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E. SCHOEN ET AL

3,801,473

EXHAUST HOOD FOR COKE OVEN QUENCHING CAR

Filed March 9, 1971

4 Sheets-Sheet 1

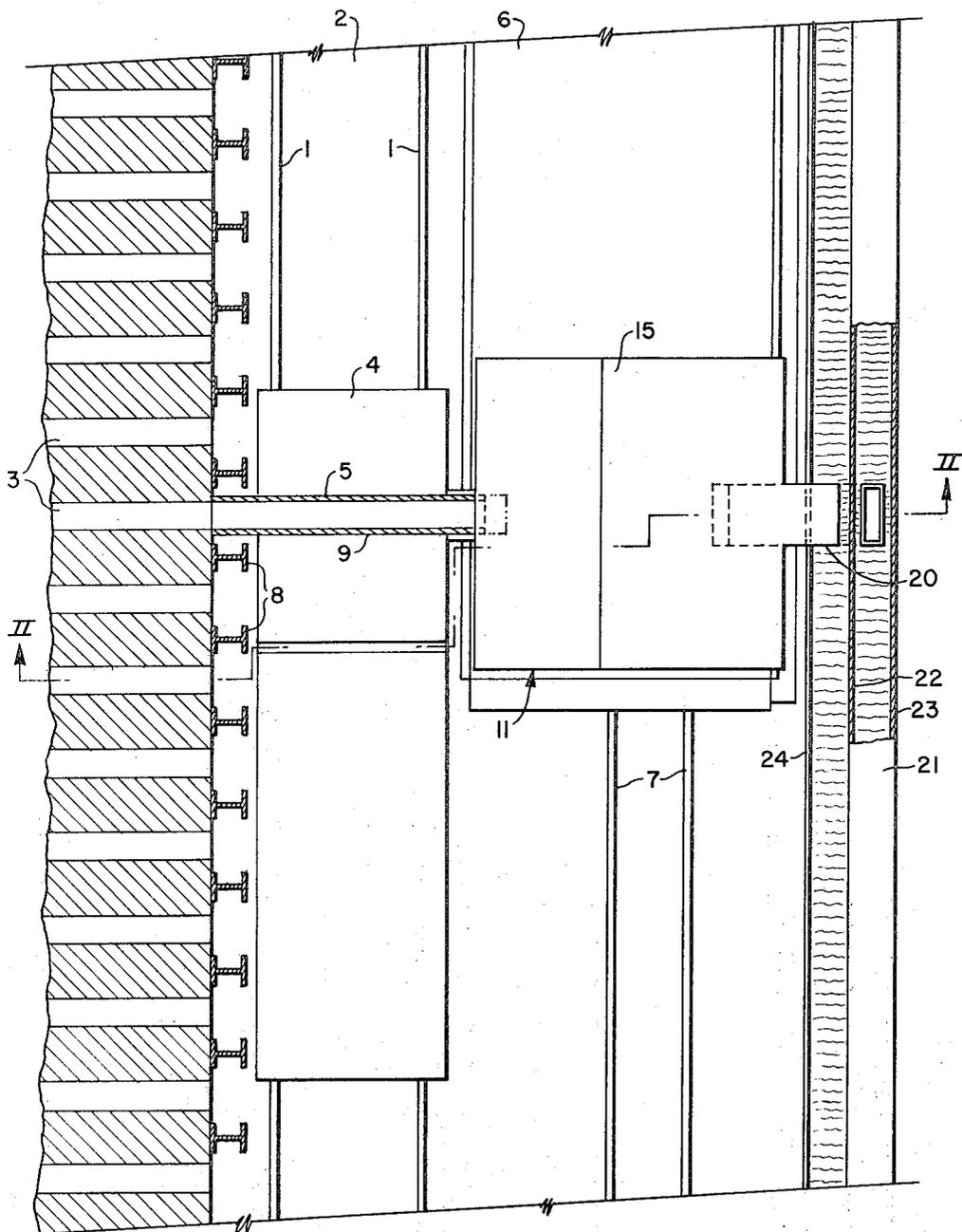


Fig. 1

INVENTORS.
ERICH SHOEN
FRIEDRICH DREBES
GUNTER BIRRESBORN
BY *Brown, Murray, Flick
and Peckham*
ATTORNEYS

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4 Sheets-Sheet 2

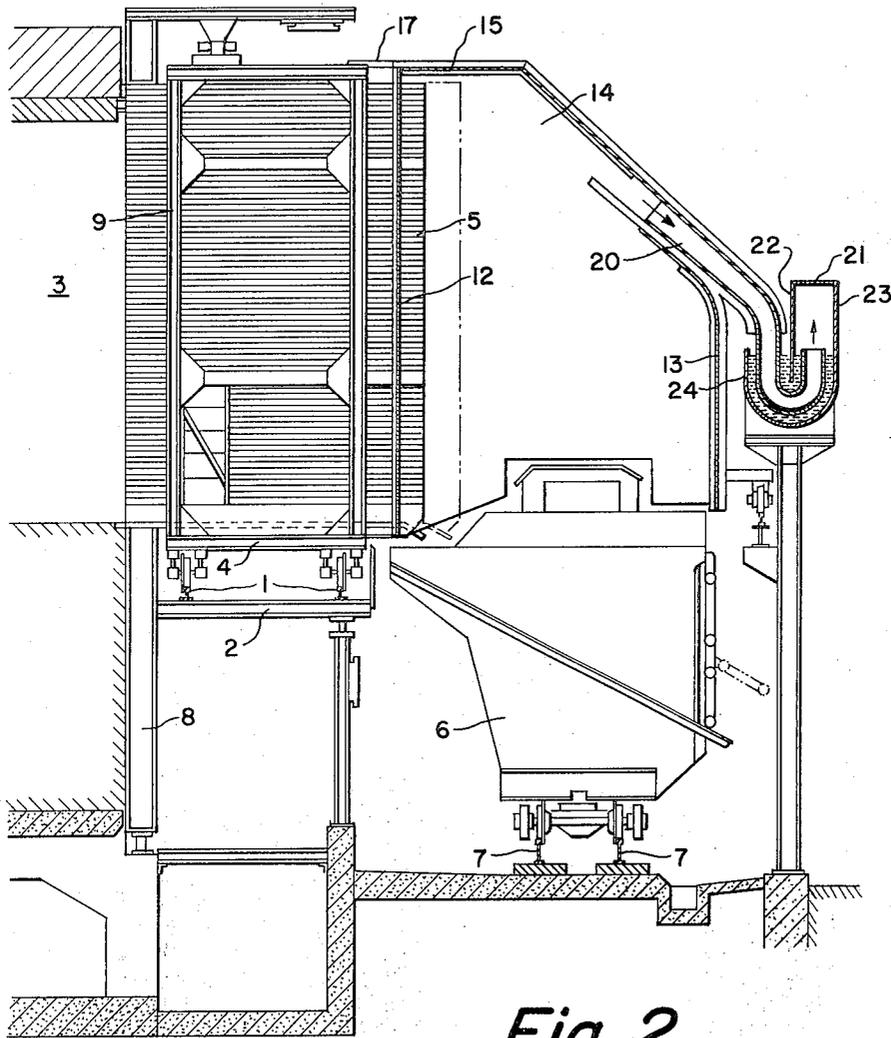


Fig. 2

INVENTORS.
ERICH SHOEN
FRIEDRICH DREBES
GUNTER BIRRESBORN
BY *Brown, Murray, Fliche*
and Peckham
ATTORNEYS

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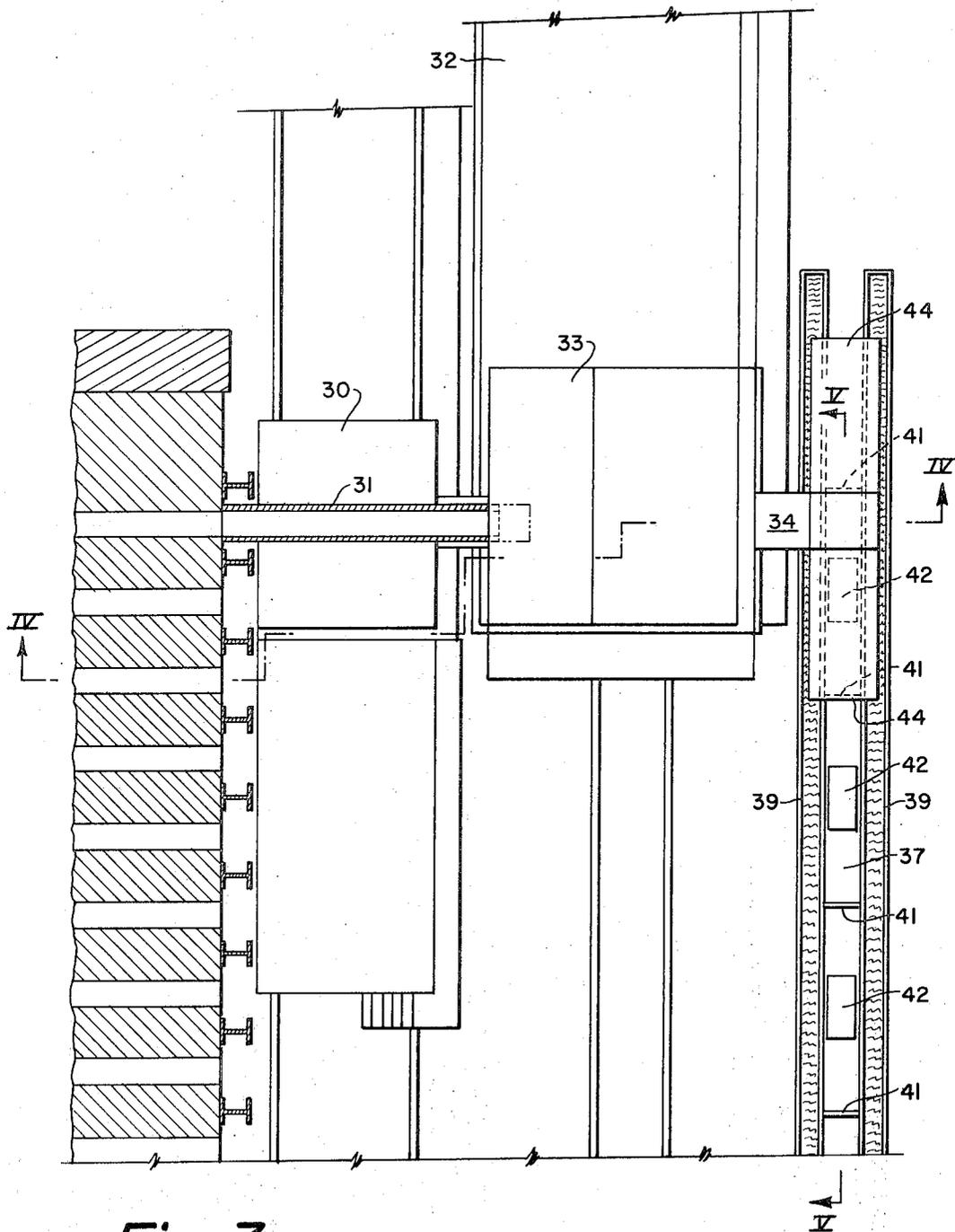


Fig. 3

INVENTORS.
ERICH SHOEN
FRIEDRICH DREBES
GUNTER BIRRESBORN
BY *Brown, Murray, Flick
and Peckham*
ATTORNEYS

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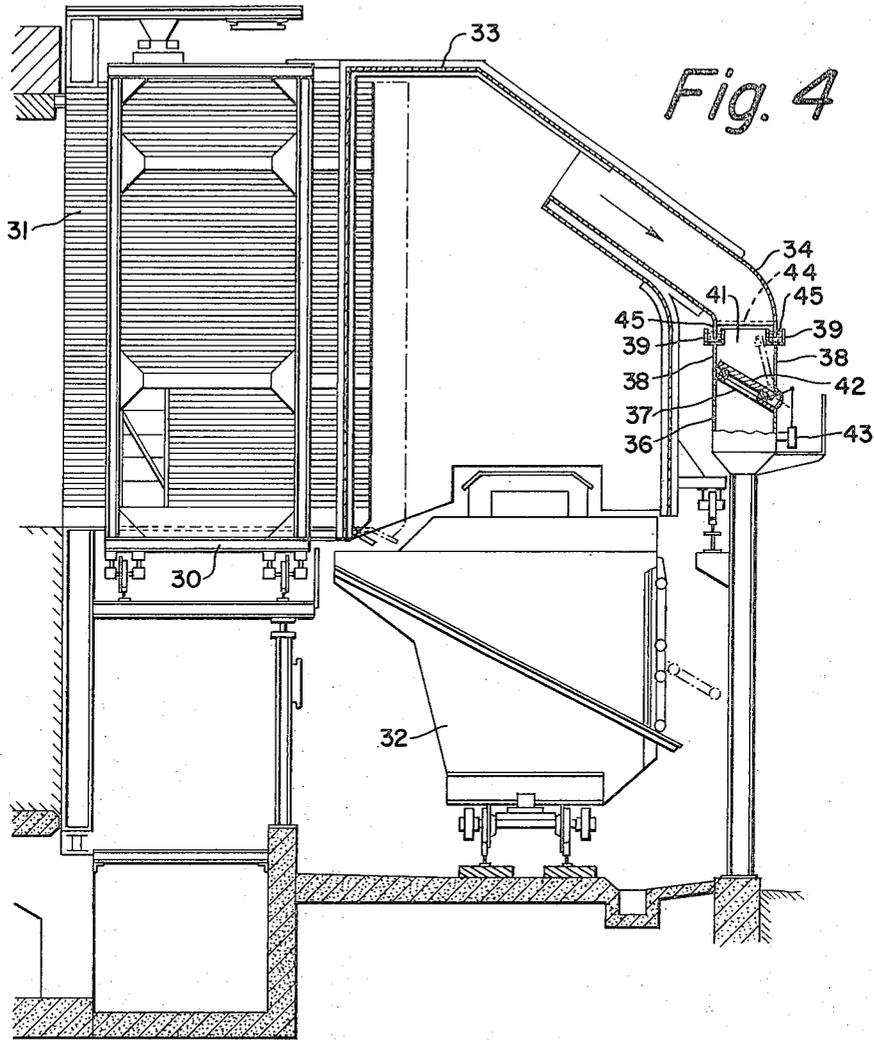


Fig. 4

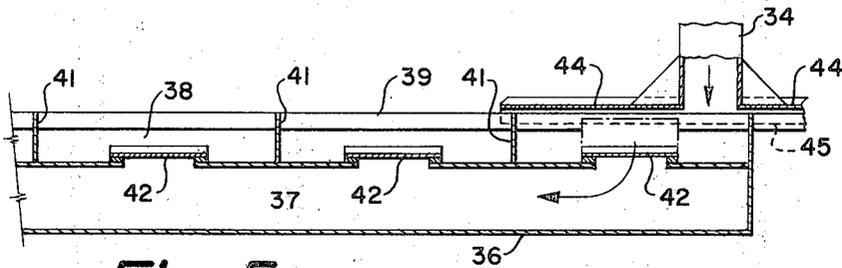


Fig. 5

INVENTORS.
ERICH SHOEN
FRIEDRICH DREBES
GUNTER BIRRESBORN
BY *Brown, Murray, Flick
and Beckham*
ATTORNEYS

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3,801,473

**EXHAUST HOOD FOR COKE OVEN
QUENCHING CAR**

Erich Schoen, Bochum-Weitmar, and Friedrich Drebes
and Gunter Birresborn, Bochum, Germany, assignors
to Dr. C. Otto & Comp. G.m.b.H., Bochum, West
Germany

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Int. Cl. C10b 33/00

U.S. Cl. 202-263

5 Claims

ABSTRACT OF THE DISCLOSURE

A quencher car runs along a track in front of a carriage that is movable along the front of a battery of coke ovens and that supports a tubular coke guide through which coke can be pushed from any oven into the quencher car. The carriage also carries a fume-collecting hood that projects laterally from it over the track to overlie the quencher car. The hood has an inner side wall provided with an opening registering with the outlet of the guide. An exhaust pipe secured to the hood has an inlet in the upper part of the hood. A suction duct extends lengthwise of the track beside the outer side wall of the hood, and the outlet of the exhaust pipe communicates with the inside of the suction duct and is movable lengthwise thereof by the carriage.

With coke oven batteries, it is customary to push the coke from the ovens through a coke guide into a car that can be moved along the battery and in which the coke can be quenched. During the passage through the guide and especially during the subsequent discharge into the car, an active burning of the hot coke takes place, due to contact with the air. Thereby waste gases and smoke are formed, which carry along large quantities of dust during a turbulent ascent. It is the goal of the present invention to suppress the emission of these waste gases, which contain a large quantity of dust, into the atmosphere.

A large number of designs for suppressing emission of the aforesaid dust-containing waste gases into the atmosphere is already known. With some designs, provision is made for the waste gases to be collected under hoods and exhausted. Thereby the fumes are made harmless.

It has already been suggested that the waste gases be directed into a waste gas suction duct which runs along the battery and to which a suction apparatus, which is connected to a waste gas purifier, is attached. With the use of such a waste gas suction duct, simple apparatus for eliminating the problems produced by the waste gases is created according to this invention.

The invention is illustrated in the accompanying drawings, in which

FIG. 1 is a plan view and horizontal section of the apparatus;

FIG. 2 is a vertical section taken on the line II—II of FIG. 1;

FIG. 3 is a view similar to FIG. 1 of a modification;

FIG. 4 is a vertical section taken on the line IV—IV of FIG. 3; and

FIG. 5 is a vertical section taken on the line V—V of FIG. 3.

Referring to FIGS. 1 and 2 of the drawings, a carriage track 1 extends along the service platform 2 in front of a row or battery of coke oven 3 a short distance below their discharge doors. Running on this track is a carriage 4 that supports a coke chute or guide 5, through which coke passes from an oven to a coke quencher car 6 mounted on a track 7 in front of, but below, track 1. To

prevent smoke and gases rising into the atmosphere between the ovens and the quencher car, the coke guide is tubular. That is, it has a top wall as well as bottom and side walls. The guide is rectangular in cross section and has an inlet large enough to fit around the discharge opening of the coke oven after the door has been removed. To enable the coke guide to be moved laterally from oven to oven, it is movable away from the ovens far enough to pass the structural columns 8 that engage the ovens between their doors. The coke guide is mounted within a framework 9 on the carriage.

When coke is pushed from an oven through the guide into the quencher car 6 below the outer end of the guide, smoke and dust and noxious gases are formed and rise into the atmosphere. If the quencher car is out in the open, the atmosphere is polluted by objectionable clouds of smoke and dust. It is a feature of this invention that such pollution is prevented by mounting an exhaust hood 11 on the carriage in such a manner that it will overlie the quencher car. This hood has inner and outer side walls 12 and 13 connected by end walls 14 and a top wall 15. The bottom is open. The hood is wider than the coke guide 5 but not so wide as to extend the full length of the quencher car. Midway between its ends the inner side wall 12 of the hood is provided with a rectangular opening that fits around the outer end of the guide. The hood is rigidly supported on the carriage by means of a suitable framework 17. The coke guide can be moved into the hood, as indicated in dotted lines in FIG. 2, far enough to clear columns 8. The inner side wall of the hood is above the inner edge of the quencher car, and the outer side wall of the hood is above the outer edge. Consequently, smoke and dust rising from coke falling from the outlet of the guide into the car will rise into the hood.

To dispose of this rising smoke and dust without allowing it to pollute the atmosphere, the hood is provided with an exhaust pipe 20 that extends downwardly along the lower surface of the sloping top of the hood from an inlet in the upper part of the hood to an outlet outside of the hood. The outlet of the exhaust pipe opens into a suction duct that is connected to an exhauster (not shown) by which the smoke and dust is conducted to a location where it can be processed and disposed of safely. The suction duct has an upper wall 21 and two downwardly extending side walls 22 and 23. The outer side wall 23 forms a continuation of the outer side wall of a trough 24 that is closed at its opposite ends. The inner side wall 22 of the duct extends down into the central portion of the trough but is spaced from its bottom. The outer end of the exhaust pipe extends down into the trough between its inner side wall and the inner wall of the suction duct. The pipe then curves outwardly under the inner wall of the duct and extends up into the duct. The trough is filled with water to a level above the lower edge of the inner wall of the suction duct but below the outlet of the exhaust pipe. The water therefore forms the bottom of the suction duct. The exhaust hood can be moved by the carriage along the duct and trough and the exhaust pipe will always exhaust up into the duct.

In operation, after the door has been removed from a coke oven the carriage 4 is moved in front of it and the tubular guide 5 is moved inwardly to surround the door opening. The coke in the oven is then pushed out through the guide and exhaust hood 11 and into the underlying front end of the quencher car. As the car is filled it is moved slowly forward beneath the hood so that the coke will be distributed as uniformly as possible over the entire length of the car. During this loading operation the smoke and dust rising from the coke falling into the car leave the exhaust hood through its exhaust pipe 20 and

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enter the suction duct, through which they are carried away.

In the modification shown in FIGS. 3 to 5, the carriage 30, coke guide 31 and quencher car 32 are the same as described before. The exhaust hood 33 likewise is essentially the same as the first one, but the suction duct arrangement is different and the outer end of the exhaust pipe 34 projecting from the hood faces downwardly. The suction duct 36 itself is spaced below the exhaust pipe and has an upper wall 37. Extending upwardly from opposite sides of the duct are vertical side walls 38, along the upper edges of which extend channels or troughs 39 filled with water. At longitudinally spaced intervals along the top of the duct there are vertical partition walls 41 between the upwardly extending side walls 38. Between each pair of these partitions the upper wall of the underlying duct is provided with an outlet opening normally closed by a hinged valve 42 that can be opened by a fluid pressure cylinder 43 beside the duct.

While the outlet of exhaust pipe 34 is above the area between any given pair of partitions 41, the top of that area is closed by at least one of the two horizontal cover plates 44 that extend lengthwise in opposite directions along the duct from the pipe. It is only in the covered area that a valve 42 is open so that the exhaust pipe will be put in communication with the suction duct. To further seal this covered area, the edges of the cover plates and the inner and outer sides of the exhaust pipe outlet are provided with vertical baffle flanges 45 that extend down into the water in the two troughs 39. As the exhaust hood is moved along the battery of ovens, the exhaust pipe will move from one valve location to the next, whereupon the first valve will be closed and the second one will be opened. Consequently, the smoke and dust rising into the exhaust hood is drawn down through the open valve into the suction duct and carried away.

According to the provisions of the patent statutes, we have explained the principle of our invention and have illustrated and described what we now consider to represent its best embodiment. However, we desire to have it understood that, within the scope of the appended claims, the invention may be practiced otherwise than as specifically illustrated and described.

We claim:

1. The combination with a carriage movable along the front of a battery of coke ovens disposed side by side in a row with doors in their front ends, a tubular coke guide supported on the carriage and having an inlet for selective positioning by the carriage in front of the different ovens to receive coke therefrom, a track in front of the carriage parallel to the row of ovens, and a quencher car on the track for receiving coke discharged from said guide; of apparatus for preventing air pollution during discharge

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of coke from said guide into said car, comprising a fume-collecting hood carried by said carriage and projecting laterally therefrom over said track to overlie said car, said hood having an inner side wall provided with an opening registering with the outlet of said guide, an exhaust pipe secured to the hood and having an inlet in the upper part of the hood, a suction duct including inner and outer side walls extending upwardly and lengthwise of said track with the inner side wall disposed beside the outer side wall of the hood, the outlet of the exhaust pipe communicating with the inside of said suction duct and being movable lengthwise of the duct by the carriage, horizontal water trough means forming part of said suction duct for sealing the outer end of said exhaust pipe between the outer and inner side walls of the duct, longitudinally spaced vertical partition walls between said side walls, a normally closed valve in the top of the duct between each pair of partitions, cover plates carried by the outer end of said exhaust pipe and extending in opposite directions therefrom along said side walls for covering the space between a pair of said partition walls, and means for opening the valve in the space beneath the outer end of the exhaust pipe.

2. Apparatus according to claim 1, in which said hood extends lengthwise of the carriage in opposite directions from said coke guide.

3. Apparatus according to claim 1, including means supporting the hood on said carriage independently of said coke guide, said guide being movable lengthwise into the hood a predetermined distance.

4. Apparatus according to claim 1, including an elevated rail extending lengthwise of said track adjacent the outer side wall of the hood, and means secured to the hood and running on said rail to help support the hood.

5. Apparatus according to claim 1 wherein said water trough means extend along the upper edge of each of said side walls, said apparatus further comprising baffle flanges extending down into said troughs from said cover plates and outer end of the exhaust pipe.

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NORMAN YUDKOFF, Primary Examiner

D. EDWARDS, Assistant Examiner

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