

No. 695,858.

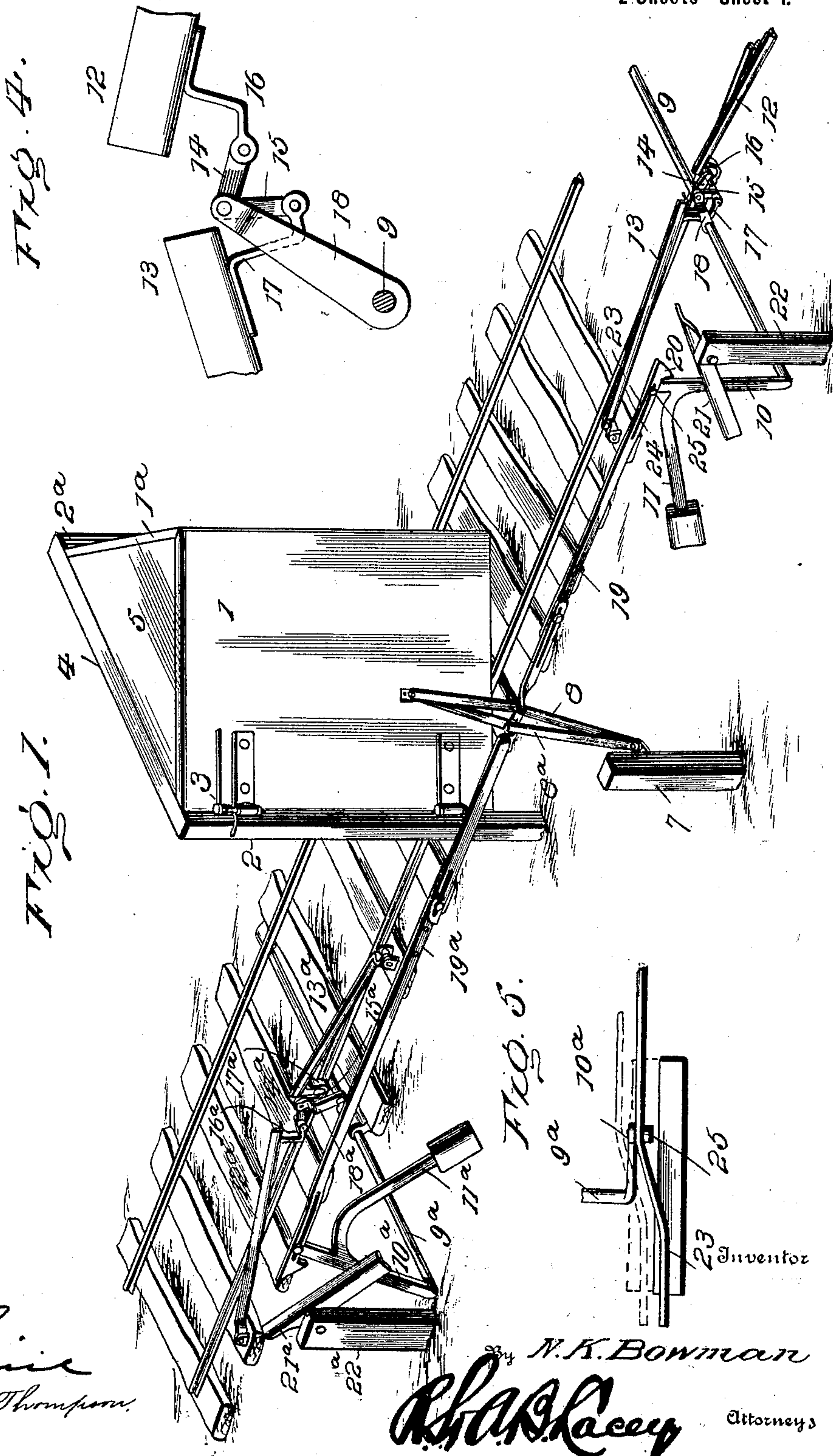
Patented Mar. 18, 1902.

N. K. BOWMAN.
MINE GATE.

(Application filed July 5, 1901.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses

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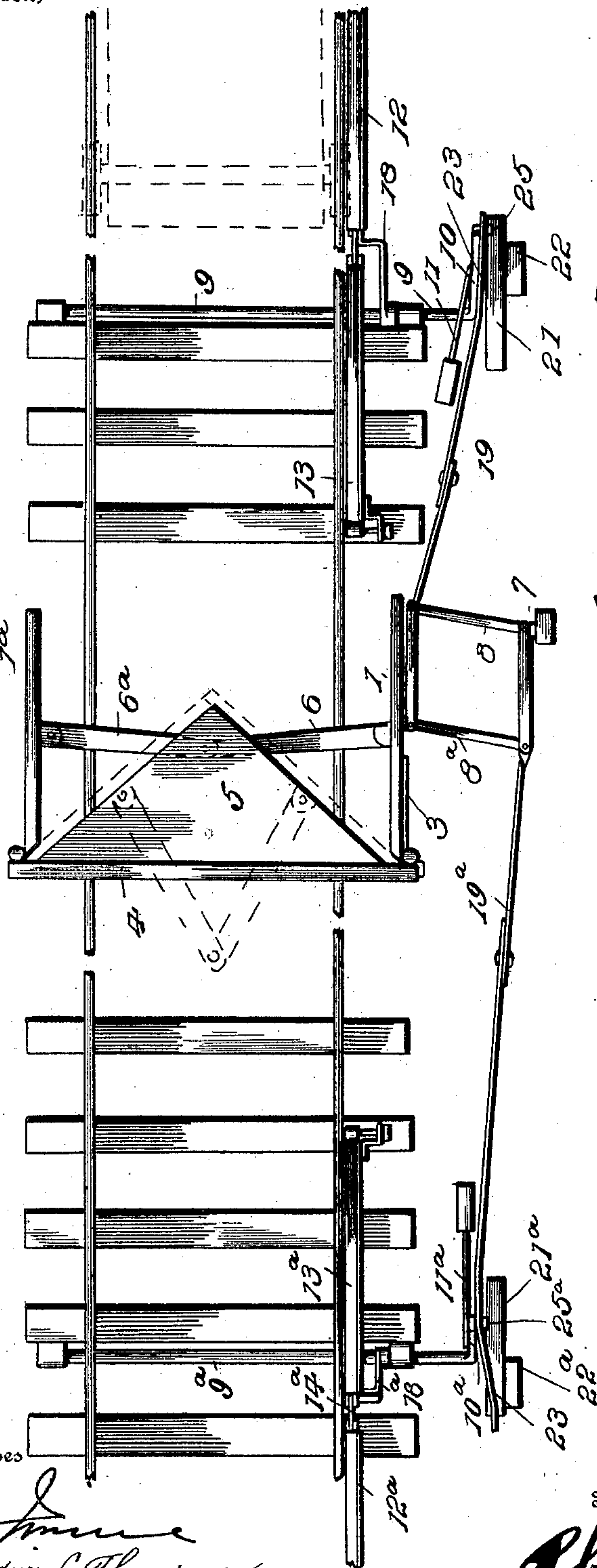
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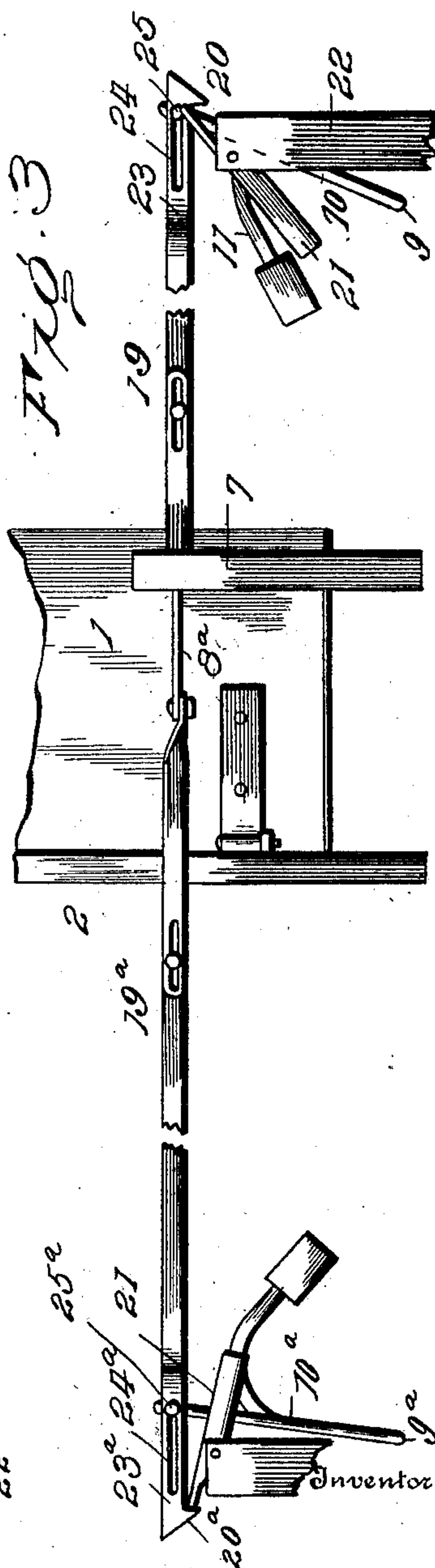
Fig. 2.



Witnesses

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Fig. 3.



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UNITED STATES PATENT OFFICE.

NEWTON K. BOWMAN, OF NORTH LAWRENCE, OHIO.

MINE-GATE.

SPECIFICATION forming part of Letters Patent No. 695,858, dated March 18, 1902.

Application filed July 5, 1901. Serial No. 67,202. (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 ap-
10 pertains to make and use the same.

This invention relates to gates for controlling the drafts or air-currents in the leads and various passages of mines which are automatic in operation, being opened upon the
15 approach of a car and tripped as the car recedes after having passed by the gate.

The gate-actuating means operates in the dual capacity of gate-opener and gate-releaser and is tripped by the car when operating in either capacity.
20

For a full description of the invention and the merits thereof and also to acquire a knowledge of the details of construction of the means for effecting the result reference is to be had
25 to the following description and drawings hereto attached.

While the essential and characteristic features of the invention are necessarily susceptible of modification, still the preferred
30 embodiment of the invention is illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of a mine-gate embodying the essential features of the invention. Fig. 2 is a top plan view thereof.
35 Fig. 3 is a side elevation of the lower portion of a gate and the gate actuating and locking mechanisms. Fig. 4 is a plan view of the gate operating and locking means, the full lines showing the locking mechanism engaged and the dotted lines the position of the
40 parts when released. Fig. 5 is a detail view of the connections between the adjacent ends of cooperating rails and between said ends and the rock-shaft.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.
45

The locking, releasing, and gate-actuating
50 means are adapted to be applied to gates of any form or type, and it is not the intention

to restrict the same to the form or arrangement of gates shown. Duplicate mechanisms are provided upon opposite sides of the gate, and a detailed description of one will suffice
55 for both, corresponding parts being indicated by the same reference-numerals, exponents being applied to the numerals indicating the parts upon one side to distinguish them from like parts upon the opposite side of the gate. 60

The gate for closing the passage comprises the wings 1 and 1^a, hinged at their outer ends to posts 2 and 2^a and automatically closed by a spring 3. The posts 2 and 2^a are connected
65 at their upper ends by a cross-piece 4, from which a triangular-shaped piece 5 projects horizontally and against the inclined edges of which the wings 1 and 1^a of the gate close.

The wings 1 and 1^a are connected for simultaneous operation by means of links 6 and 6^a,
70 which are pivoted at their outer ends to the wings and at their inner ends to each other.

A post 7 is set to one side of the track 8 and is connected to the gate or a wing thereof by means of toggle-levers 8 and 8^a, the extremities of the toggle-levers being connected to
75 each other and to the gate and post by the same pivot-fastenings. Rock-shafts 9 and 9^a are located at a distance from the gate and jour-
80 naled transversely of the track and have arms 10 and 10^a at one end. Weighted arms 11 and 11^a project from the respective arms 10 and 10^a

and serve to hold the rock-shafts in a normal position and to return the depressible bars 12 and 13 and 12^a and 13^a to a normal position.
85 The bars 12 and 13 and 12^a and 13^a are pivoted at their outer ends to ties of the track and incline upwardly toward their inner ends, which are loosely connected by links 14 and 15 and 14^a and 15^a, the link 14 being connected to a
90 bracket 16 upon the inner end of the bar 12 and the link 15 being attached to a bracket 17 at the inner end of the bar 13. The links 14^a and 15^a are similarly connected to brackets 16^a and 17^a and to the adjacent ends of
95 the bars 12^a and 13^a. An arm 18 projects from the rock-shaft 9 and is pivoted to the links 14 and 15 by the same fastening employed for their connection. An arm 18^a projects from the rock-shaft 9^a and is similarly
100 connected with the links 14^a and 15^a. An adjustable bar 19 is connected with the tog-

gle-levers 8 by the same means employed for pivotally connecting the elements, and the opposite end of the bar 19 is provided with a hook 20 to be engaged by a weighted dog 21, 5 pivoted between its ends to a post 22 in proximal relation to the arm 10 of the rock-shaft. A dog 21^a is pivoted in a like manner to a post 22^a and is adapted to cooperate with a hook 20^a at the outer end of an adjustable 10 bar 19^a, connected with the toggle-levers 8^a. The outer end portion of the bars 19 and 19^a is deflected, as shown at 23 and 23^a, and this deflected portion is slotted, as shown at 24 and 24^a, for the reception of a headed fasten- 15 ing or stud 25 and 25^a, projecting laterally from the arms 10 and 10^a.

The bars 12 and 13 and 12^a and 13^a are arranged adjacent to a rail of the track, so as to be depressed by a wheel or other parts of 20 the car and produce a rocking movement of the shafts 9 and 9^a, whereby the gate is either opened and locked or released, according as the car is approaching or receding from the gate. When the gate is closed, as shown in 25 Fig. 1 or by the dotted lines in Fig. 2, and a car approaches from the right, as indicated by the dotted lines in Fig. 2, and reaches a position upon the track to depress the bars 12 and 13, the rock-shaft is oscillated to throw 30 the arm 10 to the right and move the bar 19 therewith, and this movement breaks the toggle-levers to the right and causes an opening of the gate. The toggle-levers 8^a are simultaneously broken to the left, and the bar 19^a is 35 similarly moved to the left a distance to cause its hooked end 20^a to engage with the upper end of the pivoted dog 21^a and hold the gate open. As the car passes by the gate and recedes therefrom it will come in contact with 40 and depress the bars 12^a and 13^a and rock the shaft 9^a to the left, and the arm 10^a, moving in a like direction at its outer end, will cause the headed fastening 25^a to move in the slot 24^a along the deflected portion 23^a, whereby 45 the hook 20^a is drawn inward and disengaged from the dog 21^a, and as the bars 12^a and 13^a are released from the car both they and the rock-shaft 9^a will assume a normal position from the fall of the weight applied to the arm 50 11^a and permit the gate to close through the action of its spring. When the car approaches the gate from the left, the bars 12^a and 13^a will be depressed and the gate opened, and the hook 20 will engage with the dog 21^a 55 to hold the gate until the car has passed thereby and comes in contact with the bars 12 and 13, when the hook 20 will be disengaged from the dog 21 in a manner similar to the disengagement of the hook 20^a from the dog 21^a, 60 previously described, thereby releasing the gate and permitting it to close in the manner stated.

Having thus described the invention, what is claimed as new is—

65 1. In combination with a gate, a lock therefor upon each side, a trip at each side of the gate a distance therefrom, and connecting

means between the trips and the gate, including bars mounted for longitudinal movement in opposite directions, the parts being com- 70 bined, whereby the actuation of a trip upon one side of the gate by the approach of a car effects an opening of the gate and sets the lock upon the opposite or far side of the gate to hold the latter open and whereby operation 75 of the remote trip effects a release of the lock and permits the gate to close, substantially as set forth.

2. In combination with a gate, trip mechanisms therefor at each side for actuation by a 80 car when approaching and receding from the gate, a lock at each side of the gate, connections between the gate and trips adapted to cooperate with the respective locking devices, and including oppositely-movable bars and 85 pairs of toggle-levers arranged to break joint in opposite directions, the lock upon the remote side of the gate being set by a car approaching the gate and actuating the trip upon the inner side and the said lock being re- 90 leased by actuation of the trip upon the remote side of the gate as a car recedes therefrom, substantially as set forth.

3. In combination with a gate and trips at opposite sides thereof, a locking device at each 95 side of the gate, bars extending in opposite directions from the gate and having loose connection with elements of the respective trips and adapted to be engaged by the said locking devices, and means for releasing the bars 100 from the locking devices to permit the gate to close, substantially as set forth.

4. In combination with a gate and a trip mechanism at each side thereof, a locking device at each side of the gate, bars having con- 105 nection with the gate and extending therefrom in opposite directions and adapted to interlock with the said locking devices, and a movable part connected with each of the trip devices and having loose connection with the 110 outer end portion of the respective bars to effect a release of the gate-locking means, substantially as set forth.

5. In combination with a gate, and trip devices at each side thereof, toggle-levers con- 115 necting the gate with a fixed part at one side thereof, bars having connection at their inner ends with the toggle-levers and having their outer end portions longitudinally slotted, and arms connected with the respective 120 trip devices and having loose connection with the outer ends of the said bars, substantially as set forth.

6. In combination with a gate, and trip devices at each side thereof, bars having con- 125 nection with the gate and extended in opposite directions therefrom, a locking device at each side of the gate for cooperation with the respective bars, and a connection between corresponding trip devices and bars for ef- 130 fecting an opening, a locking, and a release of the gate, substantially as set forth.

7. In combination with a gate and a trip mechanism at each side thereof, a locking de-

vice at each side of the gate, bars extended in opposite directions from the gate and connected therewith and adapted for coöperation with the lock devices for holding the gate open, and connecting means between the respective trip devices and bars having a loose connection with the latter, whereby actuation of the trip device upon one side of the gate will set the lock upon the opposite side and actuation of the trip upon the latter side will release the lock and permit automatic closure of the gate, substantially as specified.

8. In combination with a gate and a trip device, a locking device, a bar having connection with the gate and adapted to interlock with the locking device to hold the gate open and provided with a deflected portion, and a connection between the trip device and bar having loose connection with the latter and adapted to exert lateral pressure upon the deflected part of the bar to effect disengagement thereof from the locking device, substantially as set forth.

9. In combination, a gate, a trip device, a rock-shaft having an offstanding arm, a lock device, a bar having connection with the gate and provided with a deflected portion and a part to interlock with the said locking device, and connecting means between the deflected part of the bar and the aforesaid arm of the rock-shaft, whereby disengage-

ment of the bar from the locking device is effected, substantially as set forth.

10. In combination with a gate, and a trip device at each side thereof, a rock-shaft for each trip device having an offstanding arm, a locking device, toggle-levers connecting the gate with a fixed part, oppositely-extended bars connected with the respective toggle-levers and having their outer end portions deflected and hooked for coöperation with the locking devices, and connecting means between the arms of the rock-shafts and the deflected portions of the respective bars, substantially as and for the purpose set forth.

11. In a mine-gate, oppositely-inclined wings adapted to open in opposite directions, links connecting the wings for simultaneous action, trip devices at each side of the gate, oppositely-extended bars connected with one of the wings of the gate, locking devices for the outer ends thereof, and connecting means between the outer ends of the bars and the trip devices adapted to effect a release of the said bars from the coöperating locking devices, substantially as set forth.

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

NEWTON K. BOWMAN. [L. S.]

Witnesses:

R. A. POLLOCK,
JOHN POLLOCK.