May 15, 1945. G. ORPHAN 2,376,079

STOKER SIGNAL

Filed Aug. 17, 1942 2 Sheets-Sheet 1

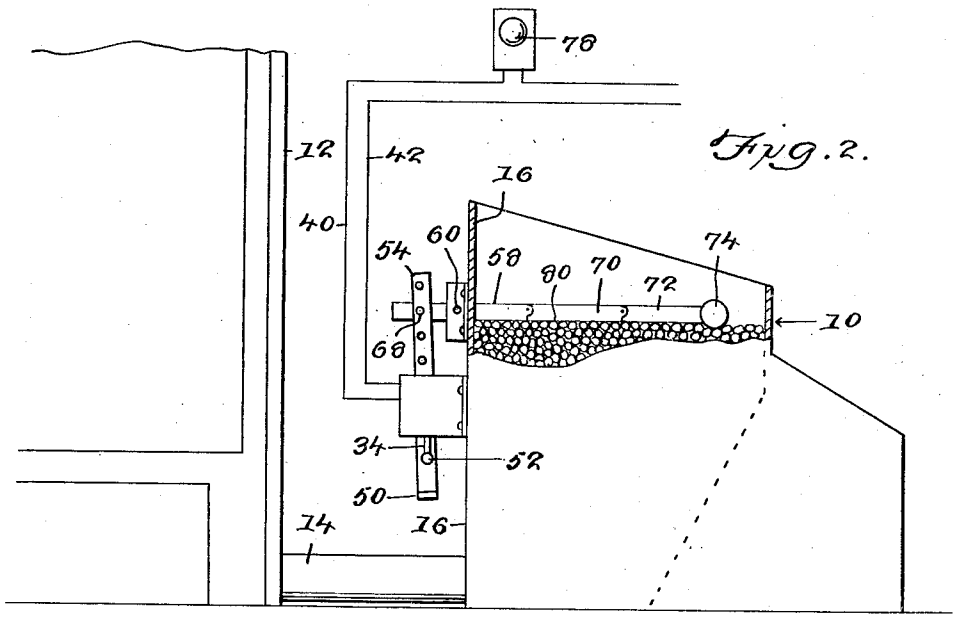


Fig. 2.

Fig. 1.

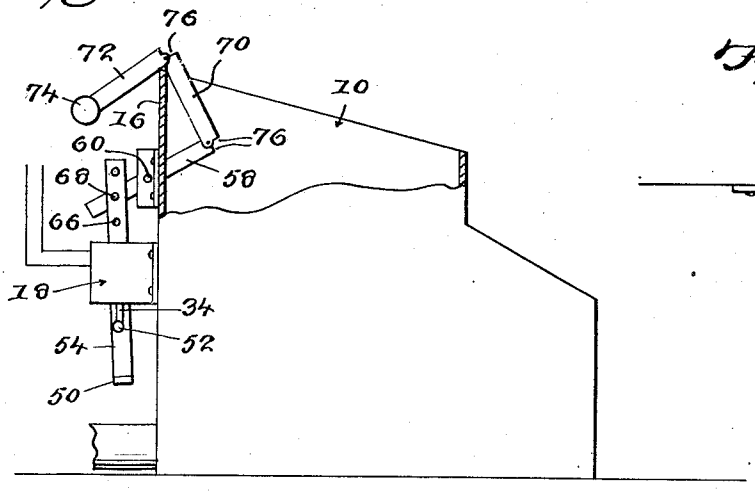
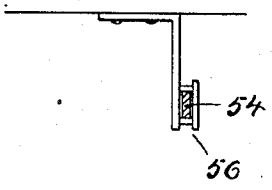


Fig. 6.



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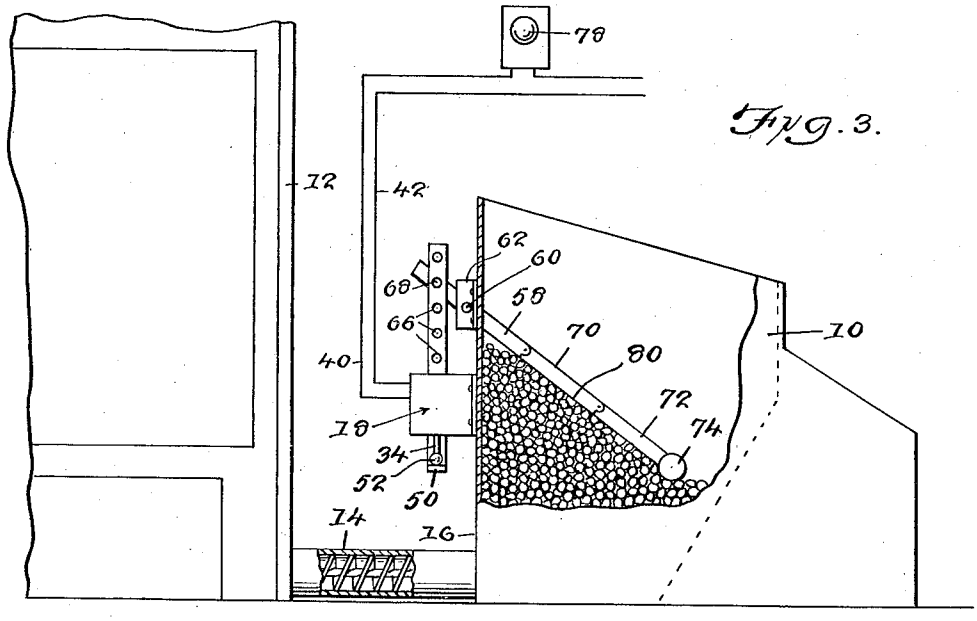


Fig. 3.

Fig. 4.

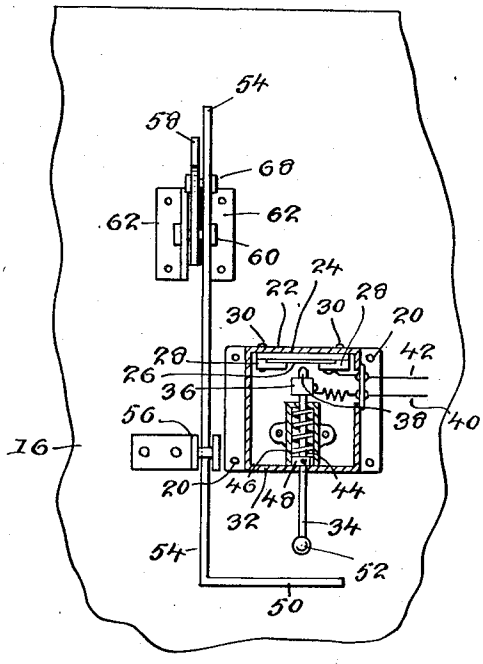
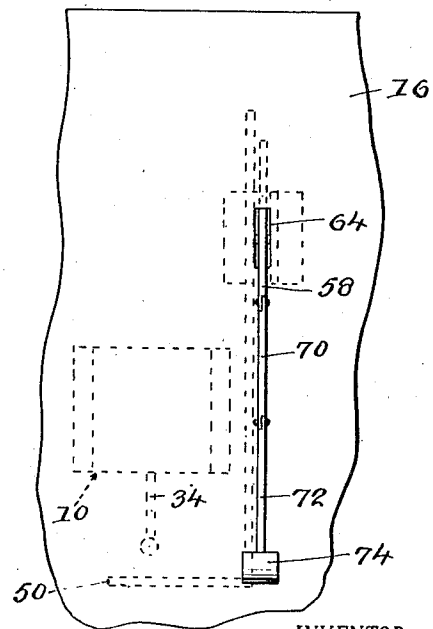


Fig. 5.



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UNITED STATES PATENT OFFICE

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STOKER SIGNAL

George Orphan, Ottawa, Ill.

Application August 17, 1942, Serial No. 455,124

2 Claims. (Cl. 200—52)

My invention relates to automatic machinery, particularly stokers for domestic furnaces and the like, and has among its objects and advantages the provision of an improved warning signal which is brought into action when the coal supply is reaching an objectionably low point.

In the accompanying drawings:

Figure 1 is a side view of a stoker hopper with a portion broken away to illustrate the position of the signal actuating means when the hopper is being filled;

Figure 2 is a similar view illustrating the hopper filled;

Figure 3 is a view illustrating the system set in operation through reduction of the coal supply in the hopper;

Figure 4 is a sectional detail view of a warning switch;

Figure 5 is a view illustrating a switch actuating arm; and

Figure 6 is a view of a guide for one of the switch actuating parts.

In the embodiment selected for illustration, the hopper 10 and the furnace 12 are conventional, with a duct 14 placing the hopper in communication with the furnace. To the wall 16 of the hopper 10 is mounted a switch housing 18, as through the medium of bolts 20. To the wall 22 of the housing 18 is secured insulation 24 against which is positioned a contact plate 26 held in position by clamps 28. The clamps 28 and the insulation 24 are secured to the wall 22 by bolts 30.

Extending through an opening in the wall 32 of the housing 18 is a switch rod 34 provided with an insulative body 36 carrying a contact 38 electrically connected with a line wire 40. The contact 26 is connected with a second line wire 42.

The rod 34 is slidably guided in a tube 44 secured to the housing 18 and containing a compression spring 46 engaging one end of the tube and a flange 48 attached to the rod 34 for normally holding the rod in the position of Figure 4, with the contact 38 spaced from the contact 26. The contact 38 may be moved into engagement with the contact 26 by means of an arm 50 engageable with a head 52 on the rod 34. This arm is fixedly connected with the lower end of a bar 54 slidably guided in a bracket 56 attached to the hopper wall 16.

A lever 58 is pivotally connected intermediate its ends at 60 with angles 62 secured to the wall 16. This lever extends through a slot 64 in the wall 16. A plurality of openings 66 is provided in the bar 54 for selective reception of a bolt 68 passing through an opening in the lever 58 for pivotally connecting the lever with the bar outside the hopper. To the inner end of the lever 58 is pivotally connected one end of a bar 70, the other end of this bar being pivotally connected with one end of a second bar 72 having a weight 74 at its free end.

Coacting shoulders 76 are formed on the lever 58 and the bars 70 and 72 so that the parts may be pivoted to the positions of Figure 1 to facilitate loading of the hopper 10. However, the shoulders engage when the lever and the bars are brought into end to end alignment to restrain further relative pivotal movement between the parts, as in Figures 2 and 3.

An electrically energized signal lamp 78 is interposed in the line wire 40. This lamp may be mounted on a wall inside a first floor room.

In operation, the hopper 10 is loaded with coal 80 to the level indicated in Figure 2, at which time the lever 58 and the bars 70 and 72 lie horizontally at rest on the coal. As the coal diminishes in the hopper, the downward pivotal movement of the lever 58 and the bars 70 and 72 imparts a lifting motion to the bar 54 to bring the arm 50 into lifting engagement with the rod 34 to close the circuit through the lamp. This takes place before all the coal has been removed from the hopper so that some time is allowed for hopper filling purposes. In fact, the lamp 78 may burn for some time before all the coal is burned to eliminate the necessity of immediate attention, particularly in the event that the attendant is absent at the moment that the circuit is closed through the lamp.

Without further elaboration, the foregoing will so fully illustrate my invention, that others may, by applying current knowledge, readily adapt the same for use under various conditions of service.

I claim:

1. A switch-operating device for use with a coal stoker having a hopper from which the coal is fed, a lever pivotally attached to the hopper near the top thereof at the outside and extending through an opening in the wall of the hopper to engage the coal and move downwardly as the level of the coal falls with use, a pair of relatively pivoted bars one of which is pivotally attached to the lever, said bars also engaging the surface of the coal pile and folding up when coal is to be placed in the hopper, a weight attached to the free end of the outermost bar, a vertically movable switch actuating bar connected with the free end of the lever to be moved by the lever as the level of the coal is raised or lowered and designed to contact a

switch operating arm when the level of the coal in the hopper is low.

2. A switch-operating device for use with a coal stoker having a hopper from which the coal is fed, a lever pivotally mounted at a point off-center between its ends to a support outside the hopper near the top thereof and the long end extending through an opening in the wall of the hopper to engage the coal and move downwardly as the level of the coal falls with use, a pair of bars pivoted to each other to fold in one direction and one of said bars pivotally attached to the long end of the lever to fold in one direction, a shoulder formed on each bar and the lever to limit pivoting movement, a weight at the free end of the outermost bar, a vertically movable switch actuating bar carried in supports at the outside of the hopper below the lever and pivotally connected to the short end of the lever and a right angularly extending arm on the lower end of the switch actuating bar to contact a switch actuating arm when the level of the coal in the hopper is low.

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