Sept. 9, 1930. O. E. KLOCKMAN 1,775,494

COKE OVEN GAS CONNECTION

Filed July 8, 1925 2 Sheets-Sheet 1

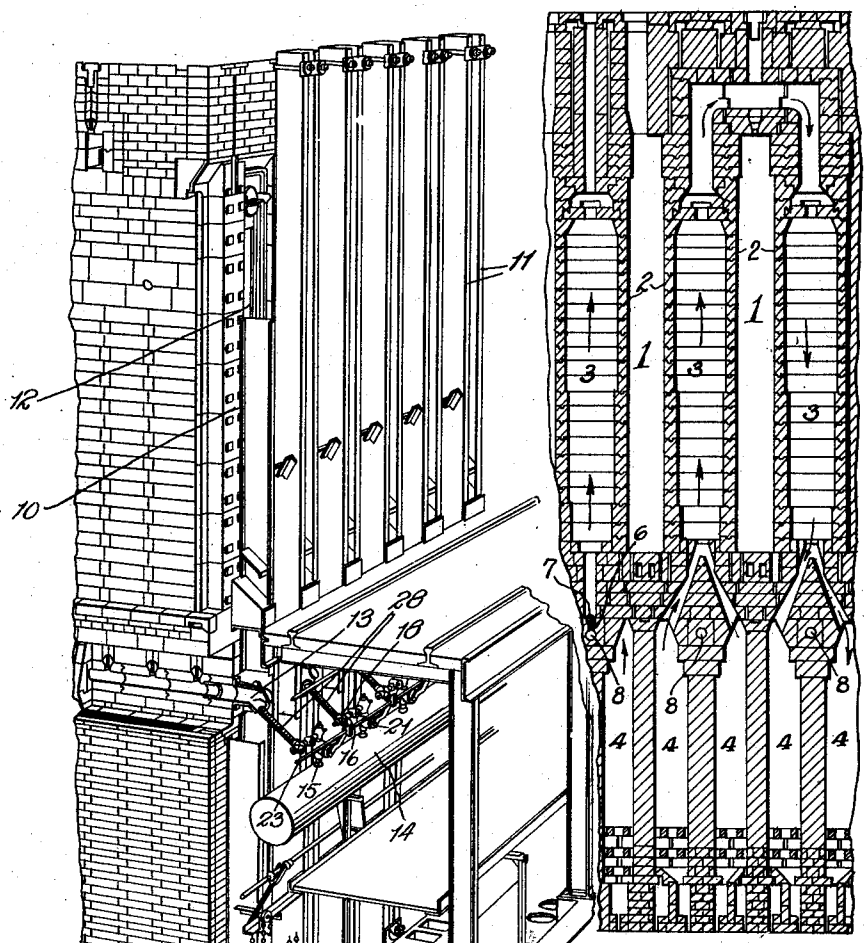


Fig. 4.

Fig. 1.

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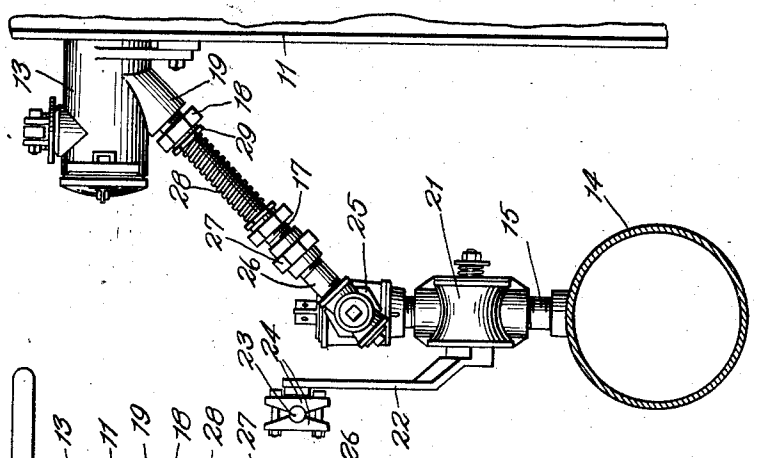


Fig. 2.

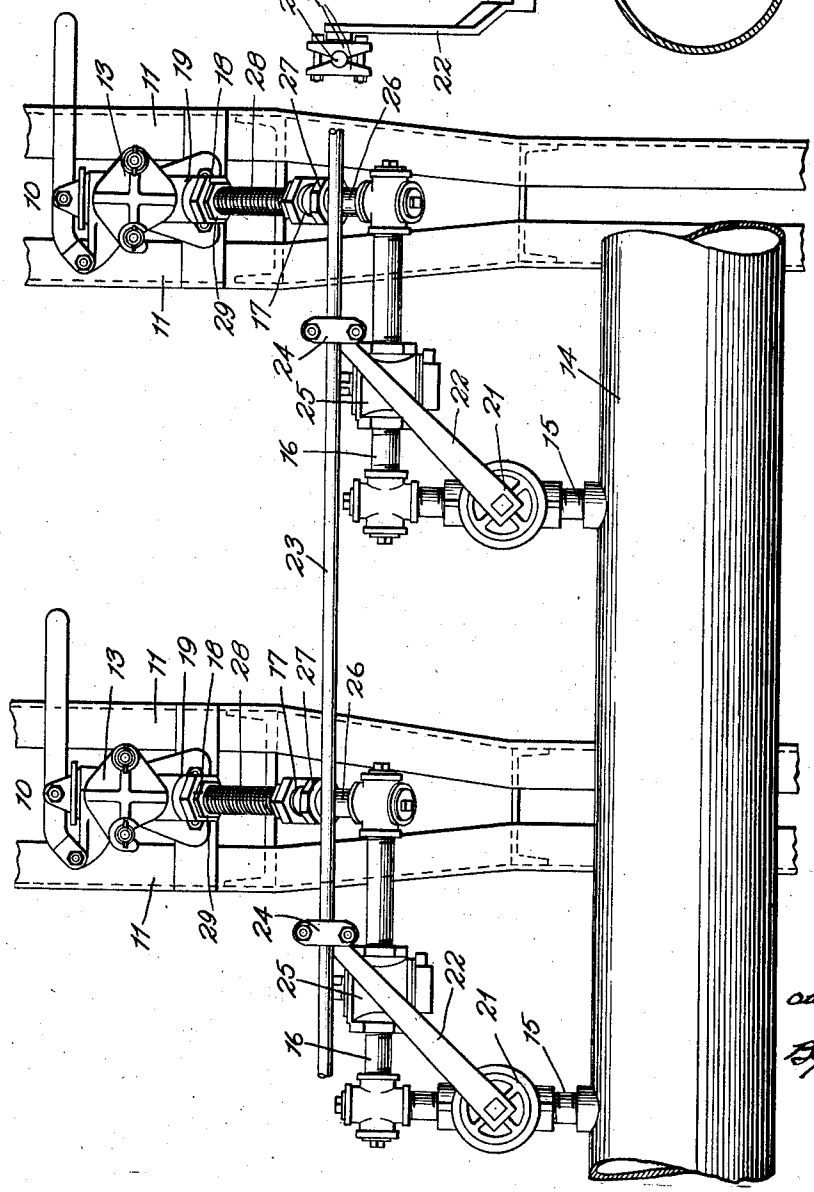


Fig. 3.

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UNITED STATES PATENT OFFICE

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COKE OVEN GAS CONNECTION

Application filed July 8, 1925. Serial No. 42,188.

This invention relates in general to improvements of general utility in the coking retort oven art and more particularly to improvements in the connections between the fuel gas main and the individual gas guns for the heating walls.

Objects of the invention are the provision of a connection, through which the fuel gas may flow from the longitudinally extending gas main to the gas guns of the individual transversely extending heating walls of a battery of coking retort ovens, that will accommodate the differences resulting in temperature differentials or longitudinal vertical and transverse expansion and contraction of the battery or its associated parts, and thereby prevent straining of the connections and leakages through the joints and the valves, the provision of a flexible connection which is inexpensive, lasting, and readily and easily assembled between the gas main and gas gun, and such other objects and advantages of the invention as may be found to obtain in the structure hereinafter set forth and claimed.

In the accompanying drawings, forming a part of this specification, and showing, for purposes of exemplification, a preferred form and manner in which the invention may be embodied and practiced, but without limiting the claimed invention specifically to such illustrative instance or instances:

Fig. 1 is a front perspective view showing an embodiment of the invention in connection with a portion of a fuel gas main and a portion of a battery of coking retort ovens having gas connections therebetween.

Fig. 2 is a side elevational view of the same, parts being shown in section.

Fig. 3 is a front elevational view of a battery of coke ovens embodying the invention.

Fig. 4 is a vertical sectional view taken on Fig. 1, longitudinally of the battery of Fig. 1.

In its present embodiment, the invention is incorporated in a coke oven battery of the by-product type, and for convenience the present description will be confined to this use of the invention. The features of the invention are, however, readily susceptible of other uses, for example, in connection with coke oven batteries of other form, hence it is manifest that the scope of the invention is by no means confined to the specific use and specific embodment herein described.

Referring to the drawings, there is shown a portion of the front of a coke oven battery of the by-product type, which embodies in its construction a plurality of coking chambers 1 arranged side by side, and running transversely of the battery, and having the usual transversely extending alternating heating walls 2 intermediate adjacent coking chambers, said heating walls being provided with the usual vertical flame flues 3 for generating heat to coke the charges of coal in the coking chambers. The heating walls extend vertically to the top of the coke oven battery, said top being of usual construction, and facing the end of each heating wall is a jamb 10, the outer face of which is braced by a pair of vertical buckstays 11. Each end of the coking chambers is sealed by usual coke oven doors 12. Regenerators 4, arranged transversely of the battery below the level of the coking chambers and heating walls, communicate with the heating flues of their companion heating walls by means of the usual short ducts or ports 5 and function to take up the heat of the gases outflowing from the heating walls and impart such heat to the outside air in-flowing through the regenerators to the heating flues to augment the flame temperature of the gas burning in the heating flues in which combustion is taking place.

The inlets to the heating flues or flame flues are located at their respective bottoms and at each inlet there is provided a short fuel gas duct 6 equipped with a suitable gas nozzle 7, through which the inflowing fuel gas passes into the heating flues. Extending transversely of the battery from the opposite sides of the coking plant or battery are gas channels 8, there being a pair of such channels arranged approximately end to end for each heating wall.

Communicating with the inlets of the gas channels on opposite sides of the coke oven battery are gas guns 13; the series of gas guns 13 on each side of the battery are supplied with fuel gas from the usual fuel gas

main 14 extending longitudinally along each side of the battery. Connected with said main 14 is a series of supply pipes 15 respectively leading to branch pipes or conduits 16 communicably connected with their respective gas guns 13 by a conduit 17 coupled at 18 to an inlet 19 of the gas gun. In each of the supply pipes 15 is provided a reversing gas cock 21 moved by an operating lever 22 which is connected with an operating rod 23, common to the series of reversing gas cocks, by clamps 24. In each of the branch pipes or conduits 16 is provided a regulating cock 25, which regulates the amount of gas flowing therethrough. By reason of the fluctuation in temperature of the battery these pipes and the valves contained therein have been subject to strains causing the joints to weaken and at times to leak. In order to prevent such strains and to compensate for temperature differentials and the expansion and contraction of the plant in longitudinal, vertical and transverse directions of the battery, there is provided a flexible conduit between the gas main and the individual gas guns. As shown in the present instance, the conduit 17, consists of a metallic pipe 26, coupled at 27 to reinforced metallic flexible hose or conduit 28 which is coupled at 29 to the inlet 19 by coupling 18. The reinforced metallic hose or conduit advantageously may be of the usual kind for conveying fluids under pressure which has been reinforced or armored by curvilinear metal such as by laminations or windings of metal on the outer surface, or on the inner surface, or embedded in material forming the hose or conduit. Such a flexible connection provides a gas tight communication between the branch pipe 16 and the gas gun 13, and is capable of accommodating any temperature differentials or longitudinal, vertical or transverse expansion or contraction of the battery or associated elements resulting from fluctuations in temperatures and prevents leakages resulting from straining of the parts by reason of temperature differentials and fluctuations or from slight irregularities in spacing or misfitting of the conduits and their couplings.

The invention as hereinabove set forth is embodied in a particular form of construction but may be variously embodied within the scope of the claims hereinafter made.

I claim:

1. The combination with a coking retort oven masonry-structure comprising a series of alternate coking chambers and flued heating walls therefor arranged laterally of each other in a row and having a gas conduit extending from the exterior of the oven-structure into the masonry-structure of each of said heating walls and communicating with the flues of said heating walls, the gas conduits being permanently arranged within the masonry in fixed relation to said heating walls and including a rigid metallic gas-gun terminating adjacent the external surface of the masonry structure; and a gas main mounted externally of said oven-structure for feeding fuel gas to said gas conduits, a plurality of reversing gas valves each individual to one of said gas-guns for controlling gas flow thereto from said gas main and a reversing means common to a plurality of said reversing valves; of a plurality of gas conducting means communicably connecting said reversing valves with the gas conduits, each of the gas conducting means comprising a flexible connection between the reversing valves and the gas-guns adapted to yield when said gas conducting means is subjected to thrusts, and to accommodate creeping of said gas conduits lengthwise of said row due to expansion of said masonry-structure.

2. The combination with a coking retort-oven masonry-structure comprising a coking chamber, a heating wall therefor disposed laterally thereof and having combustion chamber-means therein; a gas conduit extending from the exterior of the oven into the masonry-structure of said heating wall and communicating with said combustion chamber-means, said conduit being permanently arranged within the masonry-structure in fixed relationship with said heating wall and including a metal end section terminating adjacent the external surface of the masonry-structure; and a gas main mounted externally of said retort oven for feeding fuel gas to said gas conduit: of gas conducting-means communicably connecting said gas main with said gas conduit comprising a flexible connection between the gas main and the metal end section adapted to yield when the gas conducting-means is subjected to thrusts, and to accommodate creeping of said gas conduit laterally of the coking chamber and heating wall due to expansion of the masonry-structure.

3. The combination with a coking retort-oven masonry-structure comprising a coking chamber, a heating wall therefor disposed laterally thereof and having combustion chamber-means therein; a gas conduit extending from the exterior of the oven into the masonry-structure of said heating wall and communicating with said combustion chamber-means, said conduit being permanently arranged within the masonry-structure in fixed relationship with said heating wall and including a metal end section terminating adjacent the external surface of the masonry-structure; and a gas main mounted externally of said retort-oven for feeding fuel gas to said gas conduit: of gas conducting-means communicably connecting said gas main with said gas conduit comprising a flexible metal-armored gas conduit between the gas main and the metal end section adapted to yield

when the gas conducting-means is subjected to thrusts, and to accommodate creeping of said gas conduit laterally of the coking chamber and heating wall due to expansion of the masonry-structure.

In witness whereof I have hereunto set my hand.

OTTO E. KLOCKMAN.