

April 8, 1924.

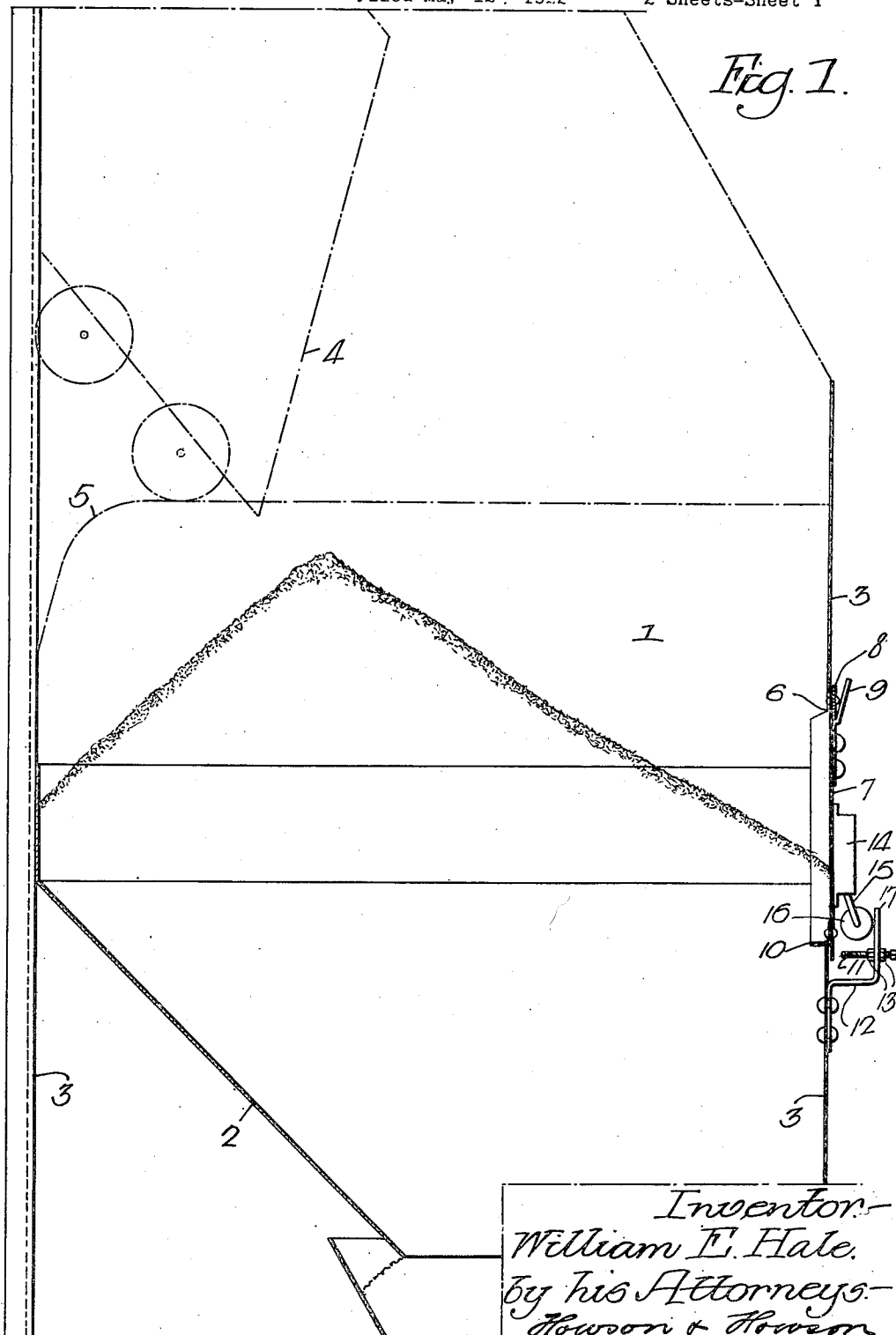
W. E. HALE

1,489,938

MEANS FOR PREVENTING THE OVERFILLING OF HOPPERS

Filed May 12, 1922

2 Sheets-Sheet 1



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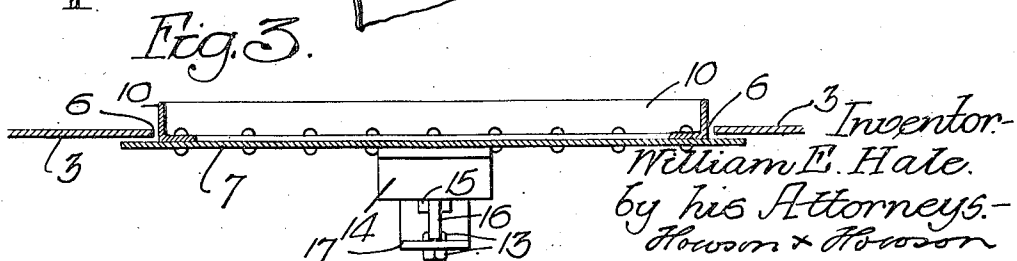
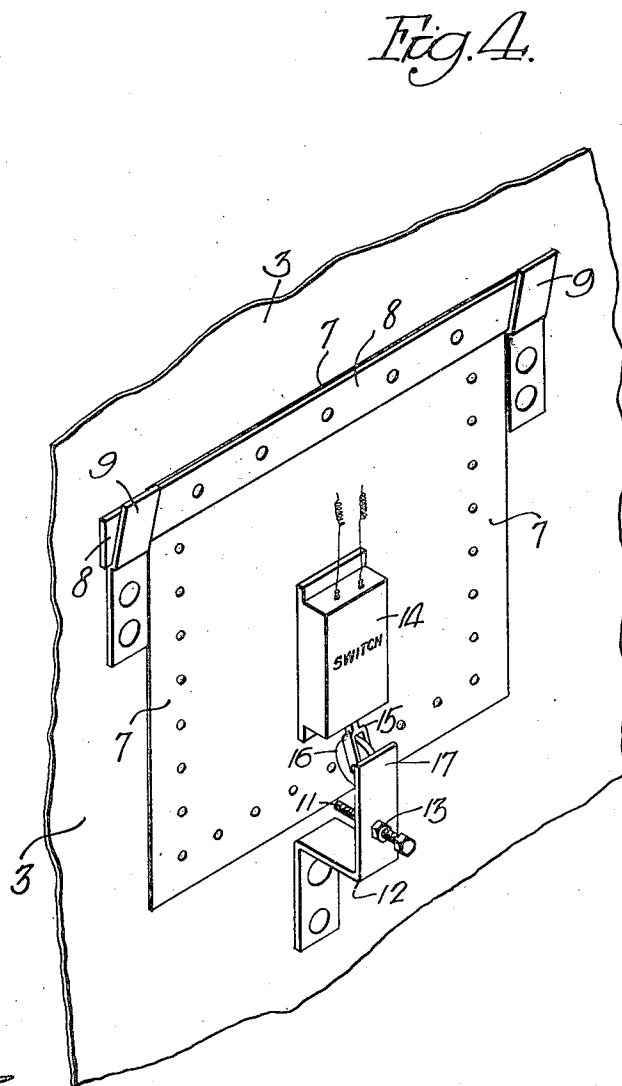
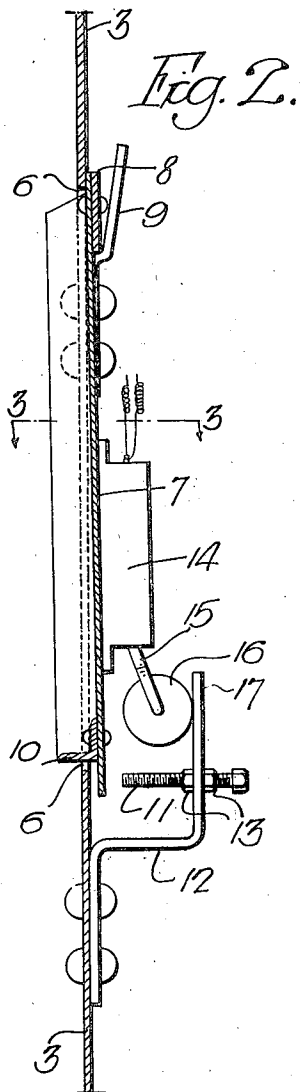
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MEANS FOR PREVENTING THE OVERFILLING OF HOPPERS

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE.

WILLIAM E. HALE, OF FORT WASHINGTON, PENNSYLVANIA, ASSIGNOR TO R. H. BEAUMONT COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

MEANS FOR PREVENTING THE OVERFILLING OF HOPPERS.

Application filed May 12, 1922. Serial No. 560,483.

To all whom it may concern:

Be it known that I, WILLIAM E. HALE, a citizen of the United States, residing in Fort Washington, Montgomery County, Pennsylvania, have invented certain Improvements in Means for Preventing the Overfilling of Hoppers, of which the following is a specification.

My invention relates to certain improvements in hoppers of storage bins for handling coal, ashes, and other granular material.

One object of my invention is to provide means for preventing the overfilling of hoppers.

A further object of the invention is to provide electric mechanism, which is actuated by the material, for cutting off the electric driving mechanism of a skip hoist, or other elevator, that discharges its load into a hopper.

In the accompanying drawings:

Fig. 1 is a sectional view of a hopper of a coal handling plant, showing a skip hoist in dotted lines and illustrating my invention;

Fig. 2 is an enlarged sectional view, showing the detail of the electric stop mechanism;

Fig. 3 is a sectional view on the line 3—3, Fig. 2; and

Fig. 4 is a perspective view, showing the pivoted plate and the electric switch carried thereby.

Referring to the drawings, 1 is the hopper of a coal handling apparatus having an inclined bottom 2 and vertical walls 3. In the present instance, 4 is a skip hoist bucket and 5 is a rail on which the bucket travels. The bucket and rail are shown by dotted lines in Fig. 1. Hoppers are usually located at a considerable distance above the point where the operator is stationed, consequently, it is difficult for the operator to note when the hopper is filled.

By my invention, the electric mechanism, which controls the movement of the skip hoist, or other elevating mechanism, will be automatically stopped when the material in the hopper reaches a certain height.

In one of the side walls 3 of the hopper is an opening 6. Enclosing this opening is a plate 7 attached to a cross bar 8 at the upper end. This cross bar rests on brackets 9 at each side of the opening, as clearly shown in Figs. 2 and 3. The lower end and sides of

the plate are braced by an angle bar 10, in the present instance, and the movement of the plate is controlled by a screw 11, which extends through a bracket 12 secured to the hopper. On this screw are nuts 13 for locking the screw in the position in which it is adjusted.

It will be noted that the angle bars 10 project into the hopper and prevent the escape of the material from the hopper at the bottom and at the sides when the plate is pushed out against the screw by the material in the hopper.

Mounted on the plate 7 is a standard switch 14 having an arm 15 provided with a roller 16, which bears against an extension 17 of the bracket. When the plate 7 closes the opening 6 in the hopper, the switch is in such position that the main electric current will be uninterrupted and the motor, which drives the skip hoist, or other elevating device, will be in operation, the skip hoist elevating the material, which is discharged into the hopper. The skip hoist is usually automatically operated and will continue filling the hopper until the mechanism is stopped.

By installing my improved means for preventing the overfilling of the hopper, the material that is discharged into the hopper, as it increases in height, will bear upon the plate 7, and the pressure of the material will cause the plate to be forced towards the screw 11. This movement will cause the roller 16 of the switch arm to be moved into such position that the contacts in the switch box will be broken. This breaking of the contacts will cause the main switch, which controls the motor that drives the skip hoist, to stop the mechanism.

As soon as the material recedes from the plate, as it is drawn off from the bottom of the hopper, the plate is free to return to its normal closed position. This permits the switch arm 15 to move to its first position, bringing the contact points of the switch together. This movement operates the main switch that controls the motor that drives the skip hoist, so that the skip hoist will be set in motion again to load material into the hopper.

It will be seen that this mechanism is entirely automatic so that the hopper cannot be overloaded.

While the mechanism for filling the hop-

per is described as a skip hoist, it will be understood that any suitable elevating mechanism may be used, which will be under the control of a switch.

5 I claim:

1. The combination of a hopper having an opening at one side; a plate pivotally mounted at the opening and arranged to be forced out by the pressure of material in the hopper; a switch carried by the plate, said switch having an arm; and a stop for shifting the arm when the plate is forced away from the opening by the action of the material in the hopper.

15 2. The combination of a hopper having an opening at one side; a plate pivoted to the outside of the hopper and arranged to close the hopper; a bracket; a set screw therein for limiting the outward movement of the
20 plate; and a controlling switch mounted on

the plate and having an arm bearing against the bracket so that, when the material reaches a given height in the hopper and forces the plate outwards, the plate will come in contact with the screw and the switch arm will be actuated to throw the switch.

3. The combination of a hopper having an opening at one side; a plate pivotally mounted on the outside of the hopper and arranged to close the opening; an adjustable stop for limiting the outward movement of the plate; and a switch arranged to be actuated by the outward movement of the plate, said plate having a flange on the inside extending into the opening so as to prevent the material in the hopper from flowing out of the opening when the plate is forced out by the pressure of material in the hopper.

WILLIAM E. HALE.