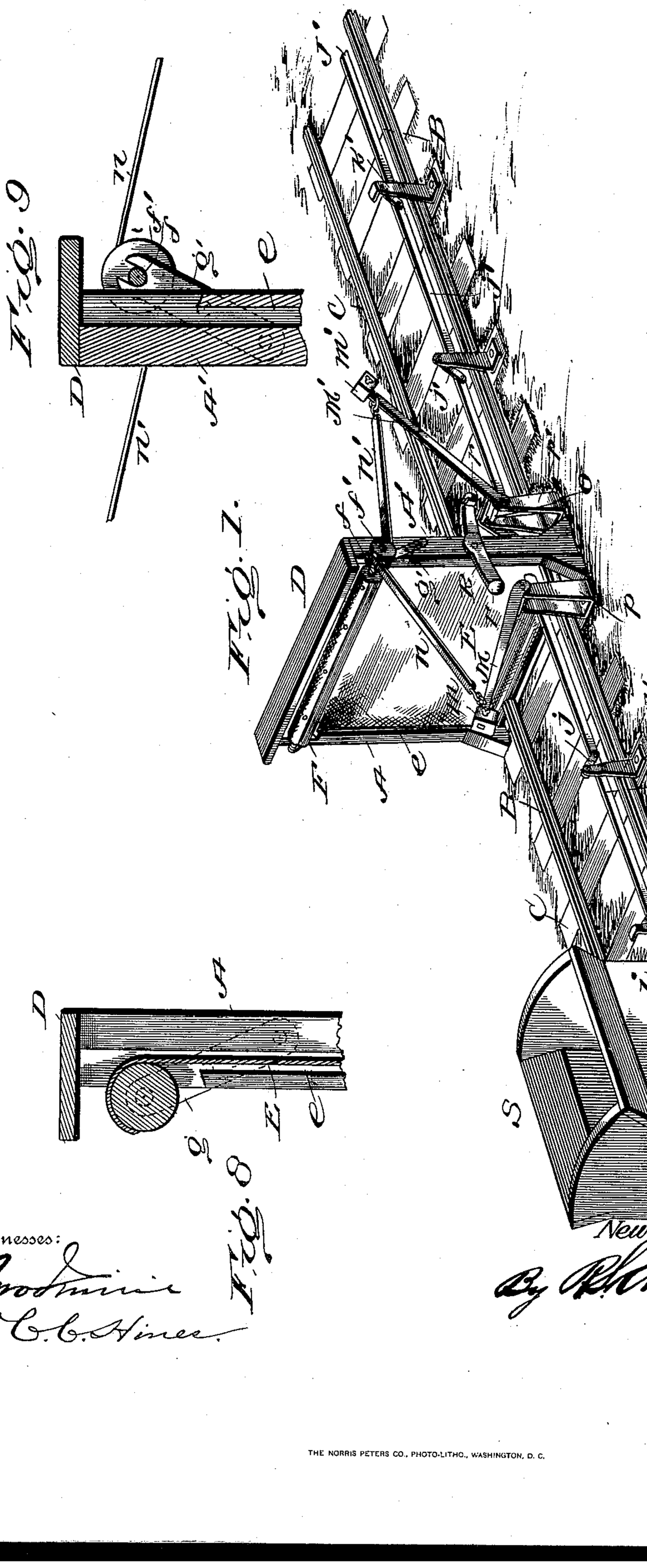
No. 612,012. Patented Oct. 11, 1898.

N. K. BOWMAN.

MINE GATE.

(Application filed Dec. 30, 1897.)

(No Model.) 3 Sheets—Sheet 1.



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3 Sheets—Sheet 2.

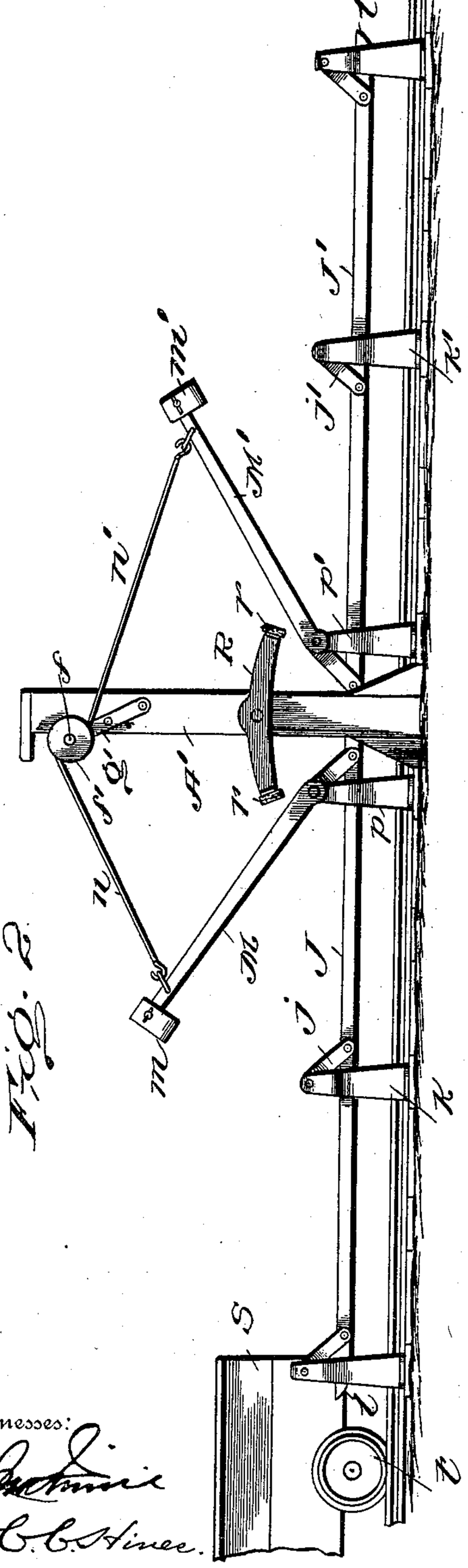

Fig. 2.

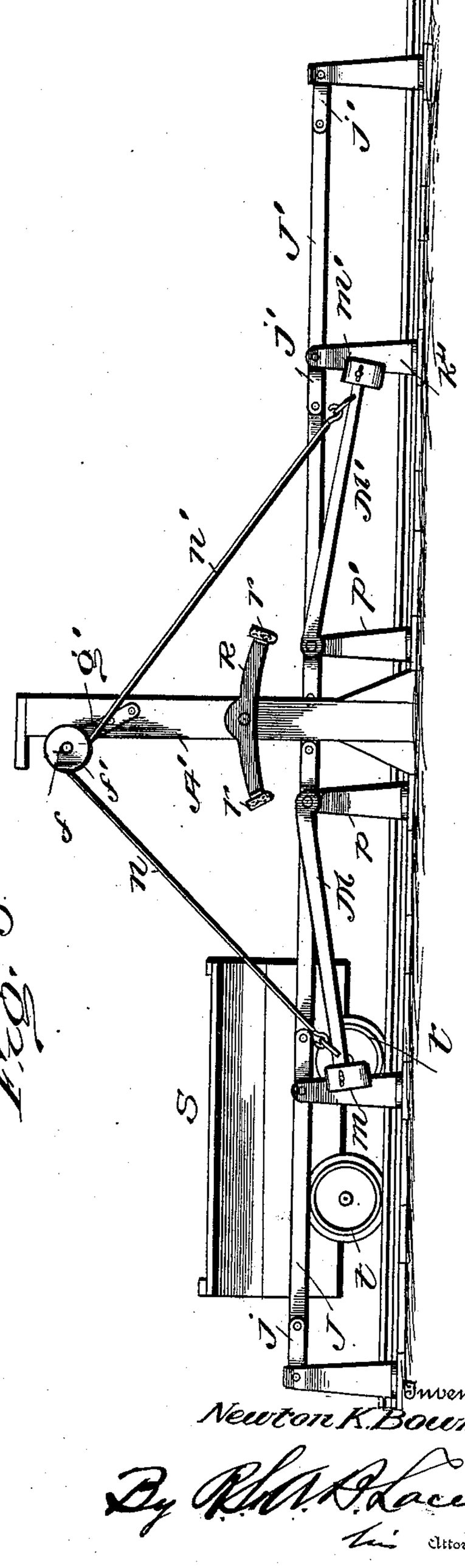

Fig. 3.

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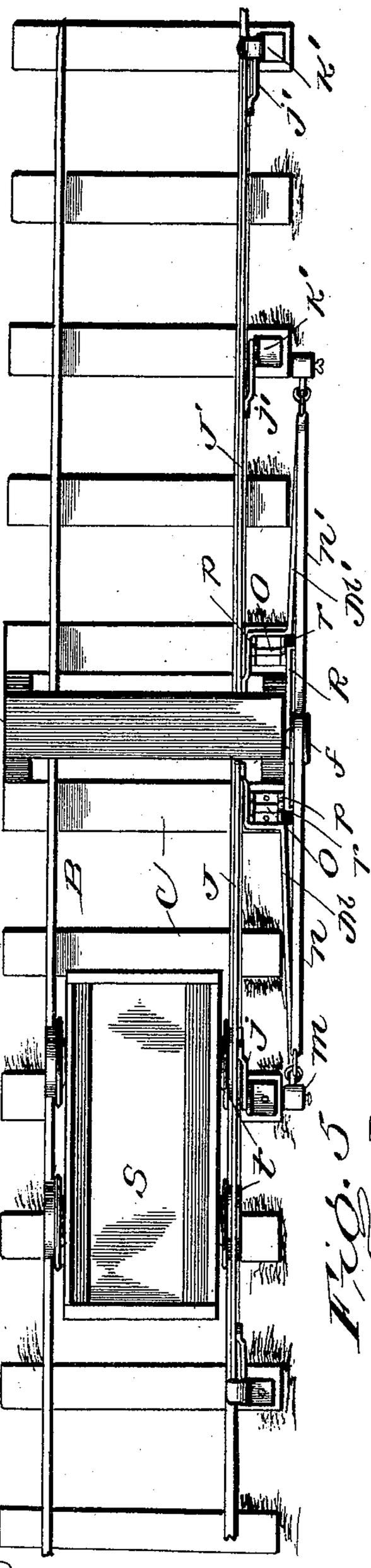

Fig. 4.

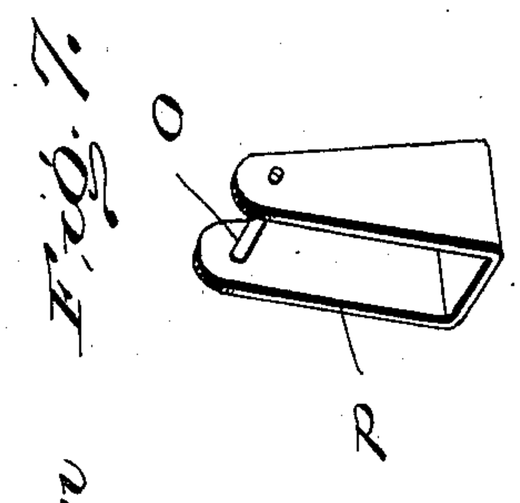

Fig. 7.

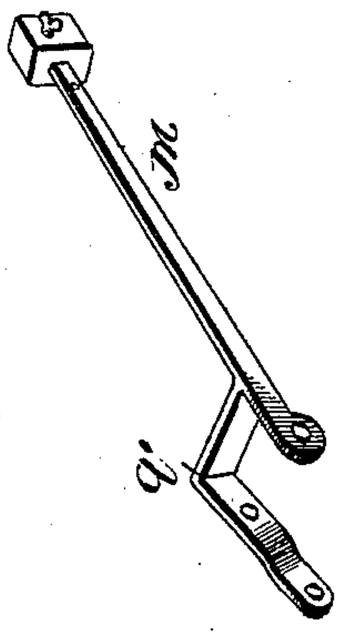

Fig. 6.

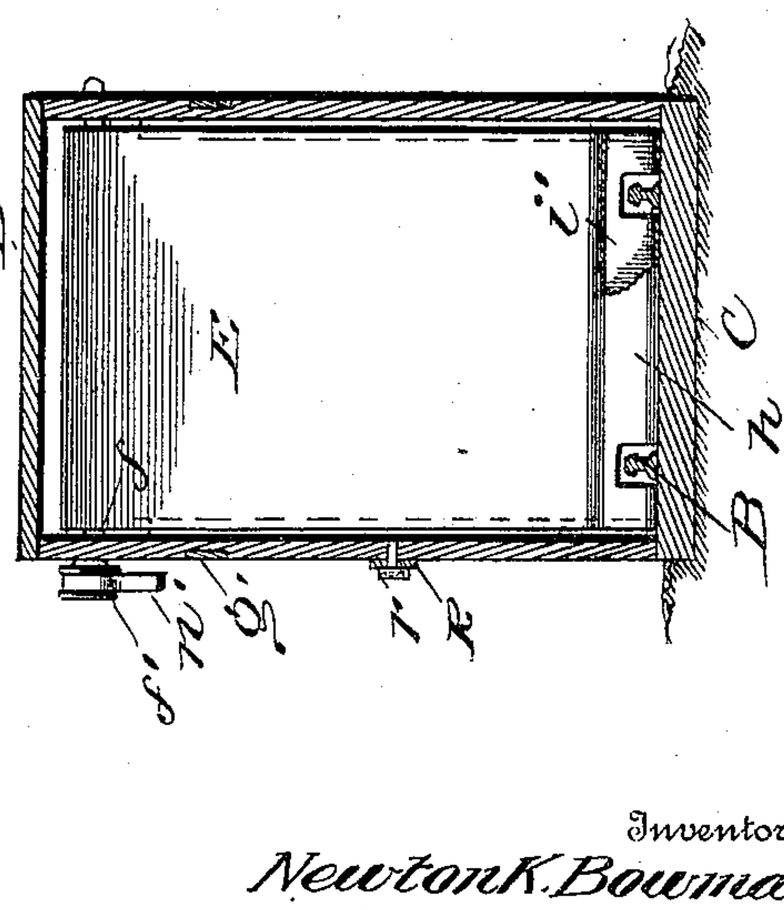

Fig. 5.

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UNITED STATES PATENT OFFICE.

NEWTON K. BOWMAN, OF LAWRENCE, OHIO, ASSIGNOR TO ALVIN HURFORD, OF CANTON, OHIO.

MINE-GATE.

SPECIFICATION forming part of Letters Patent No. 612,012, dated October 11, 1898.

Application filed December 30, 1897. Serial No. 664,531. (No model.)

To all whom it may concern:

Be it known that I, NEWTON K. BOWMAN, a citizen of the United States, residing at North Lawrence, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Mine-Gates; 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.

My invention relates to improvements in mine-gates; and it consists in certain novel features of construction, combination, and arrangement of parts, as will be hereinafter more fully described and claimed.

The primary object of this invention is to provide simple, positive, and effective mechanism adapted to be operated by a car to automatically open the gate and to close the gate by gravity after the car has passed through the gateway.

The detailed objects and advantages of the invention will be pointed out in the course of the subjoined description.

I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of a mine-gate embodying my invention; Fig. 2, an end elevation showing the position of the parts of the operating mechanism when the gate is closed. Fig. 3 is a similar view, but shows the position of the parts of the operating mechanism when the gate is open. Fig. 4 is a top plan view of same. Fig. 5 is a cross-section of the gate-posts and an elevation of the gate-curtain. Fig. 6 is a perspective view of one of the operating-levers; Fig. 7, a detached perspective view of the lever-bearing bracket, and Figs. 8 and 9 are broken detail sectional views of the gate-posts.

A A′ represent the gate-posts, which are arranged on opposite sides of track-rails B B′, laid upon the cross-ties C, and D represents a cross-bar uniting said posts at their upper ends. The said posts are formed on their inner faces with vertical grooves *e*, which receive the side edges of a gate-curtain E, which is made fast at its upper end to a roller F, mounted on a shaft *f*, to rotate in bearing-brackets *g g′*, fixed to said gate-posts. The said shaft *f* carries at one end a fixed pulley *f′*. The curtain is provided at its lower end with a sleeve or pocket *h* for the reception of a counterbalancing-bar *i*, which serves the double function of stiffening the curtain against wind-pressure and closing the gate by gravity in the manner hereinafter described. The said sleeve and bar may be notched or recessed, as shown, to fit down closely over the track-rails.

J J′ represent operating-bars arranged on opposite sides of the gate and pivoted to swing in a vertical plane upon links *j j′*, which are in turn pivoted to standards or bearing-brackets *k k′*, secured to the projecting ends of the cross-ties alongside one of the track-rails, the said bars being located above and in line with said rail B′ and beveled at their outer ends *l l′*, as shown.

M M′ represent operating-levers, provided at their upper ends with detachable weights *m m′* and connected with the fixed pulley *f′* on the roller-shaft *f* by straps or belts *n n′*, wound on said pulley, although chains or cords may be used instead of these straps or belts, if desired. The levers are pivoted at their lower ends to the outer projecting ends of shafts *o*, journaled in the arms of U-shaped bearing-brackets *p p′*, arranged alongside the rail B′ at opposite sides of the gate-post A′, and are provided adjacent to their lower ends with inwardly-projecting L-shaped arms *q q′*, which are pivoted, respectively, to the inner projecting ends of the operating-rods J J′.

The construction and operation of the parts thus far described are such that when the gate is closed the operating-levers extend at an angle of about forty-five degrees relatively to the gate-posts and the operating-bars on a horizontal line about centrally of the length of the standards *k k′*, as shown in Fig. 2; but when the gate is open the levers assume a nearly horizontal position and the bars lie on a horizontal line approximately level with the upper ends of said standards, as shown in Fig. 3. A stop-bar R, secured to the gate-post A′, is provided at each end with a buffer-block *r*, which limits the uptilting movement of the levers.

The operation is as follows: When a car S, running on the rails B B′, nears the gate, the

wheels *t* thereof coming in contact with one of the operating-bars—the bar J, for example—swings said bar upwardly and inwardly and the lever M downwardly. The parts in thus moving draw on the straps *n n'*, which unwind from and rotate the roller F, causing the curtain to wind upon the same and open the gateway. In this operation it will be understood that the lever M is positively moved, while the lever M' tilts down by gravity and swings the bar J' upwardly and inwardly in line with the bar J, and that the reverse action occurs when the bar J' and lever M' are first actuated. The parts are maintained in this position when the car passes through the gateway by the wheels bearing against the bar J'; but when the said bar is released by passage of the car beyond the same the curtain closes by its own gravity and restores the parts to their normal positions. The beveled ends *l l'* of the bars J J' facilitate the mounting of the same upon the car-wheels.

From the above description, taken in connection with the accompanying drawings, the construction and operation of my improved automatic mine-gate will be readily understood, and it will be seen that simple, positive, and effective operating mechanism for opening and closing the gate is provided.

I desire it understood that changes in the form, proportion, and minor details of construction may be made within the scope of the invention without departing from the spirit or sacrificing any of the advantages thereof.

Having thus fully described my invention, what I claim as new and useful, and desire to secure by Letters Patent, is—

1. In a mine-gate, the combination with the track-rails, gate-posts, and a gate mounted thereon to close by gravity, of pivoted operating-levers constructed and adapted to open the gate, and operating-bars pivoted to said levers, said bars being positioned above one of said rails and adapted to be swung upward and inward by the wheels of a car passing over the rails, whereby the bars mount the wheels, substantially as described.

2. In a mine-gate, the combination with the track-rails, gate-posts, and a gravity-closing gate, of fixed standards arranged alongside one of said rails, operating-bars pivoted by links to said standards and adapted to mount upon and be swung inward and upward by the wheels of a car passing over the rails, a pair of tilting operating-levers pivoted at their lower ends to said bars, and connections between the upper ends of the levers and the gate to open the same when said levers tilt downwardly, substantially as described.

3. In a mine-gate, the combination with track-rails, gate-posts, and a gravity-closing gate-curtain mounted on a roller carrying a fixed pulley, of a pair of pivoted operating-levers adapted to tilt down in opening the gate, straps or bands wound on said pulley and connected with said levers, standards arranged alongside one of said track-rails, and operating-bars pivoted by links to said standards and at their inner ends to said levers, substantially as described.

4. In a mine-gate, the combination with track-rails, gate-posts, and a gravity-closing gate-curtain mounted on a roller carrying a fixed pulley, of bearing-brackets on opposite sides of one of said gate-posts, standards alongside one of the track-rails in line with said brackets, levers pivoted at their lower ends to the bearing-brackets and weighted at their upper ends, straps or bands connected to said upper ends of the levers and wound upon the pulley, and operating-bars pivoted at their inner ends to the levers and by links to said standards, substantially as described.

5. In a mine-gate, the combination with the gate-posts A A' and the track-rails B B', of a roller F mounted on said posts and carrying a fixed pulley *f'*, a gravity-closing gate-curtain E connected with said roller, standards *k k'* arranged alongside the track-rail B', bearing-brackets *o o'* on opposite sides of the gate-post A A' in line with the standards, operating-levers J J' pivoted to the brackets and provided with depending arms, straps or bands *n n'* connected to the upper ends of said levers and pulley *f'*, and the operating-rods J J' pivoted by the links *j* to said standards and connected at their inner ends to the said depending arms of the levers, substantially as described.

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

NEWTON K. BOWMAN.

Witnesses:

MICHAEL LALLY,

WALLACE DIXON.