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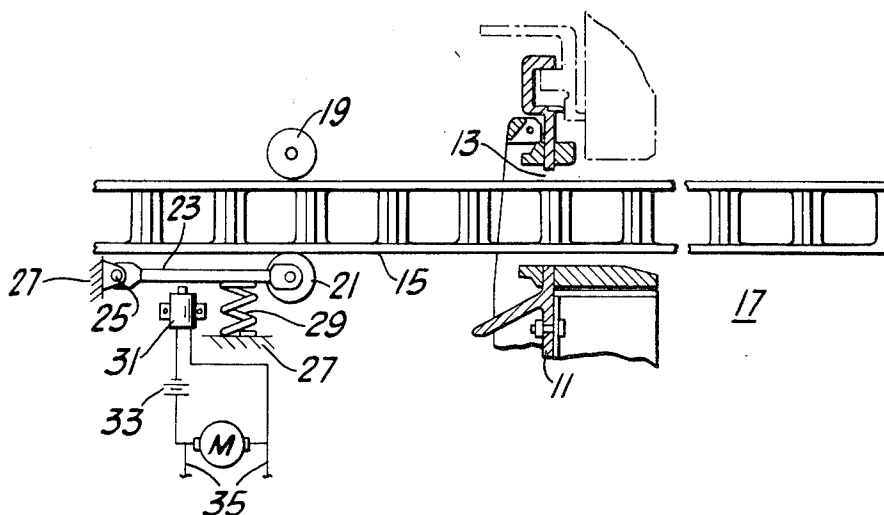
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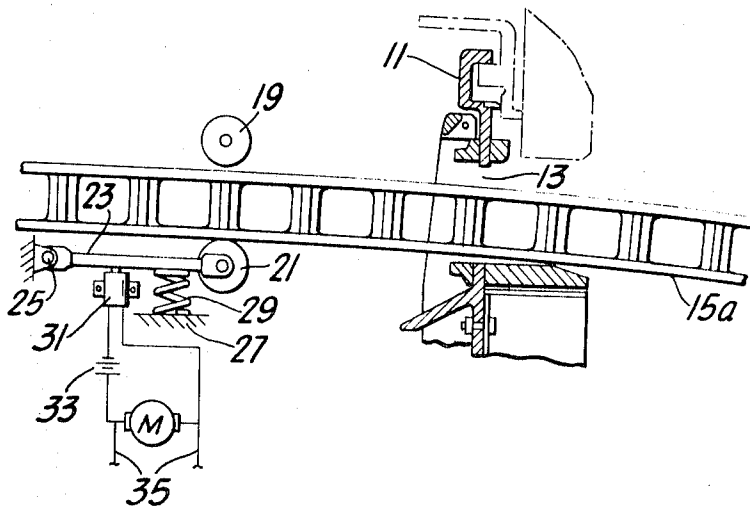
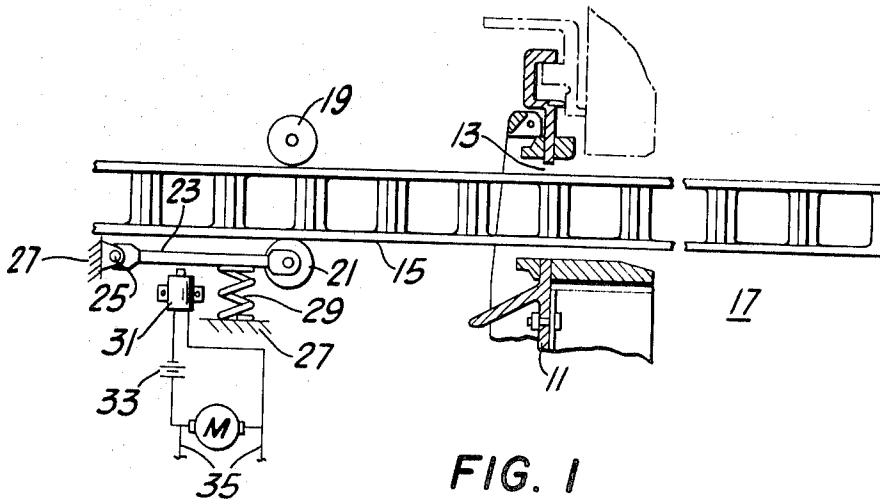
[54] **LOAD-SENSING DEVICE FOR A COKE OVEN LEVELING BAR**
4 Claims, 2 Drawing Figs.

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[50] Field of Search **202/262, 265, 270, 251; 318/286; 214/23; 201/39**

ABSTRACT: A leveling bar for a coke oven battery that deflects more than a preselected amount because of a deficiency of coal in a coking chamber, actuates a limit switch and the leveling bar retracts from the oven.





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LOAD-SENSING DEVICE FOR A COKE OVEN LEVELING BAR

BACKGROUND OF THE INVENTION

In an effort to obtain smokeless charging of coke oven chambers in batteries having single gas-collecting mains, in particular, it has been proposed that, after each oven has been charged with coal to about 75 percent of its capacity, the feed gates on the larry car close and that the larry car operator then signal the pusher machine operator to commence leveling the coal in the coke oven chamber. As soon as leveling commences, the larry car operator resumes charging coal into the particular chamber, and both operations are carried out simultaneously. Leveling continues until all of the coal has been charged, and the leveling bar has been withdrawn after the charge has been leveled.

In single gas-collecting main batteries, it is important to level the coal as the last one-quarter portion is being charged to prevent an excessive buildup of generated gases on the far side (coke side) of the chamber. Such a buildup of gases would necessitate venting such gases to the atmosphere. Hence, leveling while charging is being completed is a necessity in single gas-collecting main batteries.

However, coke oven chambers in ovens built at the present time are much longer than those constructed formerly, and if the leveling bar is allowed to enter the oven without there being enough coal therein to support the leading end portion of the bar, the cantilever leveling bar may be subjected to excessive flexural stresses and deflection and the bar may become jammed in the leveling bar door opening and cannot be withdrawn.

How the present invention overcomes the problem described herein in an efficient and simple manner is disclosed in the following description of a preferred embodiment of the invention.

SUMMARY OF THE INVENTION

A limit switch is positioned on the pusher machine adjacent a leveling bar. When the leveling bar is extended into a coke oven chamber having insufficient coal therein and deflects excessively, the leveling bar contacts the limit switch, and the driving motor that advances and retracts the leveling bar is actuated to withdraw the leveling bar from the coke oven chamber.

BRIEF DESCRIPTION OF THE DRAWING

One embodiment of the invention illustrated in the drawing wherein:

FIG. 1 is a schematic elevational view partly in section showing one embodiment of the invention in one operative position; and

FIG. 2 is a view similar to that of FIG. 1 showing the embodiment of the invention in another operative position.

DETAILED DESCRIPTION

Referring to FIG. 1, the upper portion of a conventional coke oven door 11 is provided with an opening 13 that is closeable in a normal manner by a leveling bar door (not shown), that is hinged to the coke oven door 11. Through this opening 13, a conventional leveling bar is inserted into a coke oven chamber 17 to level the coal piles in a coking chamber 17.

The leveling bar 15 is conventional and may be similar to the leveling bar described in U.S. Pat. No. 3,207,334. It is carried by a pusher machine 27 and is adapted to be reciprocated when extended fully across the coke oven battery. Ordinarily,

the leveling bar 15 is reasonably supported by coal in the coke oven chamber 17 so that it does not deflect as a cantilever beam beyond reasonable limits.

However, when the coke oven chamber 17 is only partially filled with coal, to 75 percent of capacity for example, the cantilever-type leveling bar 15 may deflect beyond a reasonable limit and to such an extent that it may become jammed in the leveling bar door opening 13.

The pusher machine 27 is provided also with a pair of rollers 19, 21 that coact with the leveling bar 15, as shown in FIG. 1. The roller 19 is fixed, but the roller 21 is journaled to one end of an arm 23 that is pivotally mounted, as at 25, to the pusher machine 27.

The arm 23 coacts with a spring 29 that also coacts with the pusher machine 27. Adjacent to the spring 29, there is a limit switch 31 that is positioned so as to coact with the leveling bar 15 whenever it deflects beyond a preselected reasonable limit. The limit switch 31 is connected electrically in circuit to a power source 33 and a motor, M, that advances and retracts the leveling bar into and out of the coke oven chamber 17.

The motor, M, is also connected by means of wires 35 with a reversing circuit (not shown) so that, when the leveling bar 15a of FIG. 2 deflects to within close proximity of the limit of deflection and actuates the limit switch 31, the motor, M, reverses and retracts the leveling bar 15a from the coke oven chamber 17. The spring 29 provides resilient bias so that reasonable deflection of the leveling bar 15 is possible without engaging the limit switch 31.

Those skilled in the art will recognize in the above-described invention several significant features and advantages among which are:

That the apparatus of the invention is simple and is effective to prevent jamming of the leveling bar in the leveling bar opening of the coke oven door; and

that in long coke oven chamber, the apparatus of the invention signals the driving motor of the leveling bar to retract the bar when it deflects to such an extent that the bar may not be retractable.

What is claimed is:

1. In a coke oven battery having a coke oven chamber with a door in which there is an opening through which a coal-leveling bar reciprocates to level coal in said chamber, the improvement comprising:

- a. first means coactive with said leveling bar when said bar is extended into said chamber and deflects beyond a preselected limit; and
- b. second means responsive to the first means for retracting said leveling bar.

2. The invention of claim 1 wherein:

- a. said first means is a limit switch; and
- b. said second means is a reversible motor.

3. The invention of claim 2 including:

- a. means resiliently biased with said leveling bar for partially supporting said leveling bar.

4. In a coke oven battery having a coke oven chamber with a door in which there is an opening through which a coal-leveling bar reciprocates to level coal in said chamber, the improvement comprising:

- a. a limit switch mounted adjacent said bar;
- b. an arm pivotally mounted adjacent to said leveling bar and carrying a roller that coacts with said bar;
- c. a spring coacting with said arm to maintain said roller in contact with said leveling bar as said bar reciprocates; and
- d. means acting responsively to a signal from said switch when said leveling bar deflects and actuates said switch, for retracting said leveling bar from said coking chamber.