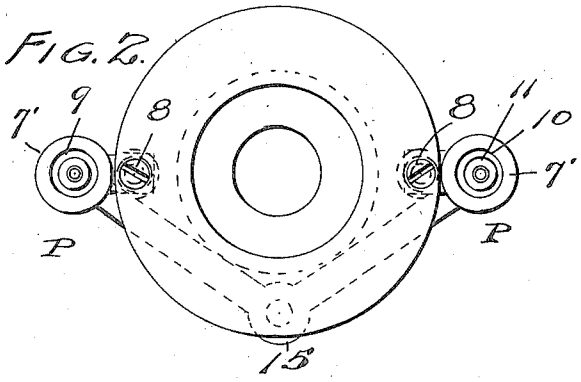
N. G. GOREAU.

PILOT LIGHT.

APPLICATION FILED JULY 3, 1917.

1,302,914. Patented May 6, 1919.

FIG. 2.



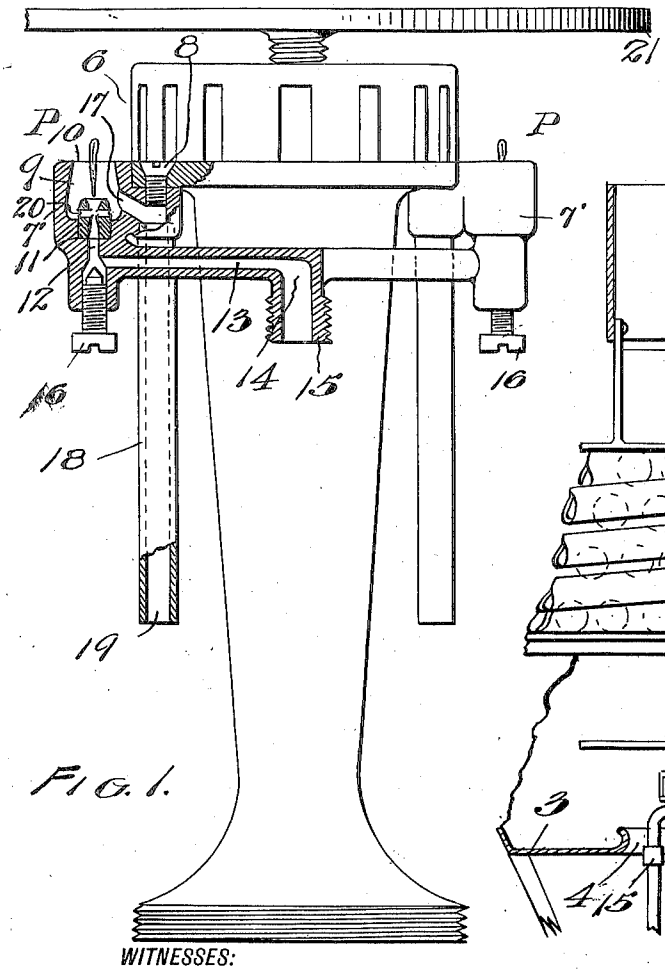
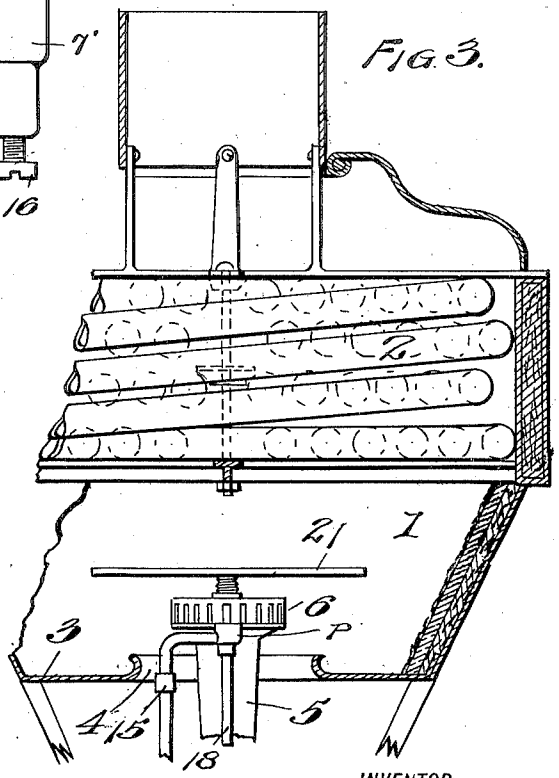


FIG. 1.

FIG. 3.



WITNESSES:

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PILOT-LIGHT.

1,302,914. Specification of Letters Patent. Patented May 6, 1919.

Application filed July 3, 1917. Serial No. 178,465.

To all whom it may concern:

Be it known that I, NELSON G. GOREAU, a citizen of the United States, residing at New Orleans, Louisiana, have invented certain new and useful Improvements in Pilot-Lights, of which the following is a specification.

The invention relates to pilot lights which are especially designed for use with the burners of instantaneous water heaters, but the invention may be adaptable to gas burners for other purposes.

The principal objects of the invention are to reduce the liability of the pilot light to be extinguished; to provide for a smaller and more economical pilot flame; to provide a cleaner flame, that is one which has more perfect combustion and, therefore, does not foul the pilot burner, and to protect the pilot light from moisture.

I have found that the extinguishment of pilot lights of this class is frequently due not only to drafts, but to products of combustion accumulating in the combustion chamber, practically smothering the light regardless of whether there is any appreciable draft of air or gas against the pilot light at the time. The present invention, therefore, seeks to protect the pilot light from being smothered by products of combustion as well as by drafts. This is accomplished by placing the pilot light in a pocket and also by supplying pure air to the pilot light from an external source so that combustion may be supported at all times. A cleaner flame in the pilot is permitted by this external air supply and also by novel features of the pilot burner proper.

The invention provides means for carrying out the above objects and also provides for a duplication of the pilot lights to insure lighting of the main burner even if one of the pilots is extinguished, and the invention further provides improved means of arranging the pilot lights in association with the main burner.

The accompanying drawing shows one exemplifying embodiment of the invention, but after considering this it will be evident that the invention may be embodied in different forms, and I do not limit myself to details except as claimed.

Figure 1 is a side elevation of a representative form of burner with two pilot lights applied thereto, one of the pilot lights and its gas connection being shown in section.

Fig. 2 is a top plan with the water shield omitted, and

Fig. 3 is a vertical section of a representative form of automatic water heater with the invention applied thereto.

Fig. 3 shows a representative form of an automatic water heater having a combustion chamber 1, in the upper part of which is the heating coil 2. At the bottom of the combustion chamber is a pan 3 having a central opening 4 to accommodate the main burner 5, whose head 6 discharges flame in a plurality of separate jets, annularly arranged, below the baffle plate 21, which in the present invention serves the purpose of a water shield, as will later appear. The general organization of a water heater to which the present invention is especially adapted is more fully described in my application, Serial No. 178,464, filed July 3, 1917.

To the main burner head one or more pilot lights P are secured. Each of these comprises a body 7′ secured to the burner head by a screw 8. In the upper part of this body is formed a pocket 9, the opening 10 of which is substantially flush with the bottom of the main gas jets 6 and closely adjacent thereto. In the bottom of the pocket is screwed a burner tip 11 and the gas passage therein communicates with passage 12 leading downward through the body 7′ and there communicating with a passage 13 leading to a T-connection 14, which is employed when a plurality of pilots are used with one main burner or set of main burners. Gas is conveyed to the stem 15 of the T-connection through any suitable pipe. The amount of gas flowing through gas passage 13 to the burner tip 11 is controlled by a needle valve 16 suitably arranged in the lower part of the body 7′ and easily accessible from below for the adjustment of the pilot. Removal of the needle valve permits the burner to be easily cleaned from below.

An air conduit 17 enters pocket 9 at one side near the bottom and this conduit communicates with an air tube 18 suitably secured to the pilot burner body 7′ and extending downward to an intake point 19 which is well removed from the combustion chamber in which the pilot is placed, so that fresh air may be admitted to the pipe 18 at all times. In the arrangement here shown the air pipe 18 extends down through the opening 4 at the bottom of the combus-

tion chamber to a point well below the pan 3, but evidently in other cases the air pipe may lead to any suitable point to insure that it will receive fresh air.

The type of burner tip 11 which may be employed may vary considerably, but in a preferred construction one of the general type shown is used, that is, one which has air-injecting lateral passages 20. In this case the gas passage through the tip is also preferably of Venturi form that is, it has a constricted point, and the lateral air passages 20 enter the gas passage at the point of greatest constriction.

The baffle plate 21 forms a water shield and is suitably mounted above the pilot lights, in this case upon the top of the main burner, and this shield prevents water of condensation formed within the combustion chamber from dripping into the pocket 10 and extinguishing the pilot.

When the needle valve 16 is properly adjusted, the pilot light burns with a small, economical blue flame which extends slightly above the top of the pocket 10. Economy and perfect combustion are promoted when an air-injecting burner tip as above described is employed. Fresh air is supplied through the pipe 18 in ample quantity to support combustion of the pilot flame, and, where an air injecting burner is used, it will draw primary air from this external air supply through the lateral opening 20, and additional air will be furnished at the top of the gas passage to provide for complete combustion. When a blue, perfect-combustion pilot flame is provided for as described, the pilot flame may be made smaller than otherwise, using less gas and at the same time sooting of the burner or the pocket is avoided. When the main burner is extinguished, in heaters of the type shown, a large amount of burned gases may remain in the combustion chamber, and pilot lights as ordinarily constructed are frequently extinguished by the descent of these burnt gases upon the pilot, practically smothering it for want of fresh air. This is prevented in my invention by the supply of fresh air through pipe 18 to the pocket. The pocket also evidently prevents or greatly minimizes the liability to extinguish the pilot light by reason of any drafts that may occur irrespective of the effect of products of combustion. The location of the pilot light in a pocket permits it to be placed very close to the main burner and also prevents the pilot light from being sucked out by any strong draft when the main burner is extinguished.

The described arrangement of parts provides for the convenient duplication of pilot light which is desirable in many cases. In my invention the amount of gas consumed by each pilot is so small that even when one of them is extinguished by unusally severe conditions, the amount of escaping gas until the main burner is again ignited is hardly noticeable either as a matter of cost or as a matter of objectionable odor.

I claim:—

1. The combination with a main gas burner, of a pocket adjacent thereto, a pilot burner tip within the pocket provided with air-injecting openings, and means for supplying fresh air to the pocket.

2. Same as claim 1, with the addition that said means comprises an air pipe communicating with the pocket adjacent to the pilot gas tip and extending to a point remote from the main burner.

3. The combination with a main gas burner of a pilot burner adjacent thereto, a pocket substantially inclosing the pilot burner with the exception of an opening at the top to permit gas from the main burner to come in contact with the pilot flame, and a shield above the pilot burner to prevent water of condensation dropping upon the pilot burner.

4. The combination with a combustion chamber and a main gas burner therein of a pilot burner located near the main burner, a shield substantially surrounding the pilot burner, a gas conduit leading to the pilot burner and an air supply conduit leading from a point outside the combustion chamber to a point within said shield.

5. The combination with a main gas burner of a pocket adjacent thereto, a pilot burner tip within the pocket and an air pipe communicating with the pocket adjacent to the pilot gas burner tip and extending to a point remote from the main burner.

NELSON G. GOREAU.