Oct. 31, 1961 O. A. JOHNSON 3,007,147

ALARM FOR DRUM-TYPE FEEDER

Filed Aug. 23, 1957

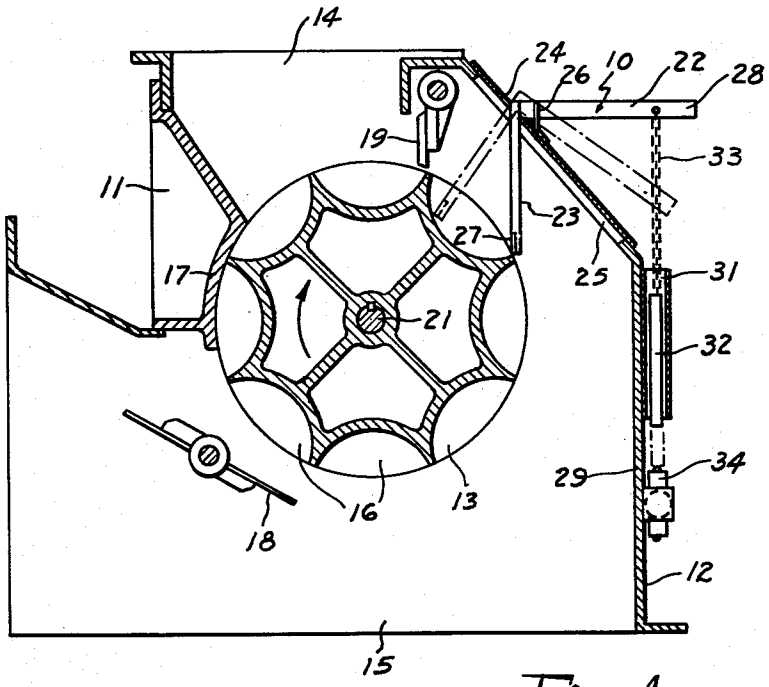


Fig. 1

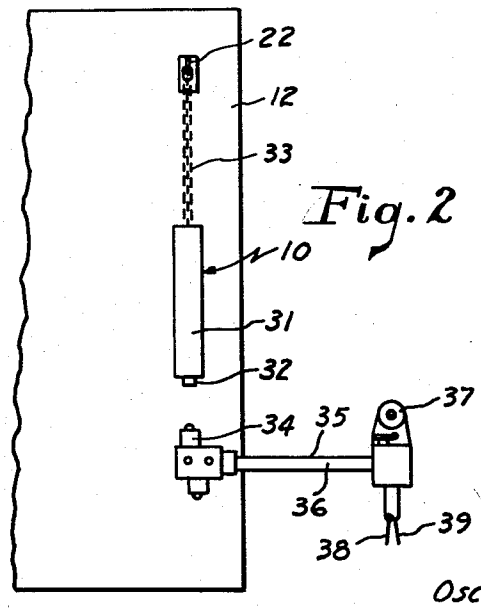


Fig. 2

INVENTOR.
OSCAR A. JOHNSON

BY
Norman S. Blodgett

United States Patent Office 3,007,147 Patented Oct. 31, 1961

3,007,147

ALARM FOR DRUM-TYPE FEEDER

Oscar A. Johnson, Worcester, Mass., assignor to Riley Stoker Corporation, Worcester, Mass., a corporation of Massachusetts

Filed Aug. 23, 1957, Ser. No. 679,865
2 Claims. (Cl. 340—236)

This invention relates to an alarm for a drum-type feeder, and more particularly to apparatus used to indicate a failure of flow of fuel or similar material through a feeding mechanism.

In the handling of comminuted material, particularly powdered fuel for a furnace, one of the difficulties often experienced is that the fuel becomes jammed in the conduit and the flow of fuel to the furnace is stopped. When this happens, the fire in the furnace may go out and, not only is the load on the furnace not taken care of, but the difficulties of re-igniting the fire are presented. When the furnace is being used with a steam generating unit, a failure of the fire for this reason may result in the shutdown of an entire factory. These and other difficulties experienced with prior art devices have been obviated by the present invention in a novel manner.

It is, therefore, an outstanding object of this invention to provide apparatus for use with a drum-type feeder which will indicate the failure of fuel flow through the feeder.

It is another object of the present invention to provide an alarm apparatus for indicating a failure of material flow.

It is still further an object of the instant invention to provide a means for indicating a material flow failure, which apparatus is rugged and dependable, and which is relatively easy and inexpensive to manufacture.

To the accomplishment of the foregoing and related ends, the invention, then, comprises the features hereinafter fully described and particularly pointed out in the claims. The following description and the annexed drawings setting forth in detail certain illustrative embodiments of the invention, these being indicative, however, of but a few of the various ways in which the principle of the invention may be employed.

In said annexed drawings:

FIG. 1 is a vertical, sectional view of apparatus embodying the principles of the present invention, and

FIG. 2 is a side view of the external aspects of the apparatus shown in FIG. 1.

Referring to the drawings, it can be seen that the apparatus of the invention, indicated generally by the reference numeral 10, is shown in use in conjunction with a drum-type feeder 11. The apparatus 10 is mounted on a housing 12 of the feeder and this same housing contains a drum 13. The housing 12 is provided with an entrance passage 14 which is adapted to be connected by means of a conduit, not shown, to a fuel bunker, not shown. Housing 12 is also provided with an outlet 15 which is normally connected to a furnace stoker or the like, not shown. The drum 13 is of generally cylindrical conformation, and is formed with a number of semi-cylindrical pockets 16. A scraper 17 rests against the circumference of the drum and a pivoted clean-out panel 18 underlies the drum and serves to assure that fuel is cleaned from each of the pockets. A pivoted leveling device 19 is located adjacent the inlet 14 and has a blade which rests against the surface of the drum to level the fuel in the pockets. The drum is mounted and keyed to a shaft 21 which is supported in the usual way in bearings, forming part of the housing 12, and is driven by a motor, not shown.

A bell crank 22 is pivotally supported at its junction portion with the housing 12 and positioned so that a finger

23 extends through a slot 24 in the housing 12. Preferably, the slot 24 and the bell crank 22 are located on a sloping portion of the drum 13. The pivotal movement between the bell crank 22 and the housing 12 is supplied by means of a metal strip which is capable of swinging into each of the pockets 16 when the pocket is located so that its center of curvature is on a line joining the pivot point of the bell crank 22 with the center of the shaft 21. The end of the finger is provided with a tungsten carbide insert 27. The other arm 28 of the bell crank 22 extends horizontally well beyond the junction of the sloping portion 25 of the housing 12 and the vertical wall 29 thereof. Mounted on the wall 29 is a guide tube 31 adapted to hold and guide a weight 32 of an elongated, cylindrical form. A chain 33 joins the weight 32 with the lever arm 28 of the bell crank 22. Mounted on the wall 29 directly below the guide 31 and the weight 32 is a switch 34. The switch 34 is connected by suitable electrical lines 35 and 36 to a bell 37, or similar alarm. Electrical lines 38 and 39 connect the apparatus with a source of power, not shown. The electrical circuit involves an arrangement in which the closure of the switch 34 causes current to pass through the bell 37 to actuate it.

The sizes of the elements and their location are selected in such a manner that when the finger 23 lies outside of the pocket 16, that is, adjacent the periphery of the drum 13, the weight 32 is held well above the switch 34 and lies almost completely within the tube 31. When the finger 23 lies within a pocket 16, however, the weight is lowered and contacts the switch 34 to energize the bell 37.

The operation of the apparatus will now be clearly understood in view of the above description. Fuel arrives at the feeder 11 from a bunker to the inlet 14. The fuel pours downwardly onto the drum 13 and fills the pockets 16. As the drum revolves, each pocket 16 successively comes adjacent the leveling device 19. Any amounts of coal in excess of the contents of the pockets 16 are scraped away by the leveling device 19. If, however, a large piece of fuel comes around in the drum, the device 19 is capable of swinging out of the way to prevent damage to itself and the feeder. The drum continues to rotate and eventually each pocket reaches the point where the coal falls out of it and leaves the feeder through the outlet 15 on its way to the furnace. The cleaning device 18 assures that all of the coal is removed from each pocket by swinging into the pockets and cleaning them out. When each pocket whose contents have been leveled out by the device 19 reaches the area adjacent to finger 23, the finger rides over the surface of the coal in the pockets and is maintained in its position adjacent the periphery of the drum. If, however, the pocket does not contain fuel, the finger 23 is capable of swinging into the pocket, as shown in the dotted-line position in the drawings. As the finger swings inwardly, the weight 32 is lowered and, eventually, if the finger swings far enough inward, the weight will strike the switch 34 and cause the bell 37 to ring. The operator will know that an empty pocket exists in the drum and will investigate to see whether there is a failure of fuel flow from the bunker to the feeder. In this way he can take care of the situation immediately and make certain that fuel failure is remedied so that the furnace continues to operate in the usual manner.

Other modes of applying the principle of the invention may be employed, change being made as regards the details described, provided the features stated in the following claims, or the equivalent of such, be employed.

The invention having been thus described what is claimed as new and desired to secure by Letters Patent is:

1. A feeder for particulate material, comprising a rotatable drum formed with a series of arcuate pockets, a housing, a finger pivotly mounted on the housing and

extending therein to swing from a first position which is located externally of one of the said pockets to a second position which is located within the pocket when the pocket is in an upwardly-facing condition and would normally be filled with the said material, the outer end of the finger moving through an arc that approximates the shape of the individual pockets, a lever arm connected to the finger externally of the housing to pivot with it, a weight joined to and movable with the arm, a switch mounted on the housing and actuatable by the weight, the weight contacting the switch when the finger is in the said second position, and signal means actuated by the contact of the weight with the switch.

2. A feeder for particulate material, comprising a rotatable drum formed with a series of arcuate pockets, a housing, a finger pivotly mounted on the housing and extending therein to swing from a first position which is located externally of one of the said pockets to a second position which is located within the pocket when the pocket is in an upwardly-facing condition and would normally be filled with the said material, the outer end of the finger moving through an arc that approximates the shape of the individual pockets, a lever arm connected

to the finger externally of the housing to pivot with it, a tubular guide mounted on the housing, a weight movable within the guide, a chain joining the weight to the arm so that said weight moves with said arm, a switch mounted on the housing and underlying the weight, the weight contacting the switch when the finger is in the said second position, and signal means actuated by the contact of the weight with the switch.

References Cited in the file of this patent

UNITED STATES PATENTS

1,680,024	Koerner	Aug. 7, 1928
1,873,353	Sperling	Aug. 23, 1932
2,303,226	Olson	Nov. 24, 1942
2,308,146	Baker	Jan. 12, 1943
2,376,079	Orphan	May 15, 1945
2,550,616	Stephano	Apr. 24, 1951
2,914,781	Prutton	Dec. 1, 1959

FOREIGN PATENTS

414,117	Germany	May 23, 1925
497,881	Germany	May 24, 1930