulates therein.

Having described the invention what is claimed, and desired to protect by United States Letters Patent, is:—

1. A water heater burner having a separable section supporting a vertical column having a bore therethrough, inclined air inlets piercing said section to directionally affect a fuel jet from a tip axially disposed to the column and closely adjacent said inlets, a draft apron shielding said inlets, a chamber flaring from a restricted diameter surrounding said fuel jet to a major diameter coincident to the bore of said column, an expanded formation fashioned in said section below said inlets, and an integral terminus of said section arranged to support said burner on a fuel supply tube.

2. A water heater burner having a vertical column provided with air directional means influencing an axially disposed fuel jet from a tip terminating a fuel supply line supporting said burner, said burner in turn axially disposed within a vertically arranged helical tube, spirally arranged jet apertures along said column, a cluster of apertures piercing said column adjacent a pilot light, a singular baffle plate above said light and said cluster to service the first recited apertures, all of said apertures occurring in depressions fashioned in the wall of the column.

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