To all whom it may concern:

Be it known that we, MARTIN L. BREMIER and ALVIN L. BREMIER, citizens of the United States, residing at Elberon, in the county of Tama and State of Iowa, have invented certain new and useful Improvements in Bin-Filling Shut-Offs; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to warehouse elevators, more especially those used for the storage of grain, and the object of the invention is to provide means for automatically stopping the flow of grain into any particular bin when the same is filled to capacity.

The invention is fully disclosed in the description and claims following reference being had to the accompanying drawing, in which apparatus embodying the invention is shown in a single figure in perspective.

In the drawing, the numeral 5 denotes the shaft of a grain elevator, shown conventionally and greatly reduced in proportionate height. This has suitable feed hoppers 6 leading by short chutes 7 to the lower loop of the conveyor 8. The chutes are provided with vertically sliding gates 9, whereby the flow of grain from the hoppers may be regulated or entirely cut off. The discharge side of the elevator near the top has a chute 10, with an outlet 11 to receive a discharge-pipe 12, by which the grain is dropped into adjacent bins 13. In so far the apparatus is of familiar construction, and need not be particularly described.

The purpose of this invention is to provide means for automatically closing the supply gates, so that the attendant is not obliged to spend time needlessly in climbing to the top of the building and watching the filling of bins to prevent an overflow.

In the path of the discharging grain, preferably in the chute 10 is mounted a paddle 14, pivoted to a support 15, and adapted to swing upwardly as the chute fills with grain backed up from the discharge-pipe. To the upper end of the paddle-lever 14 is connected a rod 16, or the like, which on the lifting of the paddle serves to close an electric switch 17 in circuit with an electro-magnet 18, which trips the automatic apparatus now to be described.

The upper part of the gate is provided with a tail 9, and against this on one side is fixed an abutment 19. On the opposite side of the tail is pivoted a pressure-block 20, faced with leather 29. This supports the gate frictionally when held in place by a cam-lever 21. A hand-lever 22 and its link 23 serve for manipulating the gate by hand. On the face of the elevator shaft at right angles to the lock-lever 21 is pivoted a trip lever 24, which dropping by gravity strikes the lock-lever, and thus releases the gates and this by its own gravity drops and shuts off the flow of grain. The trip lever is held normally nearly erect by a latch 25, 70 which is the armature of the magnet above referred to. Both the trip-lever and the latch are of metal, and when in normal position form a part of the electric circuit, as will appear presently.

A dry battery 26 supplies the current. This connects at one side with the trip-lever or its pivot by a conductor a. Another conductor b connects the latch with the magnet coil at one end. The other end connects by a conductor c with one terminal of the switch 17. Its other terminal connects by a conductor d with the other side of the battery. In this leg of the circuit may be interposed a hand-switch 27, for convenience, and in order to give audible warning of the action of the apparatus, a bell 28 is placed in circuit, as indicated.

The operation of the apparatus will be evident. Instantly, on the abnormal lifting of the grain-level paddle, the elevated gate is released, and drops to position to stop the flow of grain into the elevator. The sounding of the alarm at the same time notifies the attendant of the filling of that bin. He may be completely occupied at the time with other matters, but is not obliged to rush with all possible haste to stop the flow of grain, and thus prevent an overflow above. At his convenience, and without any stoppage of machinery, he may go aloft, adjust the discharge-pipe for another bin, and then reset the gate and its tripping mechanism as before.

In the case of an elevator provided with a double hopper supply, which is a common construction, the gate-supporting mechanism is duplicated, as also the trip-lever and its supporting latch. It is not necessary, however, to provide another releasing magnet, since the auxiliary latch 25a for the other trip-lever 24a may connect by a rod 29 with...
a short arm 24 of the primary trip-lever, and the single magnet serve for the release of both trip-levers almost simultaneously.

Having thus described our invention, we claim:

1. Combined with bin-filling mechanism, a switch-closer actuated by the rise of grain, a gate to regulate the flow of material to the bin-filler, means adapted to hold the gate in open position, trip-mechanism to release the gate-holder, a magnet-actuated latch therefor, a source of electrical energy, and a magnet in circuit therewith and with the switch.

2. Combined with an elevator and its bin-filling outlet, an electric-switch closer actuated by the rise of grain, a gate adapted to shut off the flow of grain to the elevator, means to hold the gate in open position, a gravity trip-lever to release the same, a magnetically actuated latch to hold the trip-lever in normal position, a source of electrical energy, and a magnet in circuit therewith and with the switch, and adapted when energized to release said latch.

3. Combined with an elevator and its bin-filling outlet, an electric-switch closer actuated by the rise of grain in the outlet, a gravity gate adapted to shut off the flow of material to the elevator, a lock-lever to support the gate frictionally, and disposed in the path of a gravity trip-lever, a trip-lever, a latch therefor, a magnet adapted to release said latch, a source of electrical energy, and a switch, closed as aforesaid, and an alarm-sounder in circuit with the magnet and said source of energy.

4. Combined with an elevator, a shut-off gate, means to hold the gate suspended frictionally, a lock-lever therefor, a trip-lever to release the lock-lever, a latch to hold the trip-lever normally, a magnet to release said latch, a source of electrical energy, a connection of the magnet therewith through the trip-lever and latch, a switch in the electrical circuit, and means operable by the rise of material as discharged by the elevator, to close said switch.

5. Combined with an elevator having plural supply inlets and shut-off gates therefor, means to hold said gates open, a releasing trip-lever for each, and retaining latches, a connection of one such trip-lever with the latch of the other trip-lever, an electro-magnet to release the other latch, a switch in the magnet circuit, and means actuated by the rise of the discharged material from the elevator to close said switch.

In testimony whereof we affix our signatures in presence of two witnesses:

MARTIN L. BREMER,
ALVIN L. BREMER,

Witnesses:

PHILIP J. SEVCIK,
LOUIS L. STRANSKY.