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F. ZOERKLER.

DOOR OPENER AND CLOSER FOR MINES.

APPLICATION FILED SEPT. 16, 1905.

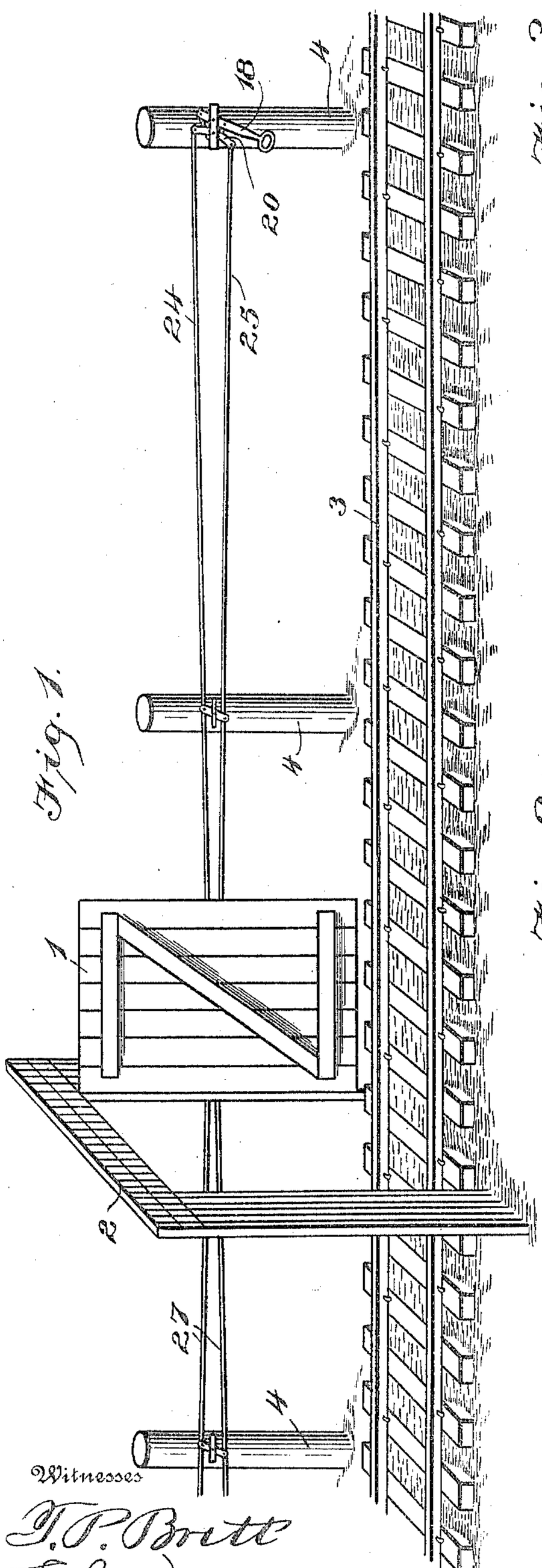

Fig. 1.

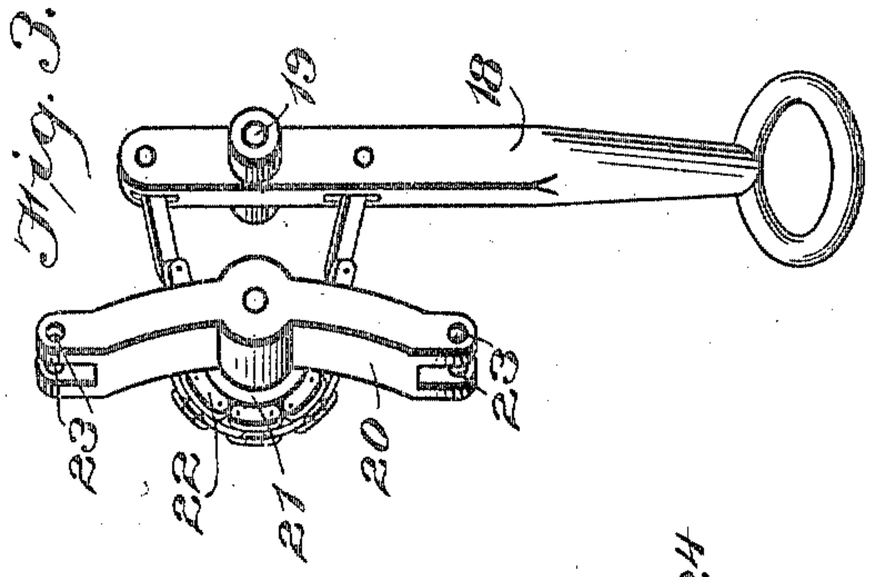

Fig. 3.

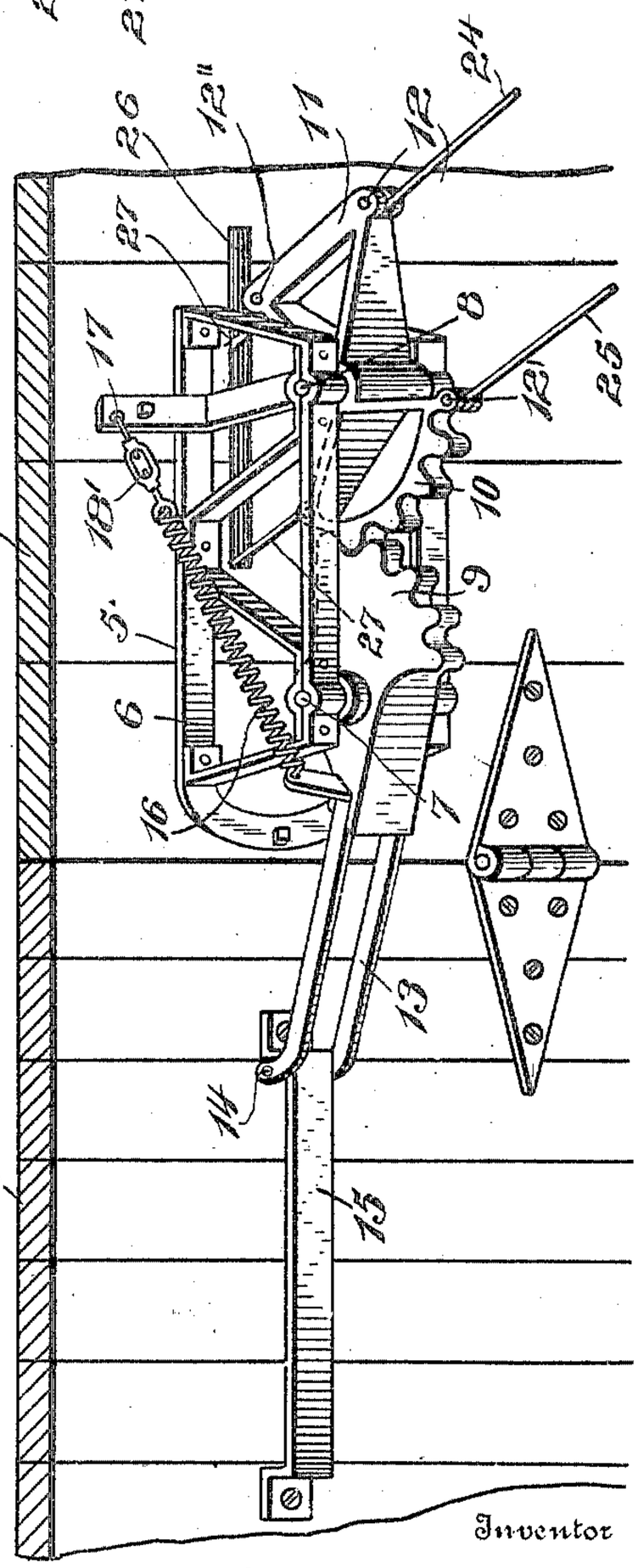

Fig. 2.

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FRANK ZOERKLER, OF FRYBURG, PENNSYLVANIA.

DOOR OPENER AND CLOSER FOR MINES.

No. 811,890. Specification of Letters Patent. Patented Feb. 6, 1906.

Application filed September 16, 1905. Serial No. 278,723.

To all whom it may concern:

Be it known that I, FRANK ZOERKLER, a citizen of the United States, residing at Fryburg, in the county of Clarion and State of Pennsylvania, have invented certain new and useful Improvements in Door Openers and Closers for Mines; and I do 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, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to devices for opening and closing gates in mines, and has for its object to provide a device whereby the gates may be opened or closed by the drivers of mine-cars before the car reaches the gate, thus saving time and allowing the car to pass through without stopping.

With this object in view my invention consists in the novel construction of the gate-operating apparatus and in certain combinations of parts, which will be first fully described and afterward specifically pointed our in the appended claims.

Referring to the accompanying drawings, Figure 1 is a view showing mine-gate and track for mine-car. Fig. 2 is a perspective view of part of the mine-gate-operating device. Fig. 3 is a perspective view of operating-lever.

Like numerals of reference indicate the same parts throughout the several figures, in which—

1 indicates a mine-gate; 2, the gate-casing; 3, the track for mine-cars passing through the gate, and 4 indicates a series of posts arranged as shown in Fig. 1.

5 indicates the gate-operating device, which comprises a bracket 6, securely fastened to the casing of the gate, said bracket supporting two vertical posts 7 and 8. Journaled or pivoted on said posts are two toothed segments or members 9 and 10, the segment 10 being provided with a triangular extension 11, the extreme corners of said segment and extension being provided with perforations 12, 12′, and 12″, as shown in Fig. 2. Secured to the segment 9 is a yoke 13, the outer pin 14 thereof traveling behind a strap 15, secured to the front of the gate 1.

16 indicates a spring, which is connected to the segment 9 at a point forward of its pivoted point, said spring extending diagonally across the bracket 6, to which it is connected at 17 by means of a turnbuckle 18′, which is employed for the purpose of adjusting the tension of the spring.

Located on one of the posts 4 at a convenient distance from the gate is the operating-lever 18, which is fulcrumed to the post at 19. Connected to said lever, as shown in Fig. 1, is a lever 20, which is provided with a sprocket 21, over which a chain 22 passes, the ends of said chain being connected to the operating-lever 18, as shown in Fig. 3. The said lever 21 is provided with a perforation 23 at each end thereof, and the said ends are bifurcated, as shown, in order to accommodate wires, cables, or rods 24 and 25, as shown in Fig. 1. The upper wire, cable, or rod 24 connects with the outside perforation 12 in the triangular extension 11 on the segment 10, while the lower wire, cable, or rod 25 connects with the outside perforation 12′ in the segment 10.

26 indicates a slot in the gate-casing under the bracket 6, through which the wires, cables, or rods 27 pass, said wires, cables, or rods 27 connecting with the segment 10 and triangular extension 11 and passing to a lever 20 and an operating-lever 18, which is a duplicate of Fig. 3, but is not shown in Fig. 1.

Having thus described my invention, its operation is as follows: When the door or gate is closed and a car is approaching the same, the driver grasps the operating-lever 18 and pulls the same in the direction the car is moving. This throws the lever 18 into position shown in Fig. 1 and draws the upper wire, rod, or cable 24 in the opposite direction. Said wire, rod, or cable being connected to the triangular extension 11 on the segment 10 rotates said segment, which transmits its movement to the segment 9, causing the yoke 13 thereon to act on the strap 15 and open the door or gate. As the door or gate is opened the point of connection of the spring 16 on the segment 9 is carried forward of the pivoted point of the segment, and as the spring is of compression strain it assists in opening the door or gate and holds the door or gate in an open position. After the car passes through the door or gate the driver grasps the operating-lever 18 (not shown in Fig. 1) and pulls it in the direction the car is moving. This causes the upper wire, rod, or cable 27 to draw the triangular extension 11 on the segment 10 in the opposite direction, which moves the segments 9 and 10 into position shown in Fig. 2 and closes the door or

gate. When the door or gate is closed, the point of connection of the spring 16 on the segment 9 is carried over the pivoted point of said segment, as shown in Fig. 2, and the said spring assists in closing the door or gate and holds the door or gate closed.

Having thus fully described my invention, I do not wish to be understood as limiting myself to the exact construction herein set forth, as various slight changes may be made therein which would fall within the limit and scope of my invention, and I consider myself clearly entitled to all such changes and modifications.

What I claim as my invention, and desire to secure by Letters Patent of the United States, is—

1. In a device for opening and closing gates, the combination of a bracket, a segment carried thereby and provided with means for connection with a gate, a second segment carried by said bracket and arranged to mesh with said first-mentioned segment and provided with suitable connecting wires, cables or rods to operate the same, and a spring connected to said first-mentioned segment to assist in opening and closing the gate, substantially as described.

2. In a device for opening and closing gates, the combination of two pivoted members arranged to mesh with each other, one of said members being provided with means for connection with a gate, the other of said pivoted members being provided with a suitable connecting wire, cable or rod, and a spring connected to the first-mentioned member to assist in opening and closing the gate, substantially as described.

3. In a device for opening and closing gates, the combination of two pivoted members provided with teeth and arranged to mesh with each other, means for connecting one of said members to a gate, the other of said members being provided with a connecting wire, cable or rod, a spring connected to said first-mentioned member to assist in opening and closing the gate, and means remote from said pivoted members for operating the same, substantially as described.

4. In a device for opening and closing gates, the combination of two pivoted toothed members arranged to mesh with each other, one of said members being provided with means for connection with a gate, the other of said pivoted members being provided with a connecting wire, cable or rod, and an operating device remote from said members arranged to operate the same through the medium of said wire, cable or rod, substantially as described.

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

FRANK ZOERKLER.

Witnesses:
MAURICE SCHUPP,
JOSEPH FLETCHER.