June 11, 1940. W. SCHMIDT 2,203,698

COKE OVEN CHARGING-HOLE CLOSURE CONSTUCTION

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Fig. 1

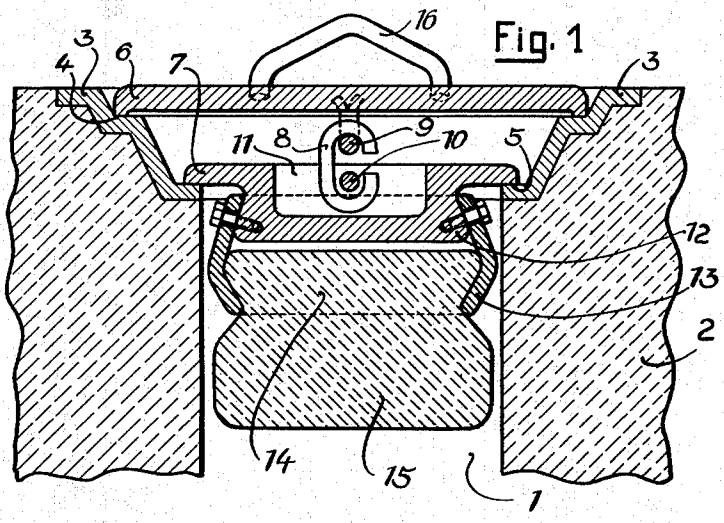
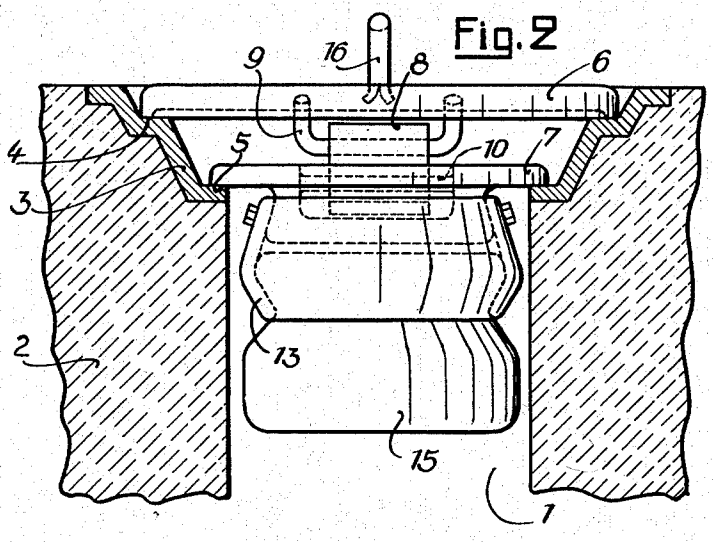


Fig. 2



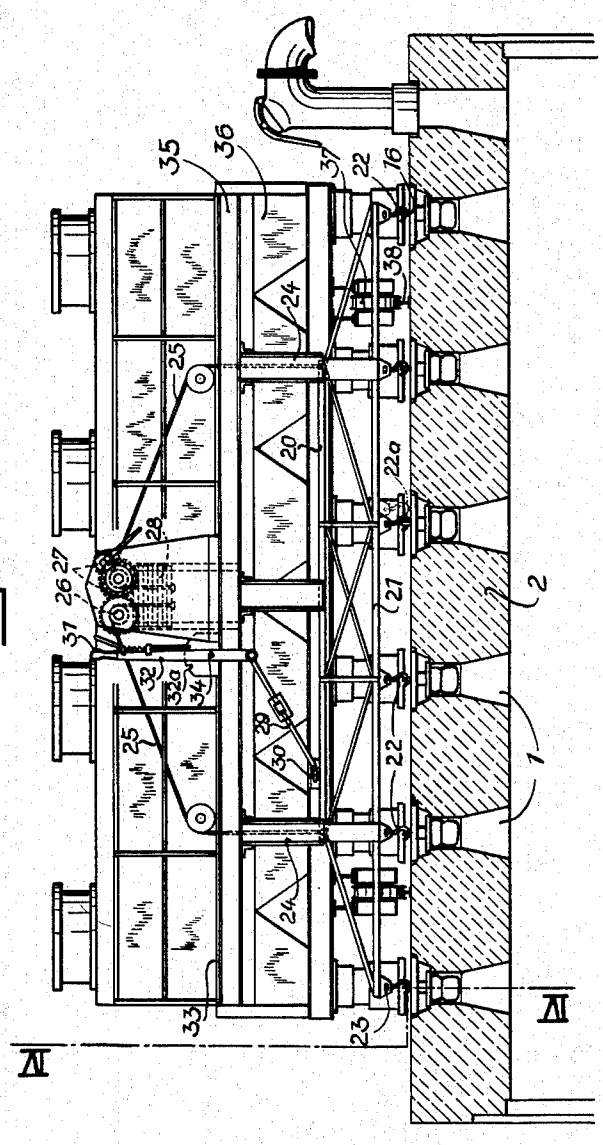
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Fig. 3



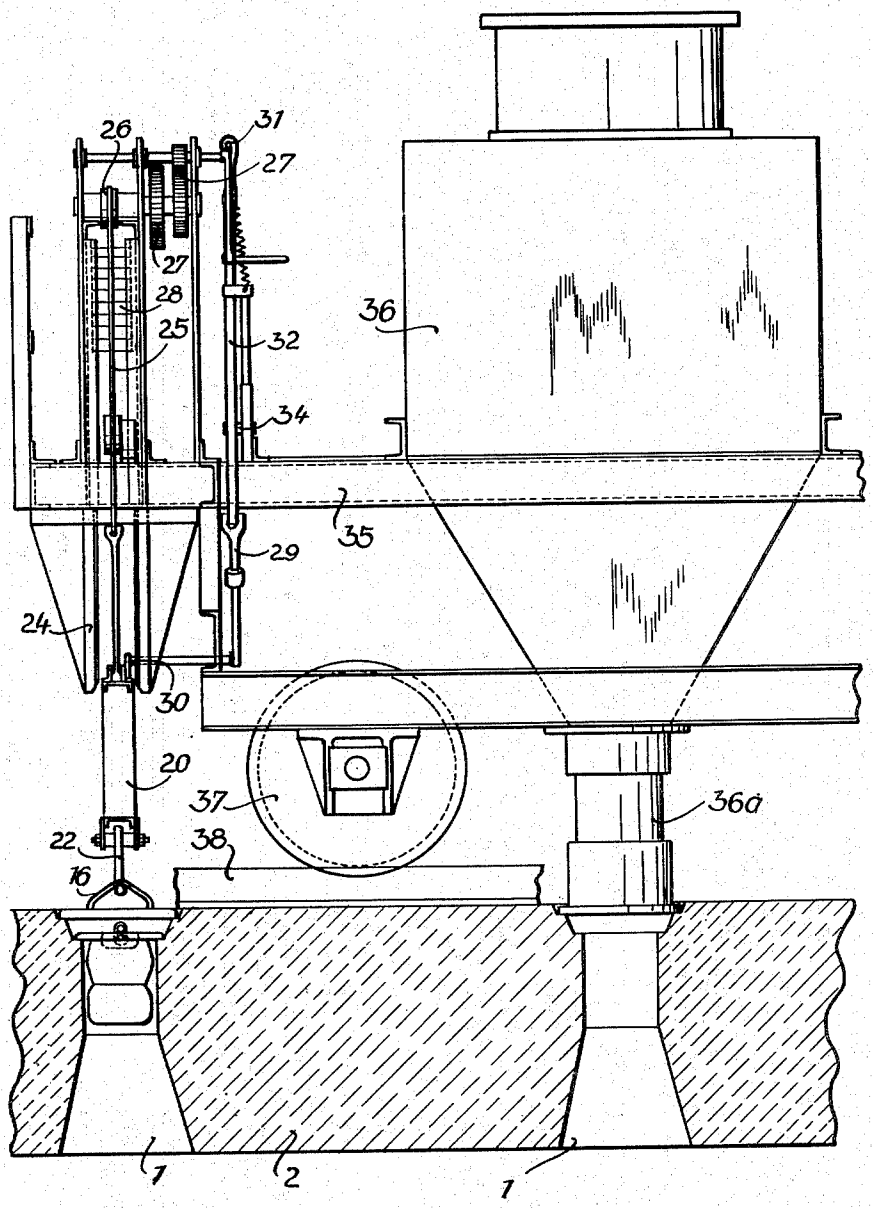
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COKE OVEN CHARGING-HOLE CLOSURE CONSTUCTION

Filed April 7, 1937 3 Sheets-Sheet 3

Fig. 4



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2,203,698

COKE OVEN CHARGING-HOLE CLOSURE CONSTRUCTION

Wilhelm Schmidt, Essen, Germany, assignor, by mesne assignments, to Koppers Company, Pittsburgh, Pa., a corporation of Delaware

Application April 7, 1937, Serial No. 135,396
In Germany April 11, 1936

5 Claims. (Cl. 202—250)

The invention relates to contrivances for closing the charging holes in the roof of coking-chamber or retort ovens, for the production of gas or coke and in particular to horizontal chamber ovens, said charging openings being used for the introduction of fuel into the ovens, are closed by removable covers, of which two or more of them are arranged above each other, in the charging opening.

The object of my invention is to improve the charging-hole frames and covers of coke ovens in such a way, that a gas-tight fit of the charging-holes is assured, thus resulting in a reduction of the heat losses through the charging-holes and finally an object is the provision of a construction which simplifies the attendance to the charging-hole closures.

An essential feature of the present invention is that each charging opening is equipped with several covers, which are connected with one another by a joint but in a non-turnable way, by means of one or several hooks or the like, acting as hinges. This peculiar connection of the charging-hole covers is of special advantage insofar as both the charging-hole covers fit exactly quite independent from one another, on their seats or on the sealing surfaces provided therefor, at the upper edge of the charging hole. On account of the unturnable connection of the covers relative to each other, it is possible also to rotate the inner cover by the turning the outer cover, by which are avoided uneven faces or deposits at the sealing faces of the charging holes.

Another characteristic feature of my invention is the provision of a plug on the inner charging-hole cover at its bottom, made of refractory material, which is held by the clamps partially surrounding the plug, so that it can be removed from the inner charging-hole cover.

Still further objects of my present invention may be taken from the following description of a preferred embodiment thereof, on the lines of the accompanying drawings, in which

Figure 1 is a vertical section through a charging-hole closure for coking chambers according to the invention and

Figure 2 is a vertical section of the same charging-hole closure taken through another line.

Figure 3 is a schematic side view of a contrivance for a horizontal chamber oven, to be used for lifting several charging-hole covers, simultaneously and

Figure 4 finally is a side elevational view partly section on an enlarged scale on lines IV—IV of Figure 3.

In the brickwork 2 of the chamber roof is situated the charging-hole 1. The upper edge of the charging-hole 1 is covered by a metallic frame 3, which protects the refractory brickwork from damages. Two ring-shaped sealing faces 4 and 5, on which rests the charging-hole covers 6 and 7, are provided on to the frame 3 at different heights.

The charging-hole covers 6 and 7 are interconnected by means of a curved flat-iron 8, having the shape of a double hook which connects a lower hinge-eye 9 of the cover and a stay 10 arranged in a recess 11 of the lower charging-hole cover 7.

This combination of the covers 6 and 7 allows that the covers 6 and 7 can be moved towards one another, to enable the covers 6 and 7 to come to a proper fit on the sealing faces 4 and 5, quite independently of the level. On the other hand, the flat-iron 8 acting as a hinge forms a non-rotary connection of the covers 7 and 6, so that on turning the upper charging-hole cover 6—for instance to press the cover 6 uniformly against its sealing face 4—the lower cover 7 is also turned, thus making a tight fit to the sealing face 5.

The lower charging-hole cover 7 is provided with a dove-tail-like extension 12, to which a plurality of hook-like clamps 13 are fastened, preferably two dish-shaped holders 13, which can be removably secured by means of screws. The clamps 13 are locked underneath the drawn-in head 14 of a refractory plug 15, which essentially fills the section of the charging-hole 1, and protects the charging-hole cover 7 against the heat from below.

Finally, a handle 16 is provided on the upper top cover 6, by means of which the cover can be removed from the charging opening.

The charging-hole covers are preferably lifted by means of a special device, carried out according to my invention, said device not only offers the special advantage that the difficult manual work is avoided when raising the charging-hole covers, but also makes it possible to arrange many charging openings in the roof of the oven, without increasing thereby the costs for attending the oven. The arrangement of a multitude of charging holes in the chamber roof is of utmost importance in connection with the carbonization, since a uniform distribution of the fuel inside the coking chamber can be effected.

An essenial peculiarity of the lifting device for the charging-hole covers as described in the present invention comprises a latticed girder 20, to the member 21 of which a series of robust hooks 22 is arranged, which are fastened adjustably in the extension holes 23 by means of screws. The latticed girder can be lifted and lowered in its guides 24. The girder is held by a Gall-chain or by another suitable pulling device 25, which runs over the driving roller 26 of a hand-drive 27, and which is equipped at its other end with a balance weight 28. By manipulating the hand crank of the driving gear the

latticed girder 20 can be lowered and lifted, as required.

A tie-rod 29, the length of which can be adjusted, further engages a link 30 of the latticed girder. This tie-rod 29 leads to a double lever 32, provided with a set handle 31. The lever is arranged upon the service platform 33 near the driving gear 27. The double lever 32 is supported rotatably at 34 in such a way, that the latticed-girder can be reciprocated in the longitudinal direction by means of the tie rod 29.

This reciprocating movement serves to bring the cover hooks 22 underneath the extracting handles 16 of the charging-hole covers, in case latter are supposed to be raised. The complete lifting device for the charging-hole covers is secured to the frame 35 of the charging lorry, comprising the ordinary coal bunkers 36. This charging lorry travels over the tracks 38 on the chamber roof by means of the wheels 37.

The manipulation of the lifting device for the charging-hole covers as illustrated on the drawings takes place as follows:

The coal charging car filled with fresh fuel first is driven to the oven to be charged in such a way, that the latticed girder 20 lies above the charging-hole covers to be lifted.

Thereupon the latticed girder 20 is lowered so far, until the hooks 22 have reached the location of the lifting handles 16 of the charging-hole covers. This position of the lifting hooks 22 is shown in dash-dotted lines at 22*a* on Figure 3 of the drawings. The hooks 22 are then brought into the lateral position, marked at 22*a*, the setting lever 32 is brought into the left end-position, due to the boshes 32*a*. As soon as the hooks 22 have reached the necessary height, so that they can be brought underneath the lifting handles 16 by the lateral movement of the latticed girder 20, the lever 32 is brought back into the operating position, as shown on the drawings. Thereby, the hooks are removed from the position indicated at 22*a* on the drawings, i. e., the hooks 22 will grip underneath the cover handles 16. Since all handles 16 of the charging-hole covers are situated in one line, and, moreover, the hooks 22 are placed in the extension holes 23 at such a spacing, which corresponds to the distance of the charging-hole covers' handle 16, all charging-hole covers of the one oven chamber will be seized by the hooks 22 of the latticed girder at the same time.

The driving gear 27 is now set into action, so that the latticed girder is lifted. Simultaneously, all the charging-hole covers will be removed from the charging holes.

After this has been done, the coal-charging car travels forward until the bunker outlets 36*a* are situated within the range of the charging openings 1, so that the coal can be charged into the chamber.

It is understood that when closing the charging holes, the above described operation will be executed in a reverse order.

Under certain conditions, it may be advisable to carry out the guides 24 of the latticed girder in such a way that they can be easily adjusted. This is of special advantage in cases where definite unequalities have to be adjusted in the arrangement of the charging holes.

I have now described my present invention on the lines of a preferred embodiment thereof, but my invention is not limited in all its aspects to the mode of carrying out as described and shown, since the invention may be variously embodied within the scope of the following claims.

I claim:

1. A contrivance for closing the charging holes in the roof of the coking chambers of coking retort ovens for the production of gas or coke, comprising several ring-shaped sealing faces, provided in the wall of the charging hole, whereby the inside diameter of the sealing faces will be less than the outer diameter, one replaceable cover of the corresponding section being provided for each sealing face, said covers being interconnected in a jointed but unturnable way, the inner cover comprising a refractory plug, and means being provided at the outer cover for manipulating the same.

2. A contrivance for closing the charging holes in the roof of the coking chambers of coking retort ovens for the production of gas or coke, comprising several ring-shaped sealing faces, provided for in the wall of the charging hole, whereby the inside diameter of the sealing faces will be less than the outer diameter, one replaceable cover of the corresponding section being provided for each sealing face, said covers being connected with one another by means of double hooks, consisting of flat-iron, suitably connecting horizontal stays in the covers, the inner cover comprising a refractory plug, and means being provided at the outer cover for manipulating the same.

3. A contrivance for closing the charging holes in the roof of the coking chambers of coking retort ovens for the production of gas or coke, comprising several ring-shaped sealing faces, provided for in the wall of the charging hole, whereby the inside diameter of the sealing faces will be less than the outer diameter, one replaceable cover of the corresponding section being provided for each sealing face, said covers being connected with one another by means of double hooks, consisting of flat-iron, suitably connecting horizontal stays in the covers, said stays having the shape of U-like projections, and a refractory plug for the inner cover.

4. A contrivance for closing the charging holes in the roof of the coking chambers of coking retort ovens for the production of gas or coke, comprising several ring-shaped sealing faces, provided for in the wall of the charging hole, whereby the inside diameter of the sealing faces will be less than the outer diameter, one replaceable cover of the corresponding section being provided for each sealing face, said covers being interconnected in a jointed but unturnable way and means provided at the outer cover for manipulating the same, the inner cover being lined on its lower side with refractory bricks, said lining being fastened by clamps provided on the cover.

5. A contrivance for closing the charging holes in the roof of the coking chambers of coking retort ovens for the production of gas or coke, comprising a ring-shaped liner consisting of a suitable metal provided for in the wall of the charging hole, and at the inner side of this lining several ring-shaped sealing faces, the inside diameter of them being less than their outer diameter, one replaceable cover of the corresponding section provided for each sealing face, said covers being interconnected in a jointed but unturnable way, a refractory plug for the inner cover, and means provided on the outer cover for manipulating same.

WILHELM SCHMIDT.