

W. H. TSCHANTZ.
MINE GATE.

(Application filed Feb. 3, 1899.)

(No Model.)

3 Sheets—Sheet 1.

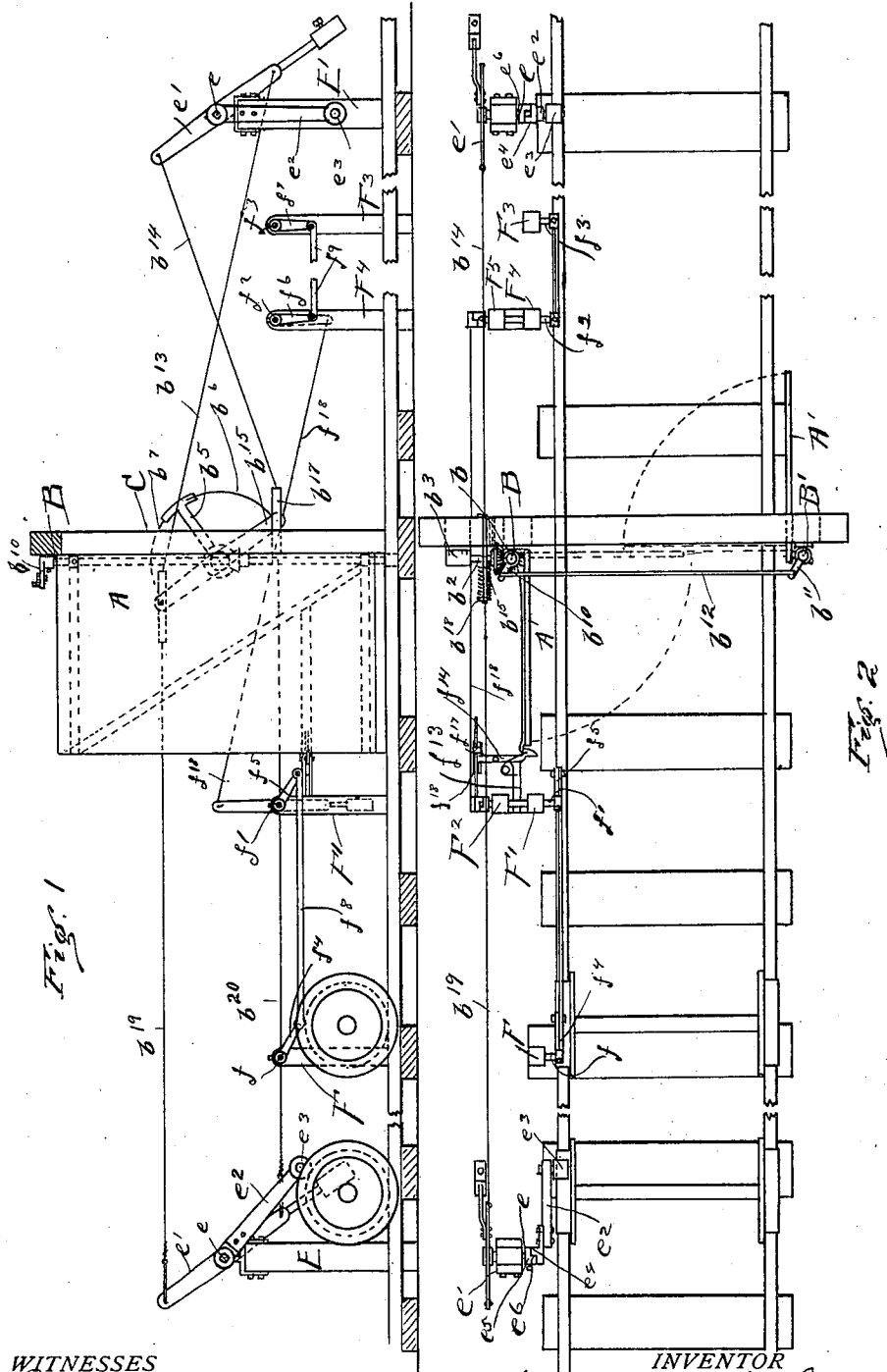


Fig. 1

Fig. 2

WITNESSES
Geo. Hillen
Chas. M. Ball

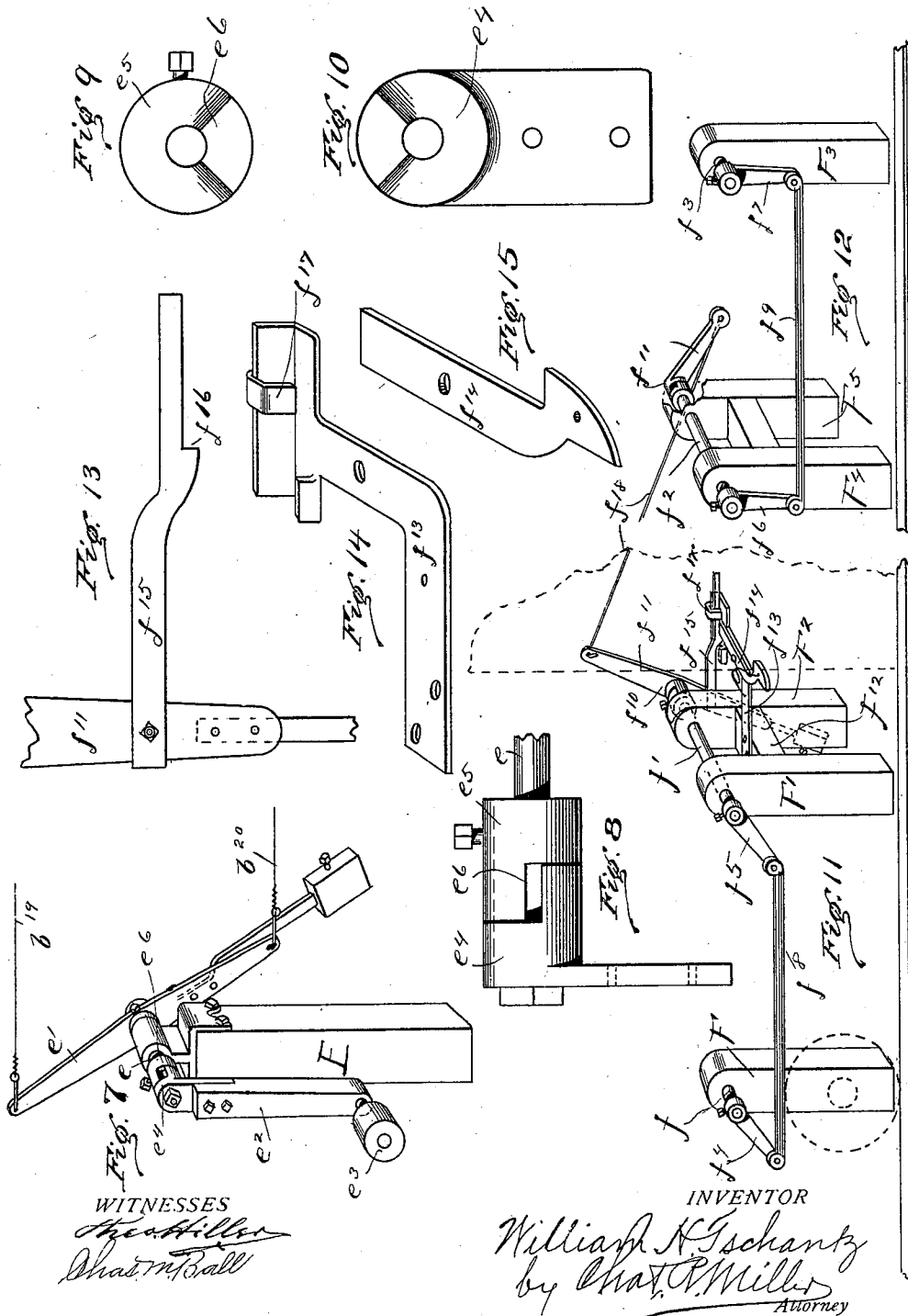
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INVENTOR
William H. Tschantz
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UNITED STATES PATENT OFFICE,

WILLIAM H. TSCHANTZ, OF ORRVILLE, OHIO.

MINE-GATE.

SPECIFICATION forming part of Letters Patent No. 639,629, dated December 19, 1899.

Application filed February 3, 1899. Serial No. 704,348. (No. model.)

To all whom it may concern:

Be it known that I, WILLIAM H. TSCHANTZ, a citizen of the United States, residing at Orrville, in the county of Wayne and State of Ohio, have invented new and useful Improvements in Mine-Gates, of which the following is a specification.

My invention relates to improvements in mine-gates; and it consists of certain novel features of construction and combination and arrangement of parts whereby the gates, which are automatically operated by the passing cars, present the least possible resistance to the air, and are therefore more quickly and easily operated, as will be hereinafter more fully described and claimed.

In the accompanying drawings similar letters of reference refer to similar parts.

Figure 1 is a sectional view showing the relative position of the parts when the gates are opened. Fig. 2 is a top plan view of the same. Fig. 3 is a side elevation of the vertical shaft carrying the gates and the plain bevel-gear by which the same are operated. Fig. 4 is a front elevation of the same. Fig. 5 is a side elevation of the bevel gear-wheels and the arms by which they are operated. Fig. 6 is a top view of the guideway and traveling bar by which the gates may be operated when hinged together in the center. Fig. 7 is a perspective view of one of the operating-levers. Fig. 8 is a front view of the upper portion of one of said levers, showing the method of engagement with the shaft. Figs. 9 and 10 are plan views of the faces of the oscillating-clutch engagement of the operating-levers with the shaft. Figs. 11 and 12 are perspective views of the latch mechanism for engaging and releasing the gates. Figs. 13, 14, and 15 are detail views of the latching device.

The gates A and A' are carried by two vertical shafts B and B', journaled upon supporting-posts C and C', sunk in the ground upon the sides of the track. To the middle of the shaft B there is attached by means of a thumb-bolt a bevel gear-wheel b, which meshes with a correspondingly partially geared wheel b', carried upon a shaft b², journaled in a box b³, secured to the vertical post, and a box b⁴, mounted upon the vertical shaft B. To the shaft b², carrying the partially-geared wheel b', there is attached a spacing-bar b⁵, having

bolted to the free ends thereof bars b¹⁶ and b¹⁷, to which are attached the wires which communicate with and are attached to the various operating-levers, hereinafter more fully described, the wires heretofore referred to being attached to sliding bolts passing through holes in the upturned ends of the bars b¹⁶ and b¹⁷ and preferably cushioned by coiled springs. To the partially-bevel-gear wheel b' there is securely bolted a lever b⁵, which is T-shaped in form, carrying rods b⁶ and b⁷, which pass through loops b⁸ and b⁹ on the end of the spacing-bar b¹⁵, one of which rods has mounted upon it a coiled spring b¹⁸, which acts as a spring-check against sudden impulse.

Bolted to the tops of the vertical shafts B and B' are crank-levers b¹⁰ and b¹¹, coupled by means of a connecting-rod b¹², which causes the oppositely-disposed overlapping gates to move in opposite directions, dividing the resistance caused by the air and permitting of their more rapid operation.

When the gates are hinged together in the center, as shown in Fig. 6, there is provided a trackway D, attached to the top of the gate-frame, and a post at the side of the track, which acts as a guide for the traveling bar d, bolted at its other end to the gate. When this form is employed, the shaft B' is done away with, together with the crank arms or levers b¹⁰ b¹¹ and the connecting-bar b¹². The operation of the vertical shaft B causes the gates to swing out and in, folding one upon the other, and vice versa.

On the side of the track upon which there is located the shaft B and at a suitable distance from the gates there are provided posts E and E', upon each of which there is journaled in any suitable manner a shaft e, to the outer end of which there is bolted the weighted bar e', to the ends of which are attached wires b¹⁹ and b²⁰ and b¹³ and b¹⁴. Upon the inner end of each shaft and loosely journaled thereon is the operating-lever e², having at its lower end a roller e³ to engage the wheels of the cars as they pass along the track. The upper end of the depending lever e² is provided with an extension or lug e⁴, having engagement with a corresponding lug e⁶ upon a sleeve e⁵, secured to the shaft e by means of a thumb-bolt, thus forming a clutch which becomes operative only when the depending

operating-lever has been raised to the proper height and prevents any sudden jar or strain which might be caused by the rapid contact of the car-wheels therewith. To the end of the weighted bar e' , attached to the shaft journaled on the post E' , there are attached the connecting-wires b^{13} and b^{14} , which cross and are attached to the ends of the spacing-bar b^{15} . The purpose of crossing these wires is to reverse the motion, so that a car passing one of the depending operating-levers would cause the gates to open, and passing the other depending operating-arm would cause the motion to be reversed and the gates closed.

For the purpose of providing a positive latch, by means of which the gates are held open while the cars are passing through and are in turn released when the last car shall have passed through, I provide the mechanism shown in Figs. 11 and 12. On opposite sides of the gate-supporting frame and adjacent to the track are planted posts F , F' , and F^2 and posts F^3 , F^4 , and F^5 , and journaled in or upon these posts are shafts f and f' and shafts f^2 and f^3 , to which, on the inner ends thereof and next to the rail, there are bolted depending operating levers or arms f^4 and f^5 and f^6 and f^7 , coupled together by connecting-rods f^8 and f^9 to engage with and be carried upward by the rim of the car-wheels. Upon the outer ends of the shafts f' and f^2 are loosely journaled the oscillating clutch-levers f^{10} and f^{11} , similar in construction to those heretofore described. Mounted upon the brace f^{12} , connecting the posts F' and F^2 , there is bolted an L-shaped frame f^{13} , to which there is pivotally attached the latch f^{14} . To the lever f^{11} there is pivotally attached the actuating-bar f^{15} , having a sliding engagement with the latch f^{14} by means of the projection f^{16} and held in position by means of a lip f^{17} , turned down upon the supporting-frame f^{13} . To the outer end of the latch f^{14} there is attached a U-shaped spring, the other end of which is engaged with the L-shaped frame f^{13} . The oscillating clutch-levers are connected by means of the wire f^{18} , through which the power is transmitted to the latching device.

It will be observed that each of the operative levers and spacing-bars has the oscillating-clutch connection with the shaft upon which it is mounted, and by means of the sleeves, adjustable on the shaft, they can be so set as to permit the levers to become operative only in one direction and to take up the jar of any sudden contact.

In operation, the gates being closed and the car passing along the track, the wheels thereof come in contact with the first depending operating-lever and cause it to pass up and over the rim of the wheel, the motion being transmitted by means of the spacing-bar to the bevel gear-wheels, which cause the gates

to swing open. One of them engages with the spring latching device, and they are thus held open until the last car passes the connecting bars or rods on the opposite side, when the same drop down, transmitting the motion to and releasing the spring-catch and disengaging the gates, which are again closed by means of the weighted spacing-bar swinging down into its normal position and transmitting the motion through the wires to the bevel gear-wheels.

Having thus fully described my invention, what I desire to claim and secure by Letters Patent is--

1. In a mine trap-door, the combination of oppositely-disposed gates mounted upon vertical shafts, provided with crank-levers coupled together, depending oscillating clutch-levers journaled at the side of the track, and upon both sides of the gates, a bevel-gear train communicating with one of the vertical shafts, and wires connecting the gear-train with the oscillating clutch-levers, substantially as described and for the purpose set forth.

2. In a mine trap-door, the combination of oppositely-disposed gates mounted upon vertical shafts coupled together, with depending oscillating clutch-levers journaled at the side of the track, and upon both sides of the gates, a bevel-gear train communicating with one of the vertical shafts, wires connecting the gear-train with the oscillating clutch-levers, a spring-actuated latching device mounted at the side of the track, and means for disengaging the same, substantially as described and for the purpose set forth.

3. In a mine trap-door, the combination of a gate mounted upon a vertical shaft with the depending oscillating clutch-levers journaled at the side of the track, and upon both sides of the gate, a bevel-gear train communicating with the vertical shaft, and wires connecting the gear-train with the oscillating levers, substantially as described and for the purpose set forth.

4. In a mine trap-door, the combination of a gate mounted upon a vertical shaft with the depending oscillating clutch-levers journaled at the side of the track, and upon both sides of the gate, a bevel-gear train communicating with the vertical shaft, wires connecting the gear-train with the oscillating clutch-levers, a spring-actuated latching device mounted at the side of the track, and means for disengaging the same, substantially as described and for the purpose set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

WILLIAM H. TSCHANTZ.

Witnesses:

CHAS. R. MILLER,
CHAS. M. BALL.