April 28, 1936. J. A. MARTIN 2,038,749

GAS IGNITION MEANS

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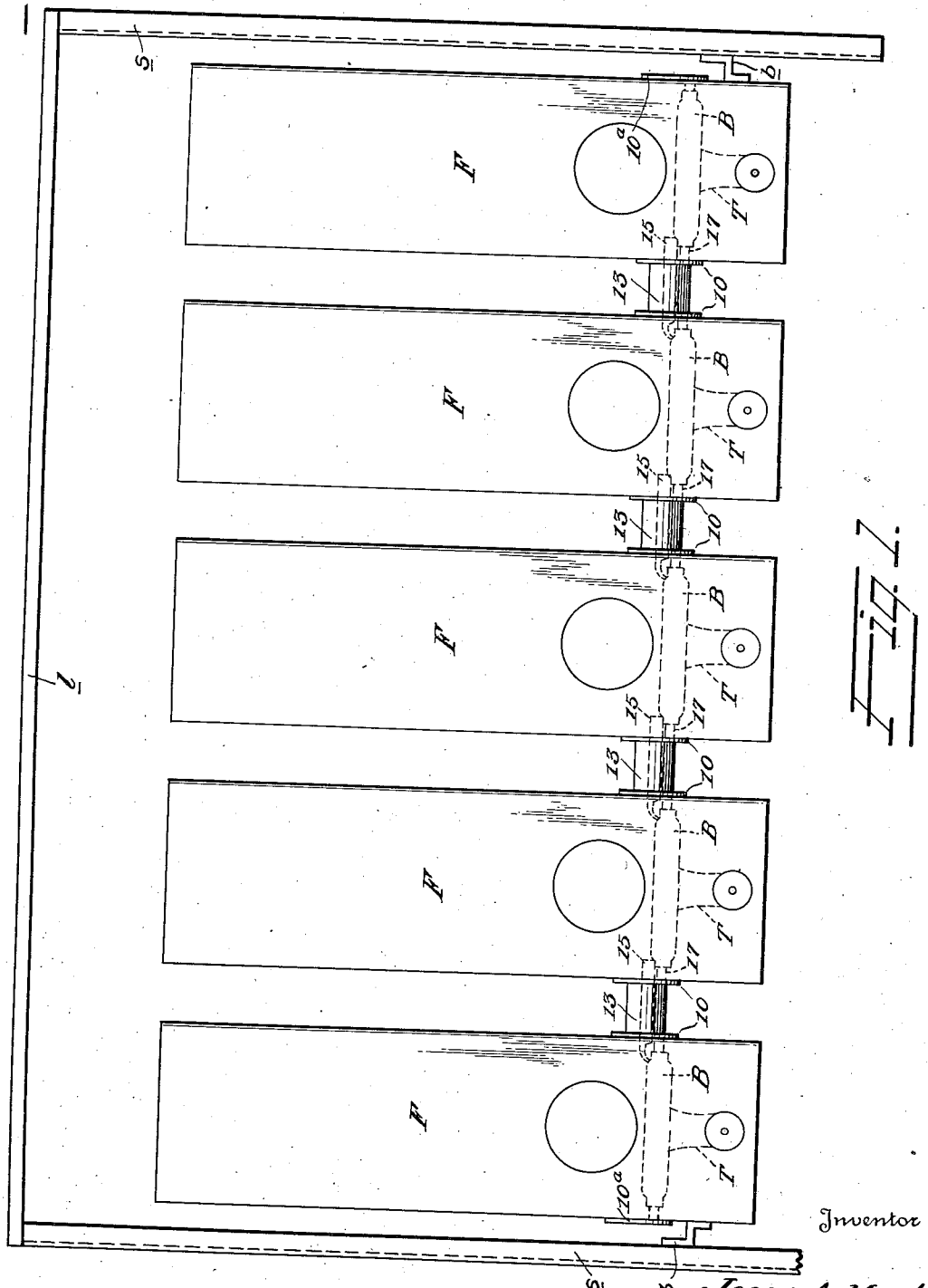


Fig. 1.

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Fig. 2.

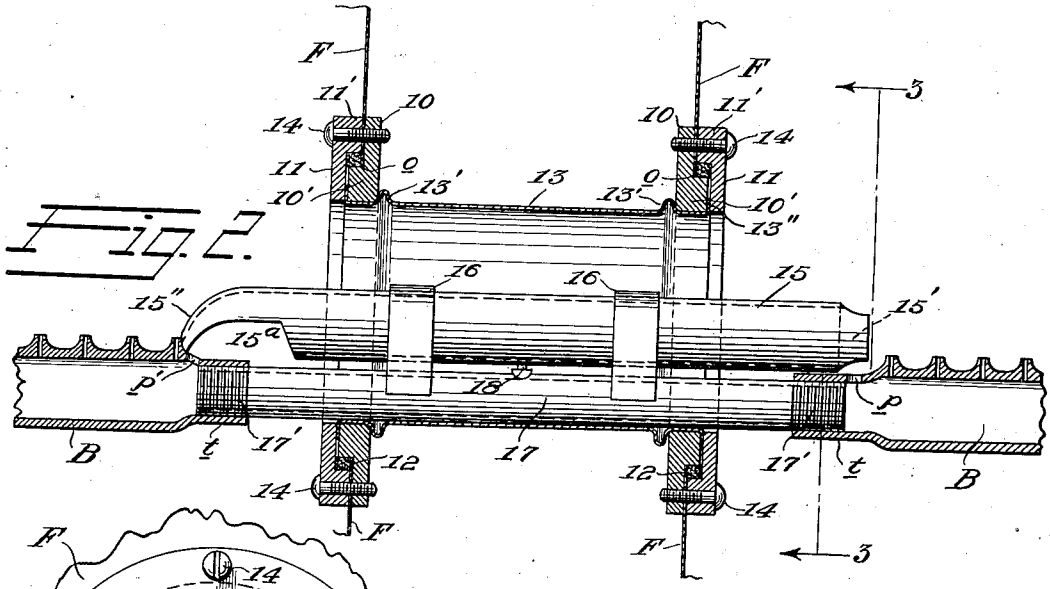


Fig. 3.

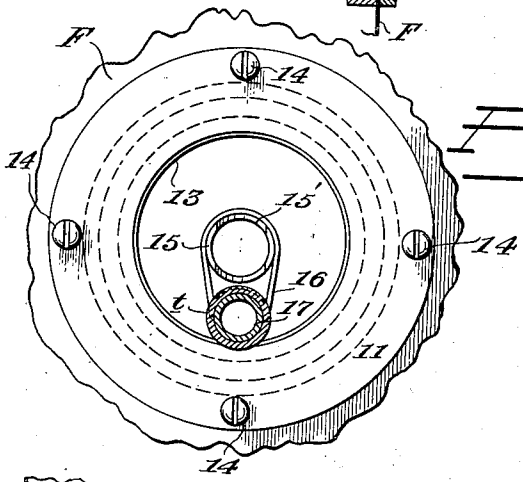


Fig. 5.

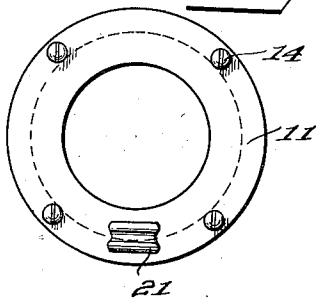
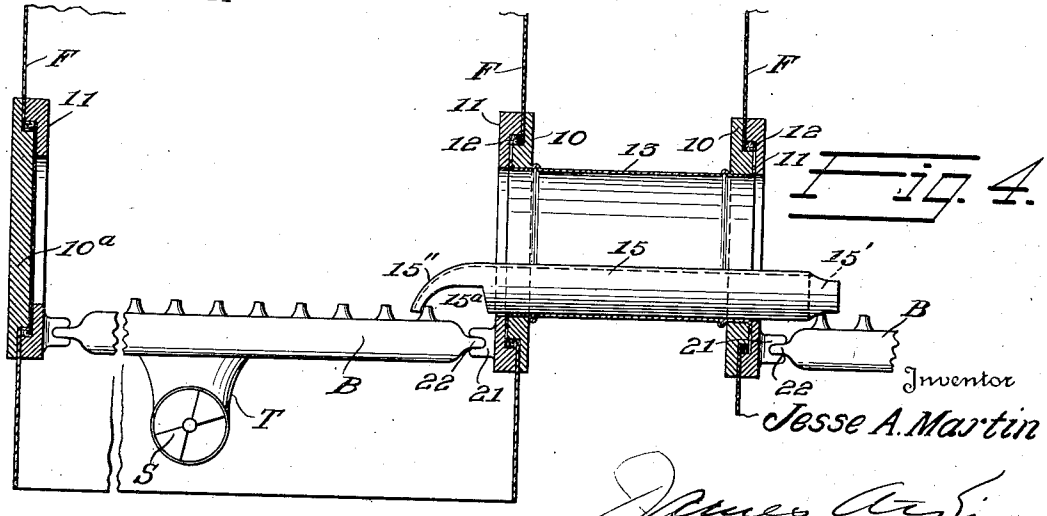


Fig. 4.



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GAS IGNITION MEANS

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9 Claims. (Cl. 158—115)

The present invention relates to gas ignition means.

More specifically, the invention relates to means for operative association with a gas burner or with a plurality of gas burners for effecting ignition of the gas from one burner by a remote pilot or by the ignited gas from another burner.

The means referred to while being well adapted to various uses is particularly adapted for operative association with gas furnaces whereby the gas burners in a battery of furnaces may be interconnected by such means to effect substantially instantaneous ignition of all the burners to which gas has been admitted from a single burner which has become ignited by a pilot of any suitable form common thereto.

A primary object of the present invention is the provision of an ignition or flasher tube for effecting ignition of gas from a burner by means of a flame at a point remote therefrom.

A further object of the invention is the provision of a flasher tube adapted for operative association with a pair of gas burners and which is so constructed as to effect ignition of the gas from either burner when the other burner has been ignited.

A still further object of the invention is the provision of a flasher tube having a lateral opening adjacent one end thereof for receiving a port in a gas burner and a gas deflecting wall adjacent the opening, the tube being axially open at the opposite end and having a diametrical channel in the open end for receiving a port in another gas burner. The tube being filled with combustible gas from the first burner for providing an ignition flame for either burner when the other burner has been ignited by a pilot common thereto, and the diametrical channel providing air-excluding walls on opposite sides of the port received therein whereby, when the second burner has become ignited by a pilot common thereto, the flame from the port within the channel will draw air through the tube and thus assist in the passage of combustible gas through the tube to be ignited by the flame from the adjacent burner and flash back through the tube to ignite the other burner.

A still further object of the invention is the provision of flasher tubes for interconnecting ports in gas burners of a plurality or battery of gas furnaces whereby when one of the burners has been ignited by a pilot associated therewith, the remainder of the burners will be substantially instantaneously ignited.

A still further object of the invention is the provision of flasher tubes for operative association with the burners in a plurality of gas furnaces, together with means for spacing the burners and supporting the flasher tubes, and means for spacing the furnaces and enclosing the flasher tubes.

With the above objects in view as well as others that will become apparent in the course of the following disclosure, reference is to be had to the accompanying drawings forming a part of such disclosure, and wherein—

Figure 1 is a front elevation of a battery of gas furnaces disclosing an application of the present invention.

Fig. 2 is a longitudinal sectional view of a connection between two of the furnaces embodying the features of the present invention, the view being on a larger scale than Fig. 1.

Fig. 3 is a transverse sectional view on planes represented by the broken line 3—3 in Fig. 2.

Fig. 4 is a view similar to Fig. 2 on a different scale and illustrating a modified construction.

Fig. 5 is a side view of one of the rings shown in Fig. 4.

Referring to the drawings by reference characters and wherein like characters designate like parts, the letter F (Fig. 1) designates each one of a battery of gas furnaces. Each of these furnaces is substantially rectangular in cross-section and is constructed of sheet metal, as is shown in Figs. 2 and 4. Each of the furnaces F is provided with a burner B which is supplied with gas through a Venturi tube T provided with suitable air shutters S (Fig. 4). The furnaces F are interconnected by means forming the subject-matter of the present invention and hereinafter described, while the opposite end furnaces are preferably connected by means of suitable brackets *b* to vertical angle iron supports *s* which are in turn connected at the upper ends thereof by means of a longitudinal member *l*.

In accordance with the present invention the burners B are interconnected by means later described for effecting ignition of all of the burners from a pilot common to one, and such means extend through the adjacent walls of the furnaces. The invention includes novel means for providing for the passage of the ignition means from one burner to another as well as providing a housing therefor and spacing means between the furnaces.

The opposite side walls of the furnaces F are cut out to provide circular openings *o* which receive the flanges 10' on outer rings 10 which engage the outer surfaces of the walls. Cooperat-

ing with each of the outer rings 10 is an inner ring 11 provided with a flange 11' which engages the inner surface of the respective wall and which is radially spaced from the flange 10' to provide a space for a cement gasket 12. Disposed within each pair of adjacent rings 10 is a spacing and concealing tube 13 which is provided with outwardly stamped projections 13' forming ring-engaging shoulders and whose opposite ends are spun over the inner sides of the flanges 10' as indicated at 13''. The rings are so formed that the walls of the furnaces F will lie between the body portions of rings 10 and the flanges 11', and the outwardly turned ends 13'' of the tube 13 will lie between the flanges 10' and the body portions of rings 11. The rings 10 and 11 are secured against opposite sides of the walls by means of bolts 14 which cause the rings to bind the gasket 12 as well as the outwardly flanged end 13'' of the tube 13. This construction provides a continuous passage through opposite walls of adjacent furnaces which is gas-tight, and the tube 13 also functions to properly space the furnaces.

The means for effecting ignition of either burner when the other has been ignited comprises a tubular member 15, one end of which is open axially of the tube and which end is provided with a diametrical channel, as indicated at 15', for effecting communication between the bore in the tube and a port p in the adjacent burner B. The opposite end of the tubular member 15 is closed axially thereof by a rounded gas-deflecting wall 15'' adjacent to which a lateral opening 15^a is provided for communication with a port p' in the adjacent burner B.

The tubular member 15 may be supported in any desired manner, but in a preferred arrangement it is provided with a pair of yokes 16 which are adapted for seating engagement with a burner spacing tube 17 which engages the bottom of the tube 13 and whose opposite ends are threaded as indicated at 17' for rigid detachable connection with interiorly threaded bosses t on the respective burners B. The tube 17 thus not only serves to support the member 15 but also functions as a burner-securing and spacing means. While the member 17 is disclosed as a tube, nevertheless it will be understood it may be a solid bar or rod and function equally as well.

The member 17 is preferably provided with a vertical projection or pin 18 adapted to engage and accurately fit an opening in the wall of member 15 for centering same or properly locating it with respect to the opposite burners B.

The member 15 may aptly be termed a "flasher tube", "explosion tube", "gas conveyor tube", etc., and functions in the following manner.

If the burner B at the right in Fig. 2 be provided with a pilot and the gas is ignited thereby, upon admitting gas to the burner B at the left through its Venturi tube T, some of the gas will pass through the port p' and the curved end 15'' of the tube will deflect the gas into the bore of the tube, thus subjecting it to the flame from the opposite burner B which will result in the gas in the tube becoming ignited and flashing back to ignite the gas escaping from the left-hand burner B. On the other hand, if the left-hand burner be provided with a pilot and the gas from such burner is ignited thereby, the flasher tube 15 will become filled with gas from the port p' prior to complete ignition of the gas from this burner due to a more or less remote location of the pilot, and when the flame reaches the port p' the gas in tube 15 will become ignited which will instantaneously ignite the gas from the right-hand burner. It is to be understood that gas is admitted to both burners simultaneously and that in the battery of furnaces as shown in Fig. 1 gas is admitted to all burners at the same time.

The specific construction of the flasher tube 15 renders same highly effective for providing an ignition flame to ignite gas from a burner adjacent either end thereof when a flame is applied at the opposite end thereof. While the gas for providing the ignition flame for either burner is admitted to the tube through the opening 15^a and from the burner adjacent thereto, the construction of the opposite end of the tube materially aids in the passage of the combustible gas through the tube for the reason that by the provision of the channel 15' the port p in the adjacent burner is positioned between laterally disposed arcuate walls which exclude air from opposite sides of this port, with the result that when the burner adjacent thereto has become ignited by a pilot common thereto the flame from the port p, due to the air-excluding walls, will draw some of the air necessary for combustion through the tube 15 and thus materially assist in the passage of gas from the other burner to be ignited by the flame from port p and then flash back through the tube to ignite the gas from the other burner as shown at the left in Fig. 2. The arcuate walls defined by the channel 15' also materially aid in confining the combustible gas to the flame from the port p to effect instantaneous ignition of the gas. It is to be understood, of course, that in the operation above described the gas is admitted simultaneously to both burners, either of which may be provided with a pilot.

From the above disclosure it will be appreciated that a flasher tube is provided in accordance with the present invention which unfailingly functions to ignite the gas from a burner disposed remotely to another burner which has become ignited regardless of which of the two burners is initially ignited.

It will further be appreciated that appropriate means are provided for supporting and housing the flasher tube, and while the housing and spacing tube 13 is illustrated as of considerable diameter in comparison with the flasher tube to facilitate assembly and dismounting of the flasher tube, nevertheless I do not confine myself to such relative proportions and may alter same as conditions may warrant.

As is illustrated in Fig. 1, a battery of furnaces F of an unlimited number may be connected by the means illustrated in Fig. 2 and hereinabove described for effecting ignition of all of the remaining furnaces when any one thereof has been ignited by a pilot common thereto.

It will be appreciated from the above disclosure that the flasher tube 15 is double acting, that is, it will function to ignite either burner with which it is in connection when the other has become ignited, and accordingly a single pilot of any preferred form may be provided in any one of the furnaces F either at the end or at the center of the battery and the remainder of the furnaces will be substantially instantaneously ignited from the flame of the burner ignited by such pilot upon admitting gas to the burners of the other furnaces.

The rings 10 in the outer walls of the end furnaces F are of disk formation, as indicated at 10^a in Fig. 4, for sealing the combustion chambers in these furnaces. Should it be desired to in-

crease the number of furnaces in the battery, the disks 10a are removed and rings 10 substituted therefor for providing tubes 13 between such furnaces and additional ones adjacent thereto, the supporting frame being adjusted accordingly. Furthermore, the number of furnaces in the battery may be expeditiously reduced when the rings 10 in the end furnaces of those remaining will be replaced by the disks 10a.

In Figs. 4 and 5 is illustrated a modified arrangement wherein the supporting and spacing tube 17 is omitted and the flasher tube 15 is supported on the bottom of the housing and spacing tube 13 with the opposite ends thereof in communication with respective ports of the burners B.

Since the tube 17 is not utilized in this form of the invention, other means are provided for holding and spacing the adjacent burners B. Such means preferably comprise bifurcated lugs 21 integral with or suitably secured in rigid relation with the rings 11, and cooperating with such lugs are projections or tongues 22 formed on the burners B. Any suitable means may be provided to hold the tube 15 in fixed position relative to the burners B.

Other means than those illustrated may be provided for holding the flasher tube in operative position. As an example, the burners may be provided with suitable recesses for nesting the tubes in operative relation to ports in the burners.

While I have disclosed the flasher tubes in operative association with gas furnaces, and to which they are specially adapted, they may be utilized to good advantage in many other ways. Thus, the flasher tubes disclosed may be utilized between a plurality of burners in an open fire box, between a plurality of burners in the open air, or a single flasher tube can advantageously be used as a means for igniting burners disposed in an inaccessible position by introducing it through the wall of the furnace at a suitable point and applying a flame from any source to its protruding end.

The construction and operation of the flasher tube 15 are such as to positively ignite one burner from an adjacent one without failure. It is to be particularly noted that the small quantity of gas utilized to produce the ignition flash in the tube is always obtained from the burner adjacent the curved end 15'' of the tube, the gas passing from port p' through the tube and being ignited at the open end of the tube when the burner adjacent thereto is ignited and then flashing back through the tube to ignite the gas from the burner adjacent the curved end when gas is admitted thereto. On the other hand, when the burner adjacent the closed end of the tube is first ignited some gas therefrom collects in the adjacent end of the tube under the curved end portion and becomes ignited and flashes through the tube to ignite the gas from port p in the other burner upon gas being admitted thereto. In other words, when one burner is ignited gas passes through the tube, becomes ignited and flashes back to ignite the other burner, while when the other burner is ignited gas therefrom is ignited in the tube and flashes therethrough to ignite the first burner.

While I have disclosed preferred specific embodiments of my invention, the same are to be considered as illustrative only and not restrictive, since various changes in form, proportions, etc., may be resorted to as fairly fall within the scope of the subjoined claims.

What I claim and desire to secure by Letters Patent is:—

1. Means for igniting gas from a remote flame comprising a tube, the tube being open axially at one end thereof, a diametrical channel in the open end, the opposite end of the tube being axially closed by a rounded gas deflecting wall, and a lateral opening in the tube adjacent the rounded gas deflecting wall.

2. In combination with a plurality of gas furnaces each provided with a gas burner, a housing and supporting member disposed between the furnaces of each pair thereof and communicating with the interiors thereof adjacent the respective burners, a gas conducting member disposed within each of said housings and supporting members with the opposite ends thereof adjacent the respective burners for effecting ignition of either burner from a flame on the other burner, and means supported by said housing and supporting members for supporting and spacing said burners.

3. In combination with a pair of gas burners, a flasher tube for igniting one burner from a flame on the other burner, the flasher tube comprising an elongated member having a bore axially thereof, one end of the tube being open axially thereof and provided with a diametrical channel to receive a port in either of said burners, the opposite end of the tube being provided with an arcuate gas-deflecting wall, and a lateral opening adjacent said wall for receiving a port in the other of said burners.

4. In combination with a pair of gas furnaces each provided with a gas burner, means for collecting gas from one of said burners and bringing it into communication with a flame on the other burner for igniting the gas from the first burner, said means comprising a tubular member extending through the adjacent walls of said furnaces and communicating with the burners therein, and means for spacing said furnaces and housing said first means.

5. In a construction as defined in claim 4 wherein said spacing and housing means comprises an inner and an outer ring engaging opposite faces of the wall of each of said furnaces, a tubular member spanning the space between the furnaces and having the opposite ends thereof engaged between said inner and outer rings, and means for clamping said rings in binding engagement with said walls and the ends of said tubular member.

6. A construction as defined in claim 4 together with means for spacing said burners and supporting said first means.

7. In combination with a pair of heating chambers having openings in adjacent walls thereof and a burner in each chamber, of a housing and spacing tube connecting the walls at the margins of the openings, means for spacing said burners longitudinally of the tube, means for admitting gas to both of said burners, and means disposed within said tube for collecting gas from one of the burners to provide an ignition flame for either burner from a flame on the other burner.

8. The construction defined in claim 7, wherein said first means comprises an elongated member extending through said tube and having the opposite ends thereof in rigid and detachable engagement with the burners.

9. The construction defined in claim 7, wherein said first means comprises a bracket adjacent each end of the tube provided with a recess to receive a tongue on the burner adjacent thereto.

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