No. 686,201. Patented Nov. 5, 1901.

W. W. BRADLEY.

MINE DOOR OPERATING MECHANISM.

(Application filed May 31, 1901.)

(No Model.) 2 Sheets—Sheet 1.

FIG. 1.

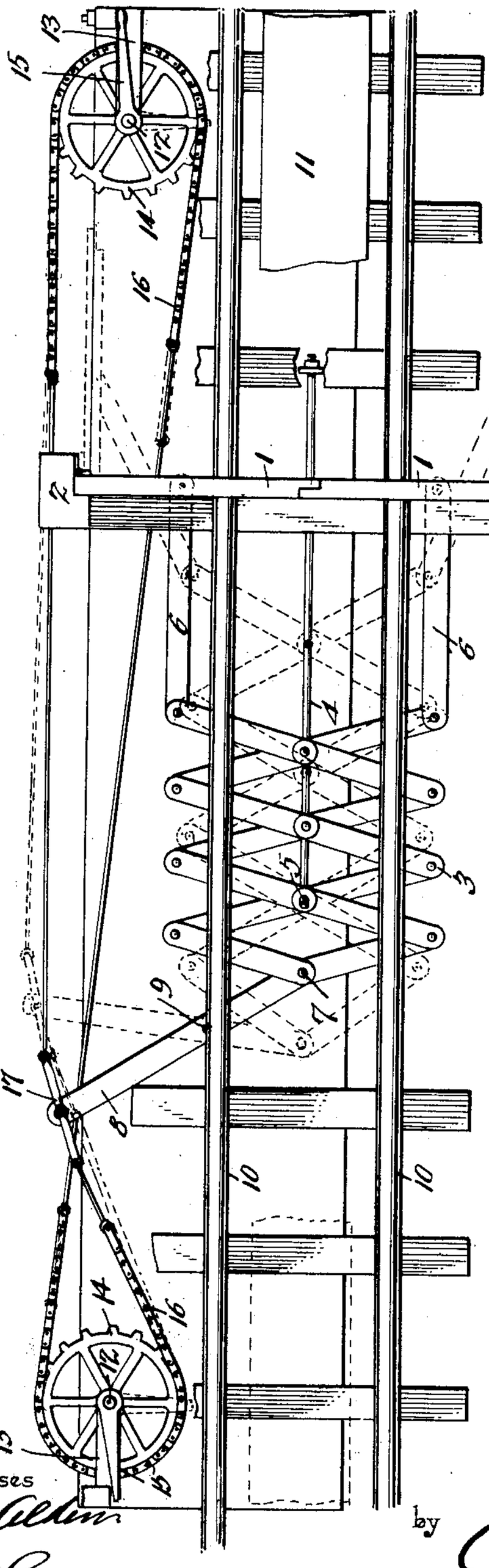
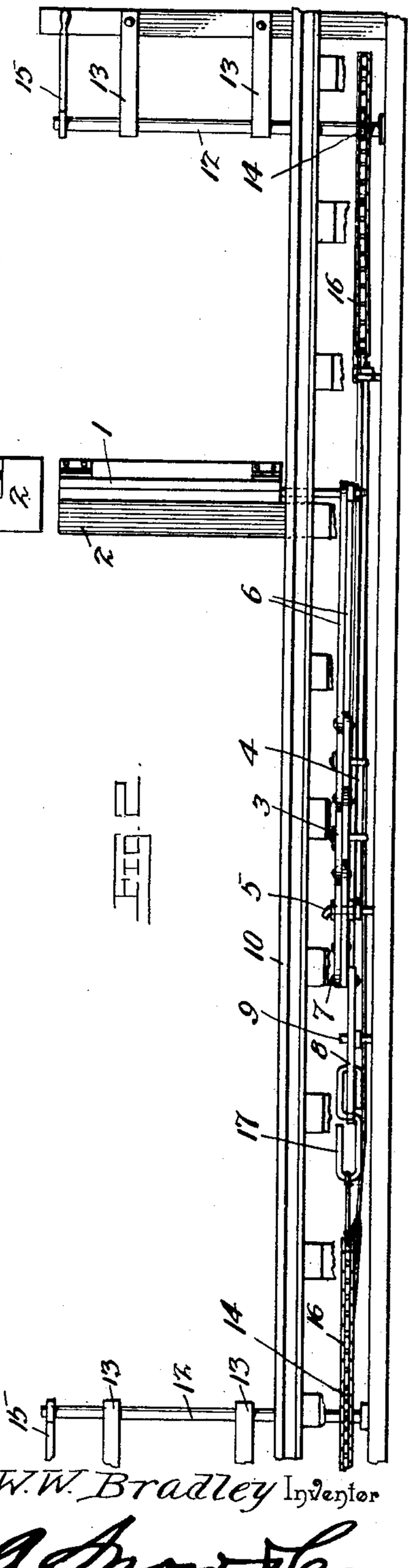


FIG. 2.



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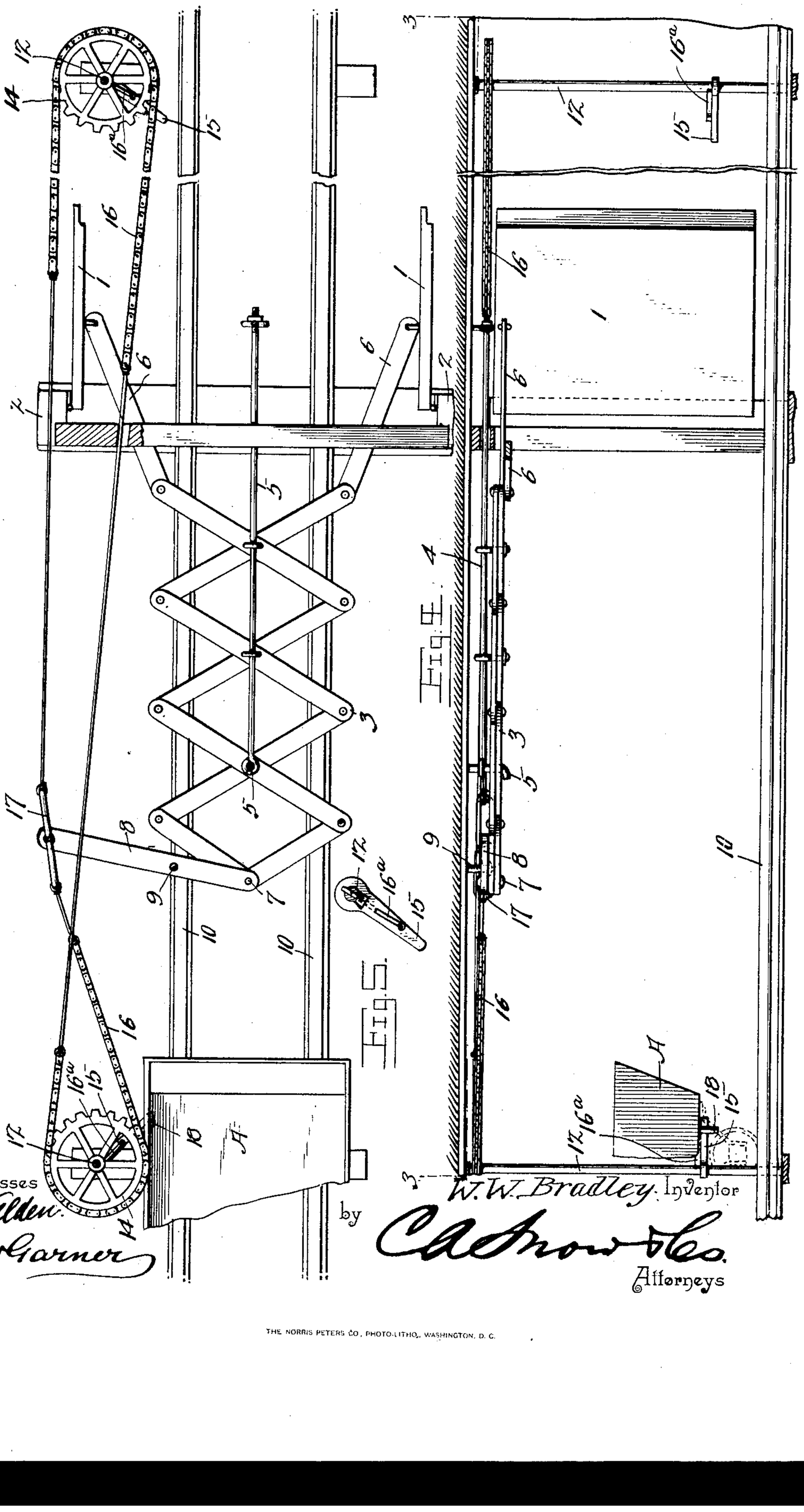

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

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UNITED STATES PATENT OFFICE.

WILLIAM W. BRADLEY, OF MONTGOMERY, WEST VIRGINIA.

MINE-DOOR-OPERATING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 686,201, dated November 5, 1901.

Application filed May 31, 1901. Serial No. 62,616. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM W. BRADLEY, a citizen of the United States, residing at Montgomery, in the county of Fayette and State of West Virginia, have invented a new and useful Mine-Door-Operating Mechanism, of which the following is a specification.

My invention is an improved mine-door-operating mechanism, by means of which a mine-door may be opened as the same is approached from a distance and closed after the door has been passed by the driver of a tram-car without the necessity of alighting from the car and while the same is in action, thereby dispensing with the employment of an attendant at the mine-door to open and close the same; and my invention consists in the peculiar construction and combination of devices hereinafter fully set forth and claimed.

In the accompanying drawings, Figure 1 is a top plan view of a mine-door provided with operating mechanism constructed in accordance with my invention. Fig. 2 is a side elevation of the same. Fig. 3 is a top plan view of a modified form of my invention. Fig. 4 is an elevation, partly in section, of the same. Fig. 5 is a detail view of a portion of one of the operating-shafts, showing an operating-lever having lost motion thereon and a spring to dispose said lever normally in the path of a tappet carried by a car for automatically opening and closing the doors.

The mine-door in the embodiment of my invention here shown comprises the leaves 1, which are hinged at their outer sides to the posts 2. On one side of the door, in the way approaching the same, is a lazy-tongs link 3. The same may be fixed by any suitable means and is here shown as being fixed on a rod 4, the same forming a fixed pivot 5 for one pair of the bars of the said lazy-tongs link. The bars at one end of the said link, which I will call the "inner end" thereof, are connected to the leaves of the door by suitable rods 6. The bars at the outer end of the said link are pivotally connected, as at 7, and also connected to the inner end of a lever 8. The fulcrum 9 of the said lever is fixed and the outer end of the said lever in practice projects beyond one side of the trackway 10, on which the tram-cars are operated. As here shown, the lazy-tongs link is disposed below the trackway, and on the cross-ties is disposed a tread-board 11, which covers the said lazy-tongs link and its connections.

On opposite sides of the door, at suitable distances therefrom, are vertical shafts 12, which are mounted in suitable bearings, as at 13. Each of the said shafts has near its lower end at a suitable point a sprocket-wheel 14, and each of said shafts is further provided with a hand-lever 15. The said shafts 12 are disposed on the same side of the trackway 10, and the said hand-levers are within convenient reach of a driver on a tram-car, so that said hand-levers may be grasped and operated by the driver as the car passes the same without the necessity of dismounting. The said sprocket-wheels 14 are connected together by a sprocket-chain 16, which passes around opposite sides of the respective sprocket-wheels, and the said sprocket-chain is connected to the lever 8 by any suitable means, as at 17. From the foregoing it will be understood that when a hand-lever is turned in the direction of the door when approaching the power will be communicated from one of said sprocket-wheels to the other and also to the lever 8, which lever will operate the lazy-tongs link and cause the door to be opened. This movement disposes the hand-lever on the other side of the door at right angles to the track 10, so that after the door has been passed the same may be turned from the door and cause the latter to be closed.

In the modification of my invention shown in Figs. 3 and 4 the lazy-tongs link is disposed overhead. In this form of my invention I also devise means whereby the door is opened and closed automatically by the car as the latter approaches and recedes from the door.

The car A is provided with a tappet 18. The operating-levers 15 project into the path of said tappet, and said levers have a slight pivotal movement on and independently of the shafts 12. Springs 16^a bear on said arms and hold them in position, with their outer ends within the path of said tappet 18. Hence in approaching and receding from the mine-door said tappet of the car engages and operates the said levers, and thereby automatically opens and closes the door. The levers 12 and springs 16^a may be of any suitable

construction. One form thereof is shown in detail in Fig. 5.

Having thus described my invention, I claim—

1. In combination with a hinged door, an operating-lever having a fixed fulcrum, a lazy-tongs link having one pair of its bars fulcrumed at a fixed point, the bars at the ends of said link being respectively connected to said lever and said door, revoluble elements on opposite sides of the door at a distance therefrom, means to simultaneously turn said revoluble elements in reverse directions, and a connection between said revoluble elements and said operating-lever, substantially as described.

2. In combination with a door, a lever having a fixed fulcrum, a lazy-tongs link connecting said lever to the door, revoluble elements on opposite sides of the door at a distance therefrom, a connection between said revoluble elements and said lever, and yieldably-mounted, spring-pressed operating-levers connected to said revoluble elements, to turn the latter, whereby a car having a tappet may successively engage said operating-levers in approaching and receding from said door to automatically open and close the door, substantially as described.

3. In combination with a hinged door, an operating-lever having a fixed fulcrum, a lazy-tongs link having one pair of its bars fulcrumed at a fixed point, the bars at the ends of said link being respectively connected to said lever and said door, wheels mounted on fixed supports at points on opposite sides of the door and at a distance therefrom, said wheels having levers by which they may be turned, and an element connecting said wheels, to simultaneously turn them in opposite directions, said lever 8 being connected to and operated by said connecting element, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

WILLIAM W. BRADLEY.

Witnesses:

O. C. EDWARDS,

W. J. BOLING.