April 11, 1939. G. J. JACKSON 2,154,166

UNDERJET-FIRED COKE OVEN

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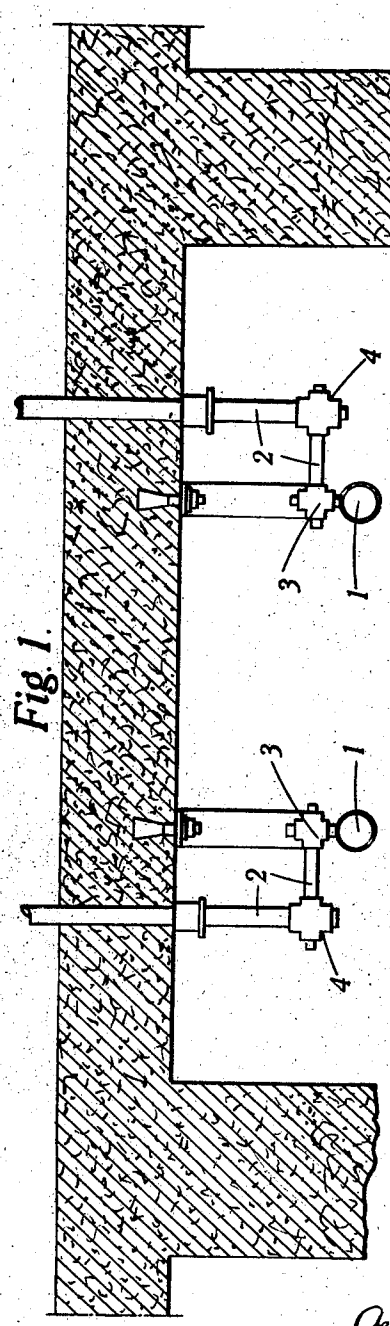


Fig. 1.

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Fig. 4.

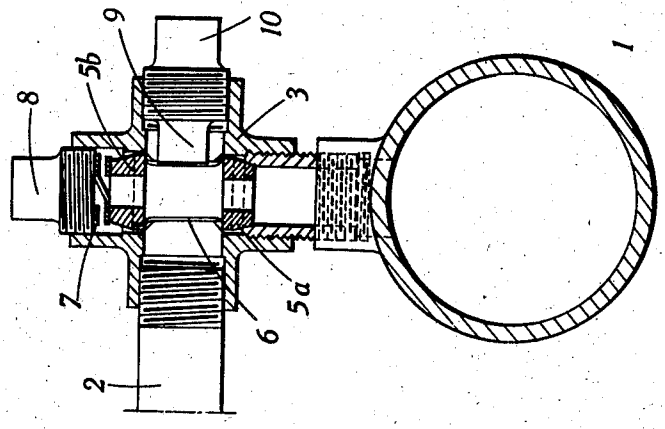


Fig. 2.

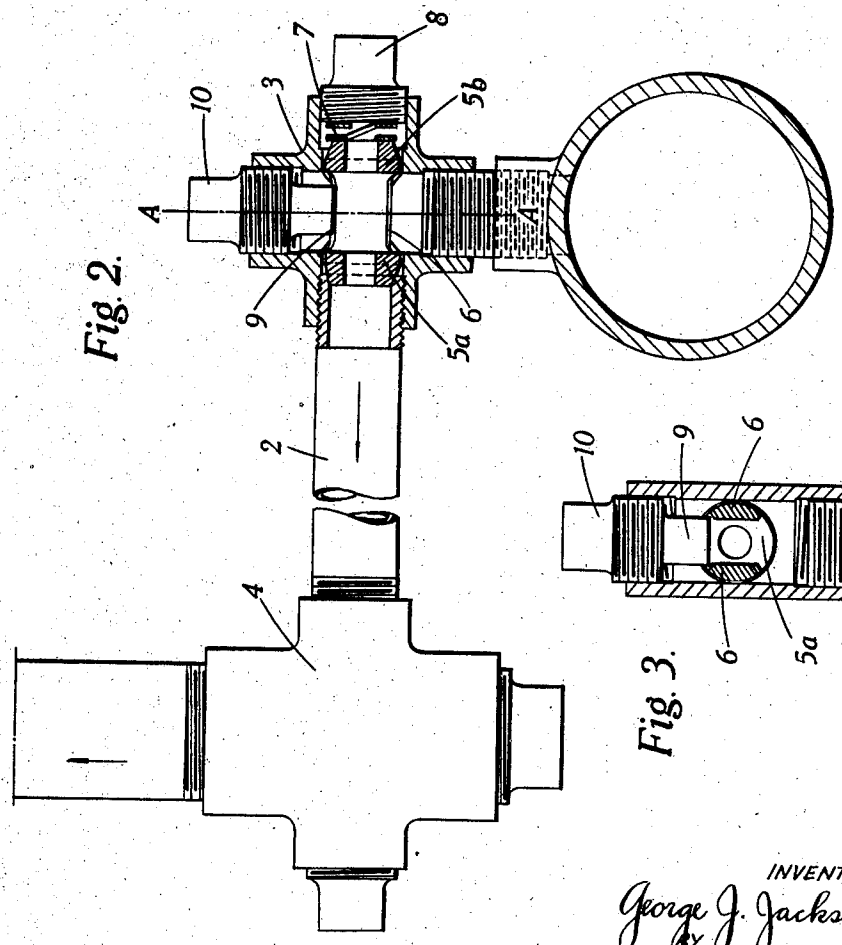


Fig. 3.

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UNDERJET-FIRED COKE OVEN

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Application March 10, 1937, Serial No. 130,167
In Great Britain April 27, 1936

3 Claims. (Cl. 138—44)

The present invention relates to improvements in the control of the supply of fuel gas to the heating flues of underjet-fired coke-ovens.

The fuel gas is supplied to the individual heating flues through branch pipes fed from a fuel gas supply main or header. It is necessary, in order to control the heating in the various flues, that the quantity of gas supplied to each branch pipe shall be accurately adjusted, and, moreover, it is necessary that provision shall be made for accurately varying the quantity of fuel gas supplied to any branch pipe.

The variation and adjustment of the amount of gas supplied by a branch pipe cannot properly be controlled by an adjustable valve, and one method frequently adopted is to provide a joint in the branch pipe, between the two parts of which joint is inserted a plate containing a calibrated aperture. The supply of fuel gas through each individual branch pipe can then be varied by inserting a plate having an aperture of the appropriate size. This method is not entirely satisfactory in practice, and it is the object of the present invention to provide a more convenient method of adjusting the quantity of gas supplied through a branch pipe.

An arrangement has also been proposed in which the area of a fixed circular nozzle in a horizontal branch pipe is varied by inserting rods having different and chosen diameters. A crescent-shaped aperture is thus produced between the nozzle and the rod, which has the disadvantage that deposits from the fuel gas are liable to form in the spaces where the gap is small, thus producing partial blockage of the aperture, and a change in the calibration thereof. In order to minimise the risk of obstruction of the calibrated aperture, its form should always be circular.

According to the present invention, I provide an arrangement for controlling the fuel gas supplied to the heating flues of underjet-fired coke-ovens, in which the fuel gas is conveyed to the heating flues through branch pipes connected directly to a fuel gas main and means are provided permitting the insertion of an interchangeable nozzle plug containing a calibrated aperture, in the path of the gas through the branch pipe, without breaking the connection between the branch pipe and the fuel gas main, the nozzle plug, when inserted, being held positively in position.

Preferably, the nozzle plug is formed as a double-ended unit comprising two calibrated nozzle-elements (each containing a central, circular calibrated aperture) joined by spacing members, which spacing members are arranged so as not to obstruct the gas-flow through the nozzle-element which is in use.

The manner of carrying the present invention into practical effect is more particularly described with reference to the accompanying drawings, in which:

Figure 1 shows the disposition of the fuel gas mains in relation to the branch pipes supplying fuel gas to the burners in the heating flues of a coke-oven;

Figure 2 is a part-sectional elevation showing the position of the nozzle plug;

Figure 3 is a sectional elevation on the line A—A of Figure 2; and

Figure 4 is a modified arrangement, corresponding to Figure 2, in which the nozzle plug is arranged vertically instead of horizontally.

Referring to Figure 1, the gas mains 1 are arranged in a passage beneath a coke-oven, and to each main 1 are connected a plurality of branch pipes 2 through which fuel gas is supplied to the burners in the individual heating flues. The calibrating device which forms the subject of the present invention controls the amount of fuel gas supplied to the burner, and is preferably positioned in the cross fitting 3, but alternatively may be positioned in the cross fitting 4.

Referring to Figures 2 and 3, the branch pipe 2 is connected to the fuel gas main 1 through the cross pipe fitting 3, which latter has four branches at right angles, to two adjacent branches of which are connected the fuel gas main 1 and the branch pipe 2. The calibrated nozzle plug comprises two nozzle elements 5a and 5b containing central, circular, calibrated apertures, the two elements 5a and 5b being joined by distance pieces 6, as shown in Figure 3. The seating 7 for the nozzle plug is preferably conical, the cooperating surface on the nozzle plug also having a conical form.

The nozzle plug is inserted and removed through the branch of the cross pipe fitting 3 opposite to the branch pipe connection, and seats in the connection to the branch pipe 2. The nozzle plug is maintained in position on its seating by means of the screwed stopper 8 and the spring washer 7 bearing against the end of the nozzle plug which is not in use.

In order to prevent the nozzle plug turning when the stopper 8 is screwed in, whereby the distance pieces 6 might obstruct the opening to the fuel gas main 1, a stop 9 is provided on the plug 10 which closes the fourth branch of the cross pipe fitting 3. As shown in Figure 3, the stop 9 projects a short way into the space between

the two distance pieces 6, and so prevents the nozzle plug from turning.

In the modification shown in Figure 4, the nozzle plug is arranged vertically, and seats on the connection of the cross pipe fitting 3 to the fuel gas main 1, and is inserted and removed through the opposite branch of the cross pipe fitting. In other respects, the arrangement is similar to that of Figure 2.

Instead of a double-ended unit, the nozzle plug may consist of a single nozzle-element such as 5*a* or 5*b*, with a suitable distance piece attached thereto.

The arrangement of the present invention has the advantage that a nozzle plug can be changed quickly and conveniently, either by reversing the nozzle plug or by changing it for another, without breaking the branch pipe connections. Moreover, the present invention has the advantage that the circular form of the calibrated aperture is preserved, thereby avoiding the risk of partial obstruction by deposits from the fuel gas, while the fuel gas is uniformly distributed in the branch pipe.

What I claim is:

1. For controlling the supply of fuel gas to the heating flues of underjet-fired coke-ovens, a double-ended nozzle plug unit, comprising two nozzle-elements, each containing a calibrated aperture, spaced apart by distance pieces, and adapted to be inserted in a cross pipe fitting between a fuel gas main and a branch pipe conveying fuel gas to said heating flues.

2. Arrangement for adjusting the supply of fuel gas to the heating flues of underjet-fired coke-ovens, comprising a fuel gas main, a branch pipe conveying fuel gas to a heating flue, a pipe connecting member having four branches at right angles, to two adjacent branches of which connecting member are connected said fuel gas main and said branch pipe, and an interchangeable nozzle-element containing a calibrated aperture, said nozzle-element being inserted into said connecting member through one of the remaining branches thereof, in the path of the fuel gas so that the flow of the fuel gas is through said calibrated aperture, and means removably inserted in each of the said remaining branches of the connecting member to close the same and to hold said nozzle-element positively in position without obstructing the flow of the fuel gas.

3. Arrangement for adjusting the supply of fuel gas to the heating flues of underjet-fired coke-ovens, comprising a fuel-gas main, a branch pipe conveying fuel gas to a heating flue, a cross pipe fitting having four branches at right angles, to two adjacent branches of which cross pipe fitting are connected said fuel gas main and said branch pipe, an interchangeable nozzle plug comprising two nozzle-elements each containing a calibrated aperture and spaced apart by distance pieces, inserted into said cross pipe fitting through one of the remaining branches thereof and so placed in said cross fitting that the fuel gas flows through one of said calibrated apertures and between the said distance pieces, means inserted in the latter branch of said cross pipe fitting to close the same and to hold the nozzle plug positively in position therein, and means inserted in the fourth branch of said cross pipe fitting to close the same and to hold said distance pieces out of the path of the fuel gas.

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