

M. W. HARVEY.
 AUTOMATIC GATE FOR MINE ELEVATOR SHAFTS.
 APPLICATION FILED APR. 15, 1912.

1,055,633.

Patented Mar. 11, 1913.

2 SHEETS-SHEET 1.

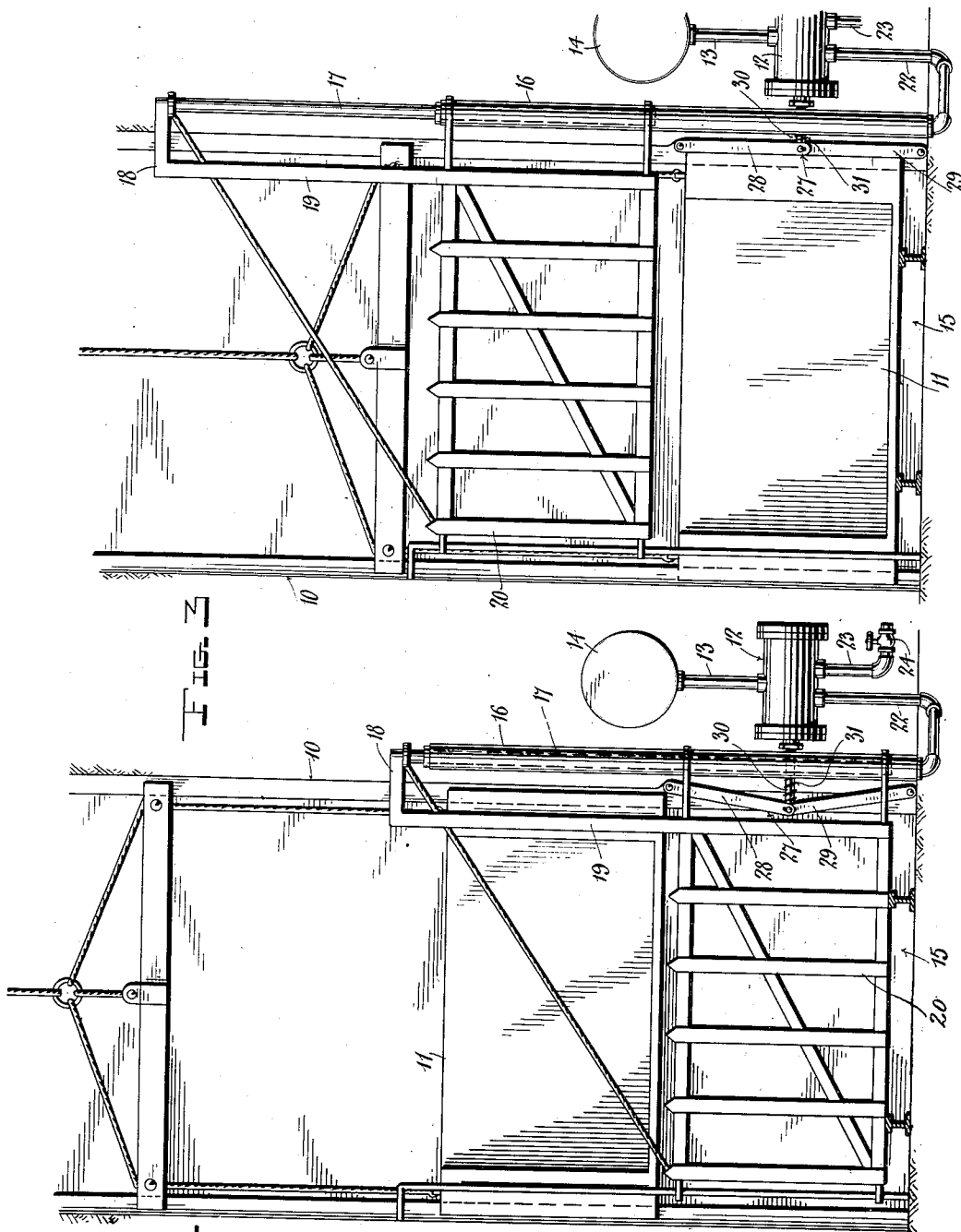


FIG. 1

FIG. 2

Witnesses
J. H. Brown
Harry M. Test

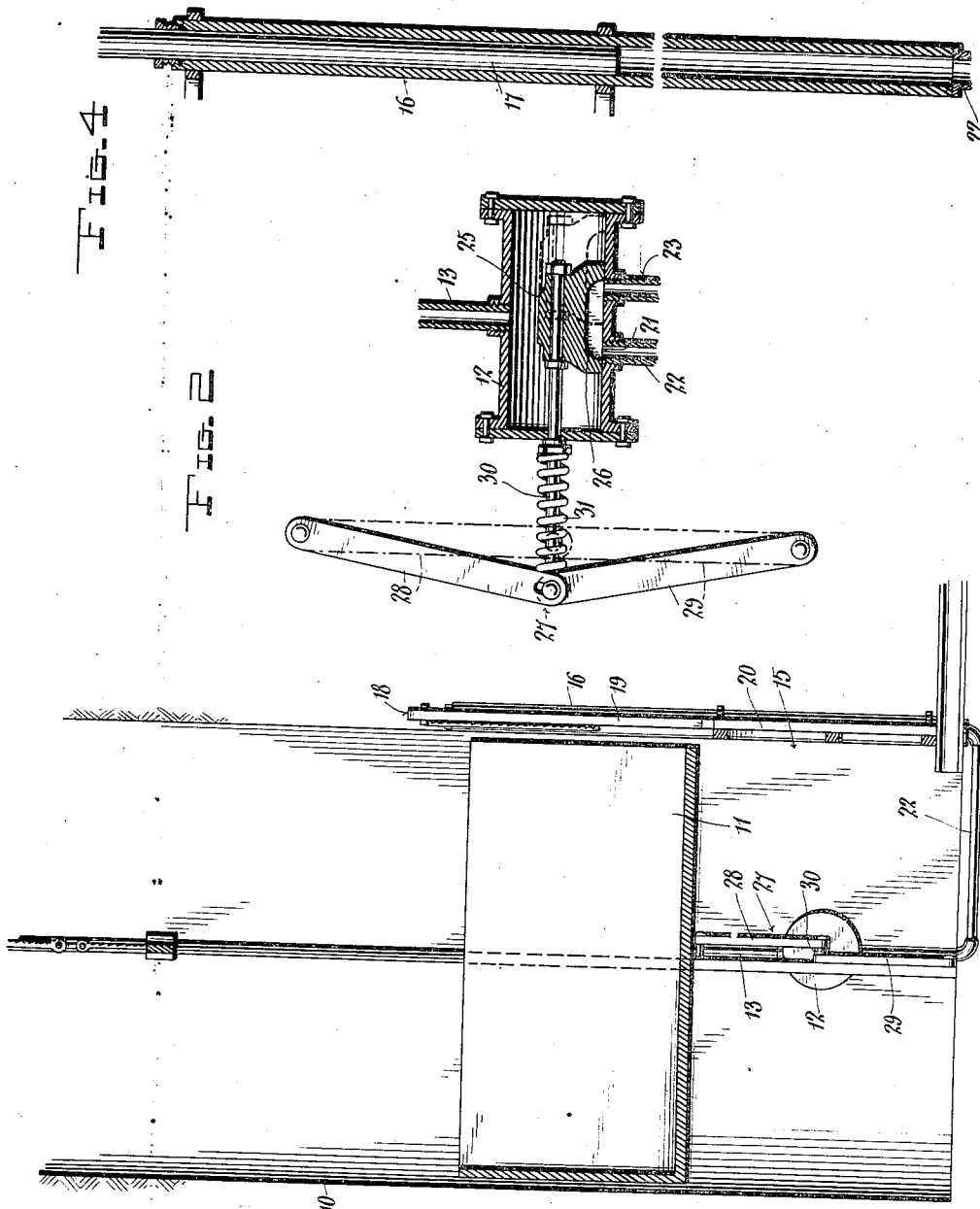
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UNITED STATES PATENT OFFICE.

MILLSOME W. HARVEY, OF SYKESVILLE, PENNSYLVANIA.

AUTOMATIC GATE FOR MINE ELEVATOR-SHAFTS.

1,055,633.

Specification of Letters Patent. Patented Mar. 11, 1913.

Application filed April 15, 1912. Serial No. 691,001.

To all whom it may concern:

Be it known that I, MILLSOME W. HARVEY, a citizen of the United States, residing at Sykesville, in the county of Jefferson, State of Pennsylvania, have invented certain new and useful Improvements in Automatic Gates for Mine Elevator-Shafts; and I 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 improvements in mine elevator shafts, and has particular reference to a device for automatically opening the gate, by means of the elevator, when the same reaches the landing.

One object of the invention is to provide a fluid actuated means, which will be quickly opened upon operation of the controlling device, to raise the gate, said gate being permitted to slowly settle into place, by a regulating means.

Other objects and advantages will be apparent from the following description and with particular reference to the accompanying drawings.

In the drawings: Figure 1 is a vertical section through the lower portion of the main elevator shaft showing my invention applied, Fig. 2 is an enlarged sectional detail of the pressure chest, Fig. 3 is a view similar to Fig. 1 showing the gate opened, certain of the parts being shown in section, and Fig. 4 is an enlarged detail view of the pressure cylinder for raising the gate. Fig. 5 is a vertical sectional view through the elevator shaft.

Referring particularly to the drawings, 10 represents the mine elevator shaft, in which travels the elevator cage 11. Located at the landing of the shaft is a chest 12, having the pipe 13 leading into the upward central portion thereof, which is connected to the supply of fluid under pressure as indicated at 14. Disposed at one side of the gate-way 15 of the elevator shaft is a vertically disposed pressure cylinder 16, in which is slidably arranged the arm 17 of a yoke 18, the arm 19 of said yoke having secured thereto the gate 20. Leading into the bottom of the cylinder 16, and communicating at 21 with the chest 12 is a pressure conveying pipe 22. The pipe 22 is connected to the bottom of the chest, and at a suitable distance therefrom is con-

nected another pipe 23, having on its outer end a controlling valve 24 which end of the pipe is open to the atmosphere. In the chest is a slide valve 25, having a concavity 26 in its bottom, said valve being slidable over the openings in which the pipes 22 and 23 are attached. Mounted on the side of the shaft is a trip 27 which consists of a pair of links 28 pivoted together at their inner ends and at their outer ends pivotally attached to the elevator shaft.

The valve 25 has a piston rod 30, suitably attached at one end thereto, the opposite end of the rod being pivotally connected to the link 28, a suitable coil spring 31 encircling the piston rod between the said link and the end of the chest. This spring has a normal tendency to hold the valve in one limit of its movement, and to also hold the links extended into the path of the car or mine cage to be tripped thereby, when the same descends the shaft.

In the operation of the device, a constant pressure of compressed fluid flows from the supply into the chest, and the valve is in the position as shown in Fig. 1. When the elevator cage is near the bottom of the shaft, the cage engages with the links 28 and pushes them inwardly which forces the valve to the opposite limit of its movement, thus uncovering the opening leading to the pipe 22, and permitting the fluid under pressure to pass from the chest through said pipe and into the cylinder 16. This pressure of the fluid raises the piston in the cylinder, and lifts the gate so that the gateway 15 is open, to permit the passage of the coal car on to the cage. When the cage has ascended above the trip the spring will have a tendency to force the trip outwardly and pull the valve into its normal position as indicated in Figs. 1 and 2. This position, as clearly seen, causes the concavity 26 to cover both the openings in the bottom of the chest, and thus permit the air which is in the cylinder 16 to flow back through the pipe 22, through the concavity of the valve, and out through the pipe 23, the weight of the gate assisting in forcing the air out. To regulate the speed at which the gate shall drop, the valve 24 is opened or closed to the proper degree, thus permitting the air to escape rapidly or slowly and the gate to drop quickly or settle slowly as desired.

What is claimed is:

1. An automatic gate for an elevator shaft

comprising a pressure cylinder, a yoke having one arm disposed in the cylinder and forming a piston, a gate, the other arm of the yoke being secured to the gate, a source of supply of fluid under pressure, a chest connected to said supply, a slide valve in the chest, a trip adapted to be engaged by the elevator car, said trip comprising pivotally connected links projecting in the path of the elevator car, a piston rod on the valve connected to said links, a coil spring on the rod between the links and the chest, connections between the chest and the cylinder, a pipe in the chest leading to the atmosphere, said valve having a concavity normally covering the outlet and the connections to the cylinder whereby the air from the cylinder will escape to the atmosphere.

2. An automatic gate for an elevator shaft comprising a pressure cylinder, a yoke having one arm disposed in the cylinder and forming a piston, a gate, the other arm of the yoke being secured to the gate, a source of supply of fluid under pressure, a chest

connected to said supply, a slide valve in the chest, a trip adapted to be engaged by the elevator car, said trip comprising pivotally connected links projecting in the path of the elevator car, a piston rod on the valve connected to said links, a coil spring on the rod between the links and the chest, connections between the chest and the cylinder, a pipe in the chest leading to the atmosphere, said valve having a concavity normally covering the outlet and the connections to the cylinder whereby the air from the cylinder will escape to the atmosphere, and a valve in the pipe leading to the atmosphere for controlling the exhaust of the fluid, whereby the closing speed of the gate is regulated.

In testimony whereof, I affix my signature, in presence of two witnesses.

MILLSOME W. HARVEY.

Witnesses:

V. R. HOLMAN,
Mrs. J. L. SHAFFER.