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3,208,505

HOLDERS FOR PILOT BURNERS, THERMOCOUPLES AND THE LIKE

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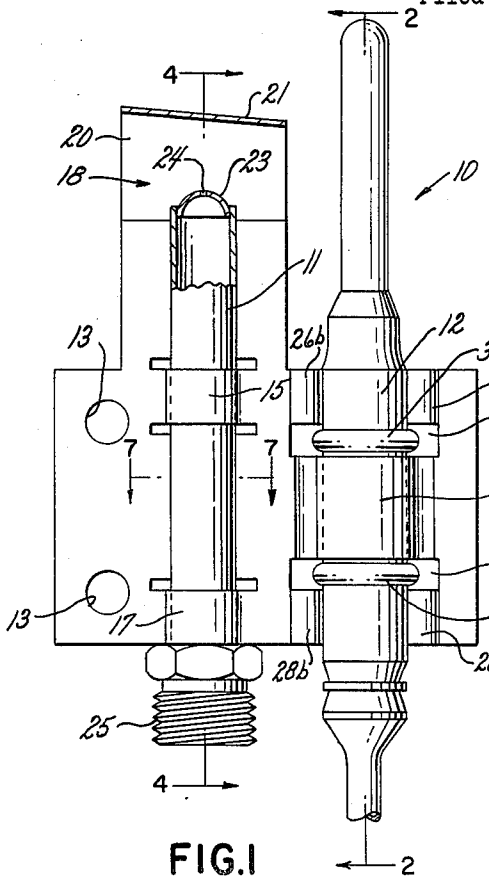


FIG. 1

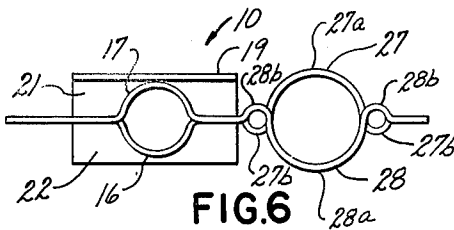


FIG. 6

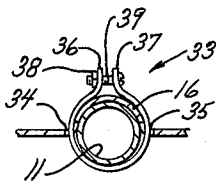


FIG. 7

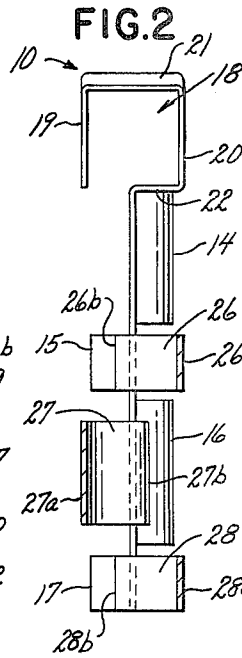


FIG. 2

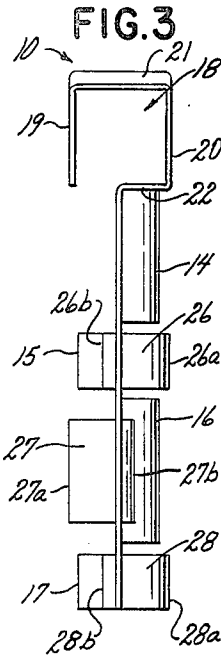


FIG. 3

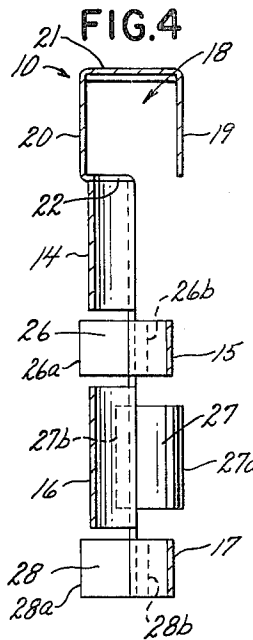


FIG. 4

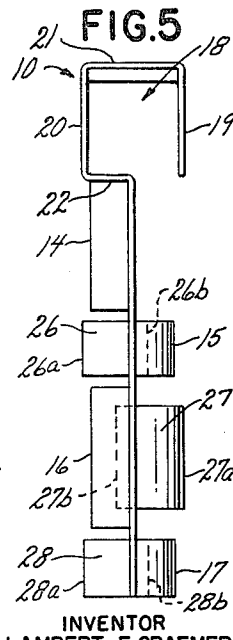


FIG. 5

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HOLDERS FOR PILOT BURNERS, THERMO- COUPLES AND THE LIKE

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This invention relates to improved holders for pilot burners, thermocouples and the like.

In particular, it has been found desirable to provide an improved holder for a pilot burner and a thermocouple whereby the holder can be readily attached to a gas fired apparatus, the pilot burner being adapted to not only ignite fuel issuing from a burner of the apparatus, but also being adapted to be sensed by the thermocouple and the like.

In such a system, it has been found that the pilot burner must be readily detachable from the holder so that repairs and replacement thereof can be easily and simply made in the field without detaching the holder. Further, it has been found that the thermocouple is not as readily susceptible to maintenance whereby the thermocouple can be more permanently mounted by the holder than the pilot burner.

Accordingly, it is an object to provide a holder of the above type having one or more of the novel features of this invention.

Another object of this invention is to provide such a holder that is inexpensive to manufacture and which requires relatively unskilled labor to install.

Other objects, uses and advantages of this invention are apparent from a reading of this description which proceeds with reference to the accompanying drawings forming a part thereof and wherein:

FIGURE 1 is a front view partially broken away, of the improved pilot burner and thermocouple holder of this invention.

FIGURE 2 is a cross-sectional view taken on line 2-2 of FIGURE 1 with the pilot burner and thermocouple removed.

FIGURE 3 is a right-hand end view of the holder illustrated in FIGURE 1 with the pilot burner and thermocouple removed.

FIGURE 4 is a cross-sectional view taken on line 4-4 of FIGURE 1 with the pilot burner and thermocouple removed.

FIGURE 5 is a left-hand end view of the holder of FIGURE 1 with the pilot burner and thermocouple removed.

FIGURE 6 is a bottom view of the holder of FIGURE 1 with the pilot burner and thermocouple removed.

FIGURE 7 is a fragmentary, cross-sectional view taken on line 7-7 of FIGURE 1 illustrating another embodiment of this invention.

While the various features of this invention are herein-after described as being utilized to form a pilot burner and thermocouple holder, it is to be understood that the various features of this invention can be utilized singly or in any combination thereof to provide any other type of holder or construction, as desired.

Therefore, this invention is not to be limited to only the embodiments illustrated in the drawings because the drawings are merely utilized to illustrate one of the wide variety of uses of this invention.

Referring now to FIGURES 1-6, the improved holder of this invention is generally indicated by the reference numeral 10 and is formed from a single flat blank, such as sheet metal or the like, suitably stamped in a manner hereinafter described to detachably hold a pilot burner 11

and a thermocouple 12 in the proper position relative to each other adjacent a conventional burner of a gas fired apparatus (not shown) so that the pilot burner 11 can ignite fuel issuing from such main burner of the apparatus when desired, the holder 10 being adapted to be mounted to the gas fired apparatus by suitable attaching bolts or the like passing through suitable apertures 13 formed in the holder 10 for such purpose.

The single flat blank forming the holder 10 is suitably stamped by conventional apparatus to define a first set of alternately directed and vertically aligned strap-shaped portions 14, 15, 16 and 17 each having a substantially semi-circular cross-sectional configuration and adapted to engage the outer peripheral surface of the substantially cylindrical pilot burner 11 disposed between the strap-shaped portions 14-17 in the manner illustrated in FIGURE 1.

Preferably, the strap-shaped portions 14-17 are so constructed and arranged that the same must be pushed slightly outwardly when the pilot burner 11 is inserted therebetween whereby the natural resiliency of the holder 10 causes the strap-shaped portions 14-17 to frictionally engage the outer peripheral surface of the pilot burner 11 and positively hold the pilot burner 11 to the holder 10.

However, the pilot burner 11 can be removed from the holder 10, when desired, by merely pulling vertically downwardly on the same with greater force than the force of the strap-shaped portions 14-17 tending to hold the pilot burner 11 in place.

In this manner, the pilot burner 11 can be readily replaced or repaired while the holder 10 is being utilized in the field.

The blank forming the holder 10 is suitably stamped to provide a flame chamber 18 above the set of strap-shaped portions 14-17 and having a substantially rectangular cross-sectional configuration as illustrated in FIGURES 2-5 and defined by a pair of opposed side walls 19 and 20 and a pair of opposed top and bottom walls 21 and 22.

The flame chamber 18 is so constructed and arranged, that the pilot burner is adapted to have the outlet end 23 thereof disposed in the flame chamber 18 when the pilot burner 11 is fully assembled to the holder 10 in the manner illustrated in FIGURE 1, the outlet end 23 of the pilot burner 11 having a suitable orifice 24 for directing fuel into the flame chamber 18 from a source of fuel interconnected to the coupling end 25 of the pilot burner 13 in a manner conventional in the art whereby the fuel mixes with air in the chamber 18 for subsequent combustion thereof.

The top wall 21 of the flame chamber 18 is angularly disposed relative to the pilot burner 11 whereby the left-hand end of the flame chamber 18 is substantially larger than the right-hand end thereof adjacent the thermocouple 12.

In this manner, the resulting pilot flame produced at the outlet end 24 of the pilot burner 11 will impinge on the top wall 21 and be divided into opposite directions whereby the larger portion thereof will issue out of the left-hand end thereof and ignite the fuel issuing from the main burner of the apparatus while the smaller portion of the pilot flame will be directed toward the thermocouple 12 to actuate the thermocouple 12 in a manner conventional in the art. Thus, a sufficient size pilot flame will always be produced by the holder 10 for igniting the burner apparatus.

The blank forming the holder 10 of this invention is suitably stamped to provide another set of alternately directed and vertically aligned strap-shaped portions 26, 27 and 28 each having a main intermediate section 26a, 27a, and 28a provided with a substantially semi-circular, cross-sectional configuration adapted to respectively en-

gage the outer peripheral surface of the substantially cylindrical thermocouple 12 when the thermocouple 12 is inserted between the strap-shaped portion 26-28.

As illustrated in FIGURE 6, each strap-shaped portion 26-28 has a pair of opposed end sections 26b-28b integrally interconnected to the main section 26a-28a thereof and reversely curving relative thereto, each end section 26b-28b having a substantially semi-circular cross-sectional configuration for a purpose hereinafter described.

The strap-shaped portions 26-28 are respectively separated from each other by elongated slots 29 and 30 adapted to respectively receive outwardly directed annular shoulders 31 and 32 formed on the thermocouple 12.

When it is desired to insert the thermocouple 12 between the strap-shaped portions 26-28 of the holder 10, the thermocouple 12 is inserted therebetween whereby the annular shoulders 31 and 32 cam the strap-shaped portions 26-28 outwardly as the same pass therethrough because the annular shoulders 31 and 32 are substantially larger than the main cylindrical body portion of the thermocouple 12 which is to be subsequently engaged by the main intermediate sections 26a-28a of the strap-shaped portions 26-28.

However, since each strap-shaped portion 26-28 is provided with the reversely curving end sections 26b-28b, the strap-shaped portions 26 and 28 can be temporarily deformed by the annular shoulders 31 and 32 of the thermocouple 12 as the same pass through the main sections 26a-28a of the strap-shaped portions 26-28 and will subsequently spring back to frictionally engage the main cylindrical body portion of the thermocouple 12 when the thermocouple 12 is disposed in the position illustrated in FIGURE 1.

Therefore, it can be seen that the strap-shaped portions 26-28 of the holder 10 are readily adaptable to positively hold the thermocouple 12 relative to the pilot burner 11 so that the flame issuing from the pilot burner 11 out through the right-hand end of the flame chamber 18 can readily actuate the thermocouple 12 which controls any suitable apparatus in a manner well known in the art.

Therefore, it can be seen that an improved holder 10 of this invention has been provided which will readily hold a pilot burner 11 and thermocouple 12 relative to the desired apparatus, the thermocouple 12 not being readily disconnected therefrom because of the annular shoulders 31 and 32 thereof while the pilot burner 11 is readily disconnectable therefrom for subsequent repairs and replacement in the field.

While the strap-shaped portions 14-17 of the holder 10 of this invention are sufficient to positively hold the pilot burner 11 in the proper position relative to the holder 10, it may be desired to utilize auxiliary fastening means which can be readily disconnected in the field to further hold the pilot burner 11 relative to the holder 10.

For example, one such clamping means is generally indicated by the reference numeral 33 in FIGURE 7 and is adapted to pass through suitable slot means formed in one of the strap-shaped portions 14-17 of the holder 10.

As illustrated in FIGURE 7, a pair of slots 34 and 35 are formed through the strap-shaped portion 16 to respectively receive the legs 36 and 37 of the C-shaped clamping member 33 so that the same can substantially encircle the pilot burner 11 and be tightened together by a nut and bolt arrangement 38 and 39 in a manner conventional in the art to more fully hold the pilot burner 11 relative to the holder 10.

While one type of clamping means 33 is illustrated in FIGURE 7, it is to be understood that other types of clamping means can be utilized because the clamping means 33 illustrated is merely exemplary of the various types of clamping means that can be utilized.

In this manner, the clamping means 33 can be readily disconnected in the field so that the pilot burner 11 can be repaired or replaced in the manner previously described.

Therefore, it can be seen that an improved holder for

pilot burners and thermocouples are provided by this invention whereby the pilot burners and thermocouples can be replaced in the field as desired.

Further, it can be seen that the improved holder of this invention can be formed in a relatively simple and relatively rapid manner from a single blank of material without requiring excessive machining operations and the like.

While the form of the invention now preferred has been disclosed as required by the statutes, other forms may be used, all coming within the scope of the claims which follow.

What is claimed is:

1. A pilot burner and thermocouple holder formed from a single flat blank of material suitably shaped to define a first set of alternately disposed and aligned strap-shaped portions each having a substantially semi-circular, cross-sectional configuration to press-fittingly engage substantially one-half of the outer peripheral circumference of a substantially cylindrical pilot burner inserted between said strap-shaped portions of said first set, and a second set of alternately disposed and aligned strap-shaped portions each having a substantially semi-circular cross-sectional configuration to press-fittingly engage substantially one-half of the outer peripheral circumference of a substantially cylindrical thermocouple inserted between said strap-shaped portions of said second set, said blank being shaped to provide a flame chamber above said first set of strap-shaped portions.

2. A holder as set forth in claim 1 wherein the adjacent strap-shaped portions of said second set thereof are separated by elongated slots.

3. A holder as set forth in claim 1 wherein each strap-shaped portion of said second set thereof has a pair of end sections reversely curving relative to the intermediate semi-circular section thereof.

4. In combination, a single flat blank of material suitably shaped to define first and second sets of alternately disposed and aligned strap-shaped portions each having a substantially semi-circular cross-sectional configuration, said blank being shaped to provide a flame chamber above said first set of strap-shaped portions, a substantially cylindrical pilot burner press-fittingly inserted between said strap-shaped portions of said first set and having substantially one-half of the outer peripheral circumference thereof engaged by each said strap-shaped portion, and a substantially cylindrical thermocouple press-fittingly inserted between said strap-shaped portions of said second set and having substantially one-half of the outer peripheral circumference thereof engaged by each said strap-shaped portion.

5. A pilot burner holder and the like comprising a flat blank of material having a set of alternately disposed and aligned strap-shaped portions each having a substantially semi-circular cross-sectional configuration to press-fittingly engage substantially one-half of the outer peripheral circumference of a substantially cylindrical pilot burner inserted between said strap-shaped portions, said blank being shaped to provide a flame chamber above said set of strap-shaped portions.

6. A pilot burner and thermocouple holder formed from a single flat blank of material suitably shaped to define a first set of alternately disposed and aligned strap-shaped portions each having a substantially semi-circular, cross-sectional configuration to press-fittingly engage substantially one-half of the outer peripheral surface of a substantially cylindrical pilot burner inserted between said strap-shaped portions of said first set, and a second set of alternately disposed and aligned strap-shaped portions each having a substantially semi-circular, cross-sectional configuration to press-fittingly engage substantially one-half of the outer peripheral circumference of a substantially cylindrical thermocouple inserted between said strap-shaped portions of said second set, said blank being shaped into an open ended flame chamber disposed

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above said first set of strap-shaped portions, said flame chamber having a substantially rectangular cross-sectional configuration.

7. In combination, a single flat blank of material suitably shaped to define first and second sets of alternately disposed and aligned strap-shaped portions each having a substantially semi-circular cross-sectional configuration, a substantially cylindrical pilot burner press-fittingly inserted between said strap-shaped portions of said first set of and having substantially one-half of the outer peripheral circumference thereof engaged by each said strap-shaped portion and a substantially cylindrical thermocouple press-fittingly inserted between said strap-shaped portions of said second set and having substantially one-half of the outer peripheral circumference thereof engaged by each said strap-shaped portion, said blank having elongated slots between adjacent strap-shaped portions of said second set thereof, said thermocouple having outwardly directed annular shoulders respectively received in said slots.

8. In combination, a single flat blank of material suitably shaped to define first and second sets of alternately disposed and aligned strap-shaped portions each having a substantially semi-circular cross-sectional configuration, a substantially cylindrical pilot burner press-fittingly inserted between said strap-shaped portions of said first set having substantially one-half of the outer peripheral circumference thereof engaged by each said strap-shaped portion, and a substantially cylindrical thermocouple press-fittingly inserted between said strap-shaped portions of said second set and having substantially one-half of the outer peripheral circumference thereof engaged by each said strap-shaped portion, one of said strap-shaped portions of said first set thereof having slot means formed therein, and a clamping means disposed in said slot means and engaging said pilot burner to hold said pilot burner to said blank.

9. In combination, a single flat blank of material suitably shaped to define first and second sets of alternately disposed and aligned strap-shaped portions each having a substantially semi-circular cross-sectional configuration, a substantially cylindrical pilot burner press-fittingly inserted between said strap-shaped portions of said first set and having substantially one-half of the outer peripheral circumference thereof engaged by each said strap-shaped portion, and a substantially cylindrical thermocouple press-fittingly inserted between said strap-shaped portions of said second set and having substantially one-half of the outer peripheral circumference thereof engaged by each said strap-shaped portion, each of said strap-shaped portions of said second set thereof having end sections reversely curving relative to the semi-circular intermediate section thereof.

10. In combination, a single flat blank of material suitably shaped to define first and second sets of alternately

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disposed and aligned strap-shaped portions each having a substantially semi-circular cross-sectional configuration, a substantially cylindrical pilot burner press-fittingly inserted between said strap-shaped portions of said first set and having substantially one-half of the outer peripheral circumference thereof engaged by each said strap-shaped portion, and a substantially cylindrical thermocouple press-fittingly inserted between said strap-shaped portions of said second set and having substantially one-half of the outer periphery circumference thereof engaged by each said strap-shaped portion, said blank forming an open ended flame chamber above said first set of strap-shaped portions and having a substantially rectangular cross-sectional configuration, the top wall of said flame chamber reducing the cross-sectional area in said chamber as said chamber nears said thermocouple.

11. A pilot burner holder and the like comprising a flat blank of material having a set of alternately disposed and aligned strap-shaped portions each having a substantially semi-circular cross-sectional configuration to press-fittingly engage substantially one-half of the outer peripheral circumference of a substantially cylindrical pilot burner inserted between said strap-shaped portions, said blank being shaped to provide a flame chamber above said set of strap-shaped portions, said flame chamber having a substantially rectangular cross-sectional configuration.

12. A pilot burner holder and the like comprising a flat blank of material having a set of alternately disposed and aligned strap-shaped portions each having a substantially semi-circular cross-sectional configuration to press-fittingly engage substantially one-half of the outer peripheral circumference of a substantially cylindrical pilot burner inserted between said strap-shaped portions, one of said strap-shaped portions having slot means formed therein to receive clamping means for holding said pilot burner to said blank.

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