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W. H. GRONINGER & J. F. JACOBS.

RAILROAD GATE.

No. 344,371. Patented June 29, 1886.

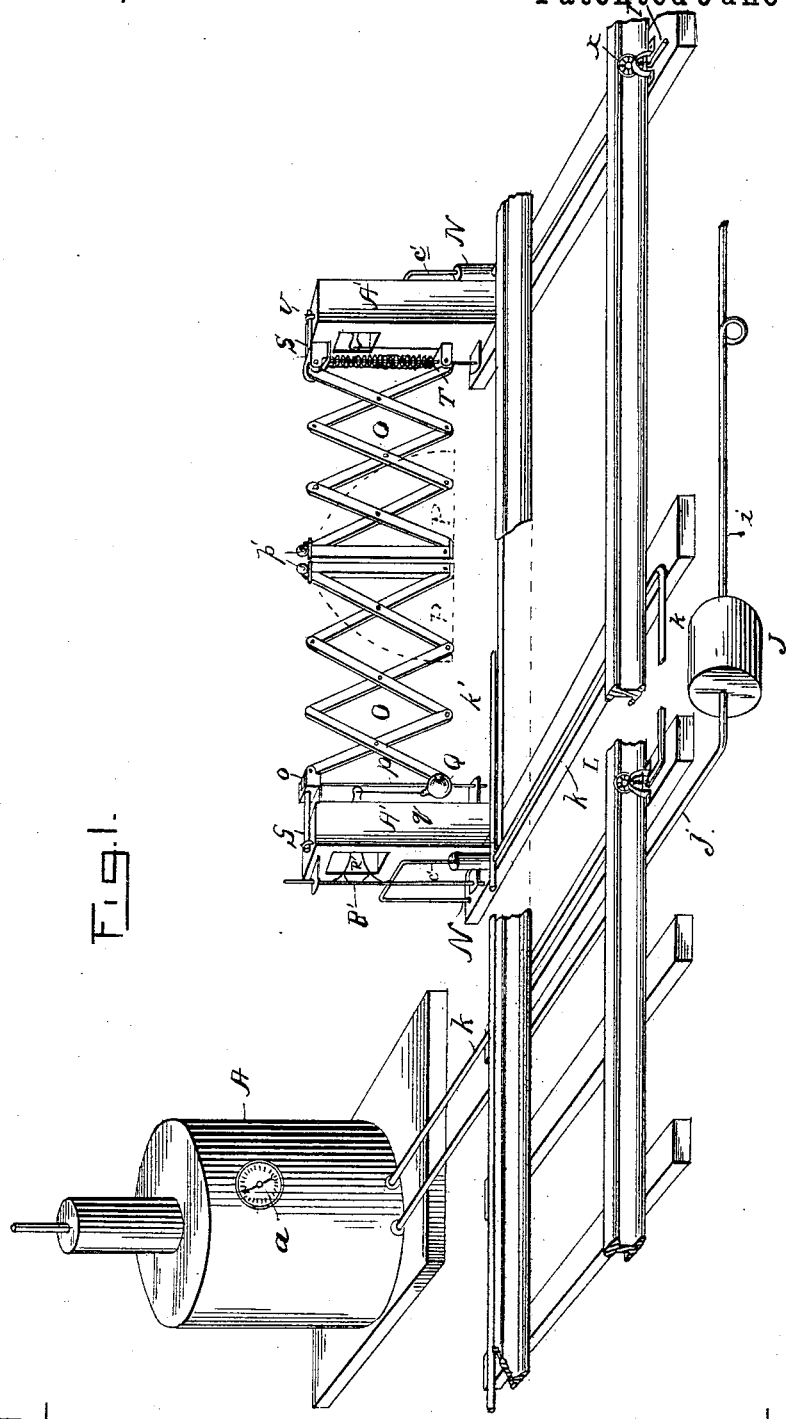

Fig. 1.

WITNESSES:
Norris A. Clark
R. W. Bishop.

INVENTORS,
Wm. H. Groninger
John F. Jacobs
by R. H. & A. P. Lacey attys

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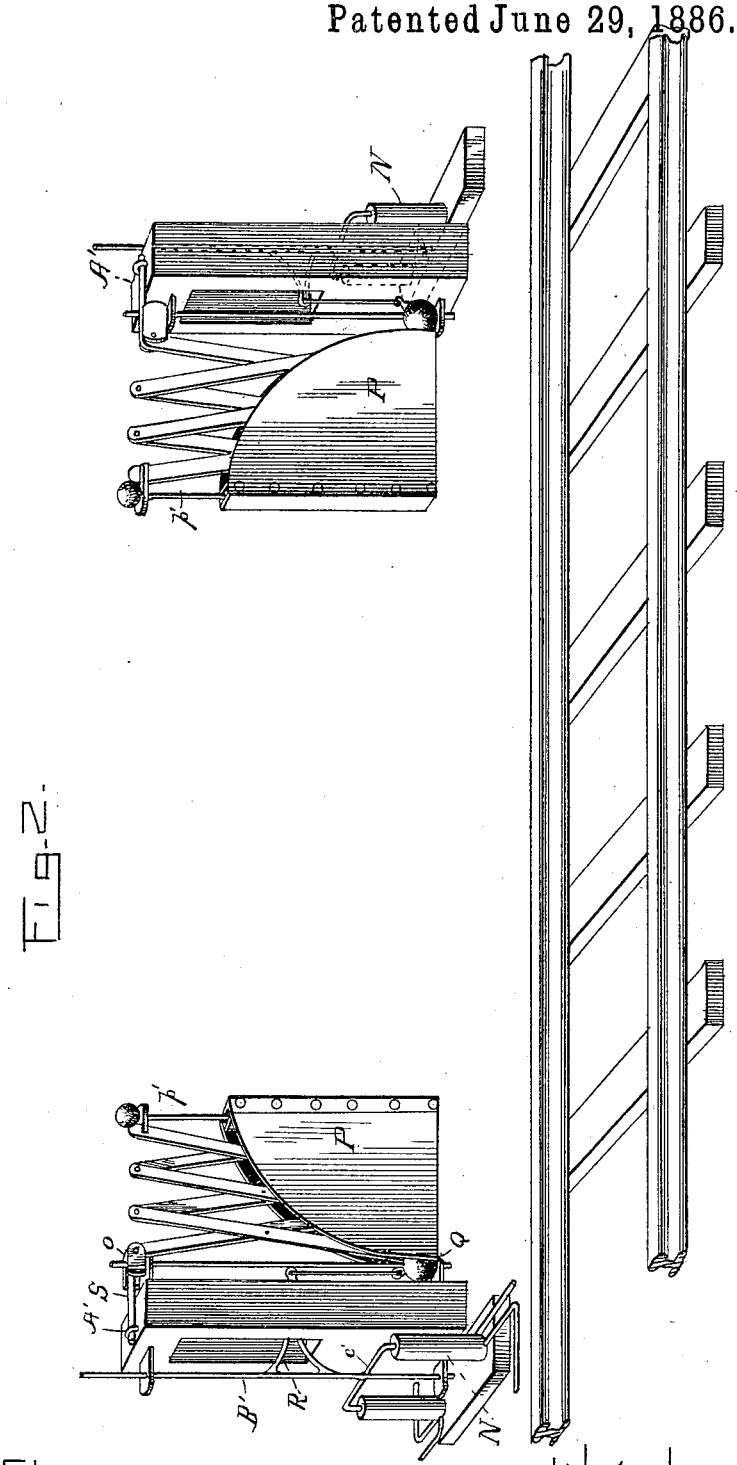

Fig. 2.

WITNESSES:
Norris A. Clark.
R. N. Bishop

INVENTORS.
Wm. H. Groninger
John F. Jacobs
by R. S. & A. P. Lacey attys

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W. H. GRONINGER & J. F. JACOBS.

RAILROAD GATE.

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Fig. 2.

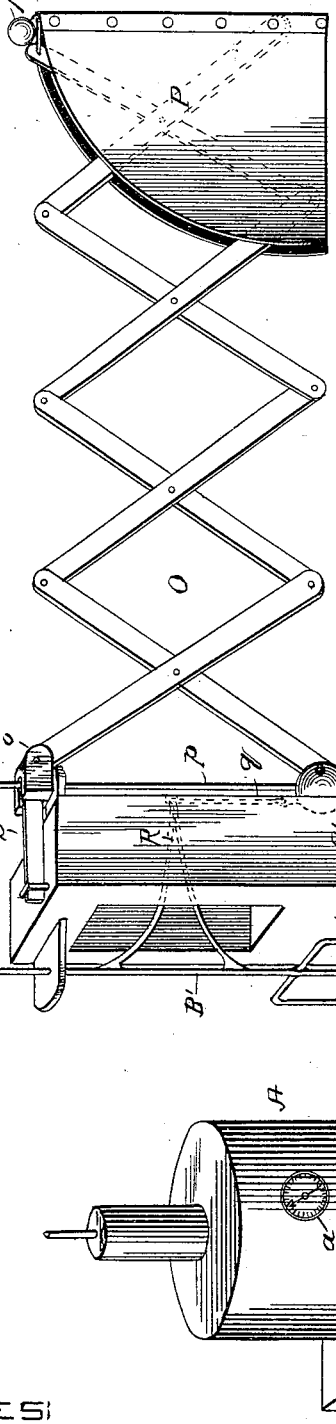
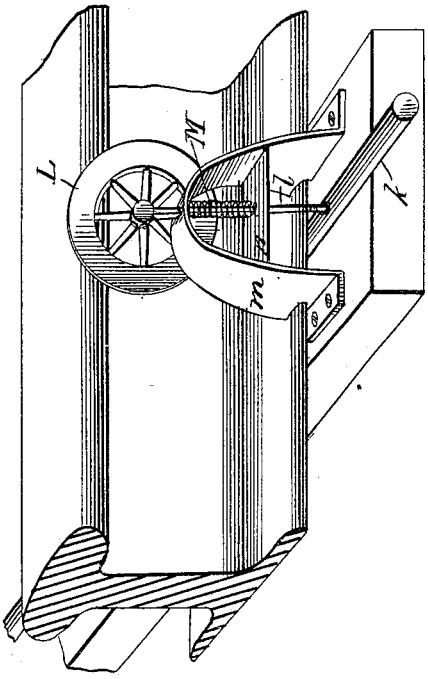
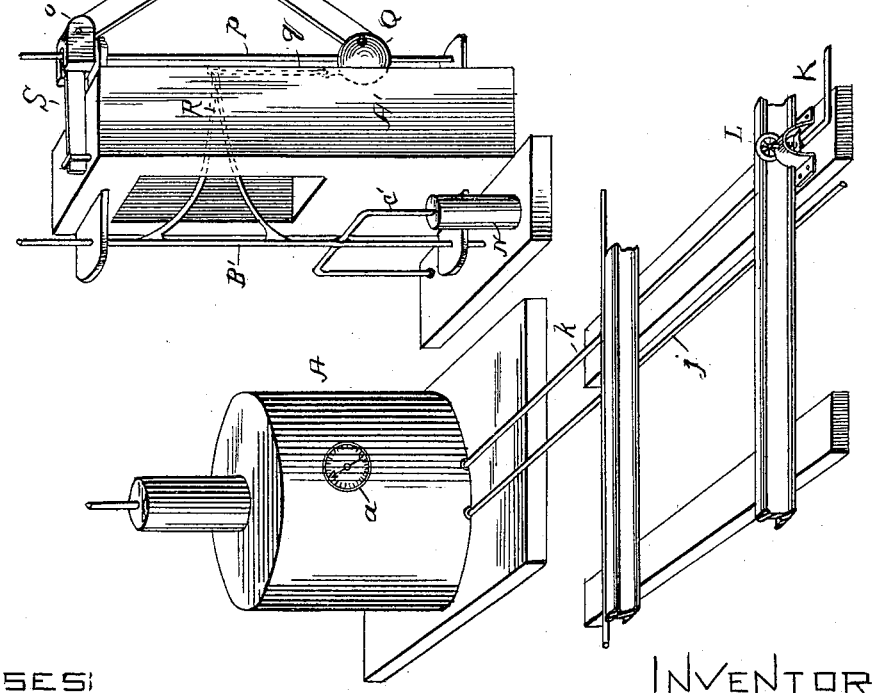


Fig. 4.





WITNESSES:
Norris A. Clark.
R. N. Bishop.

INVENTORS.
Wm. H. Groninger.
John F. Jacobs
R. S. & A. L. Lacey Attys

(No Model.) 4 Sheets—Sheet 4.

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RAILROAD GATE.

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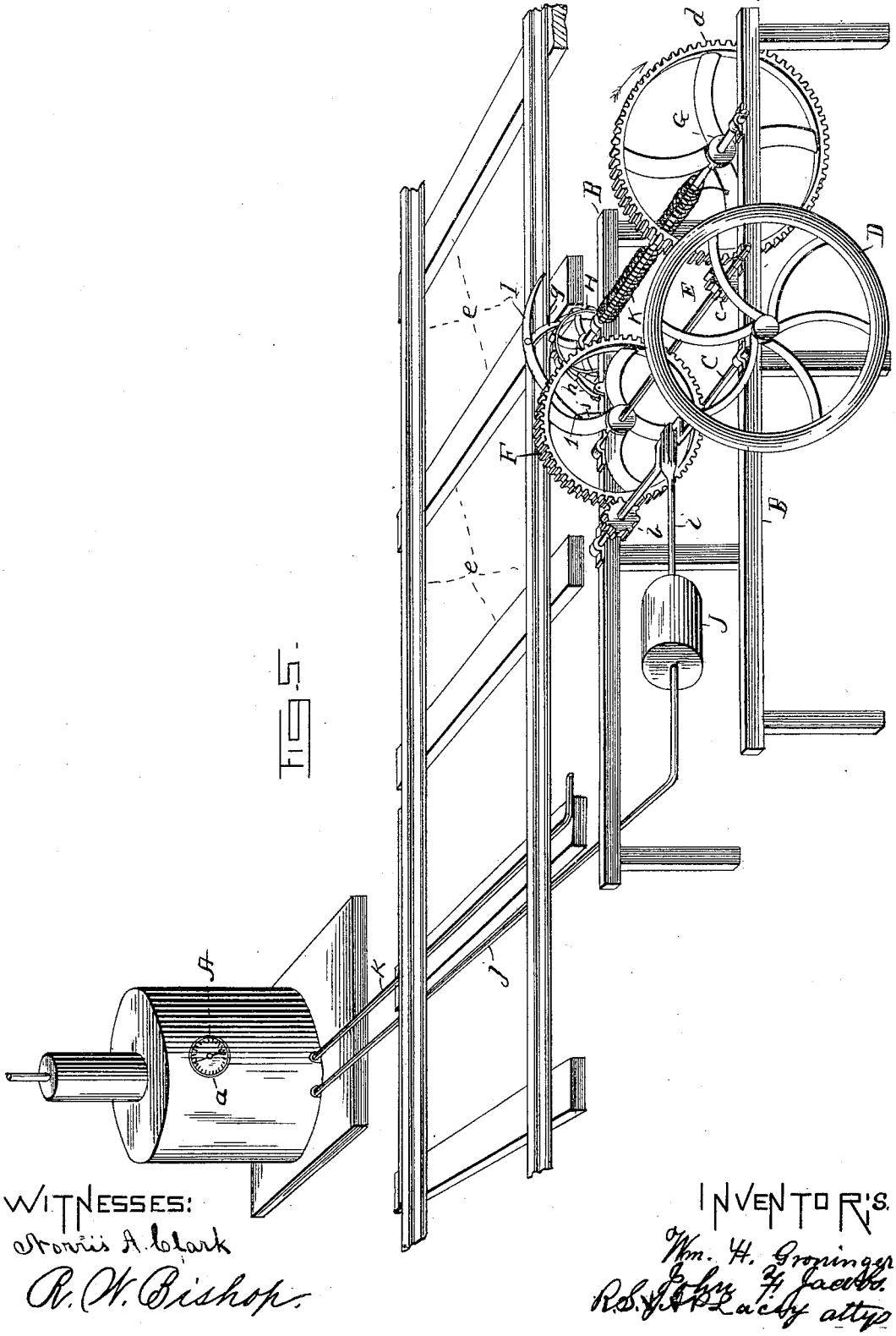

FIG. 5.

WITNESSES:
Morris A. Clark
R. W. Bishop.

INVENTORS.
Wm. H. Groninger
John F. Jacobs.
R. S. Lacey & Co. attys

UNITED STATES PATENT OFFICE.

WILLIAM H. GRONINGER AND JOHN F. JACOBS, OF PORT ROYAL, PA.

RAILROAD-GATE.

SPECIFICATION forming part of Letters Patent No. 344,371, dated June 29, 1886.

Application filed August 13, 1885. Serial No. 174,301. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM H. GRONINGER and JOHN F. JACOBS, citizens of the United States, residing at Port Royal, in the county of Juniata and State of Pennsylvania, have invented certain new and useful Improvements in Railroad-Gates; and we 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 letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to automatic gates for railroad-crossings, and has for its object to simplify and cheapen the construction, and render more positive and efficient in operation the devices by which such gates are worked; and to these ends and to such others as the invention may promote it consists in the peculiar combination and the novel construction and arrangement of parts, as hereinafter more fully described, and specifically defined by the claims.

In the accompanying drawings, which form a part of this specification, Figure 1 represents a section of a railroad and crossing provided with my improvements. Fig. 2 is a perspective view of a section of track, showing the gates opened. Fig. 3 is a perspective detail showing one of the gates extended. Fig. 4 is a detail showing the mechanism for operating the valve. Fig. 5 is a perspective view illustrating the preferred way of keeping the cylinder supplied with compressed air.

While our invention, with slight changes, may be applicable to danger-signals, block-signals, and station-alarms, as well as to gates, for the sake of convenience we have shown it in the drawings as applied to gates only, and shall so refer to it in the following description; and while the motive power may be steam, water, or other suitable equivalent, we prefer compressed air, and shall confine our description to it; but we wish it distinctly understood that in the following claims we do not intend to limit ourselves to compressed air.

Referring to the drawings, the letter A designates a suitable tank or reservoir arranged the necessary distance, say, an eighth of a mile from a railroad-crossing, and provided with the air-gage *a*. This tank is supplied with compressed air in the following manner: Along one side of the track is placed a suitable frame, B. C is a crank-shaft journaled in said frame, and carrying at one end a fly-wheel, D, and near the other a cog-wheel, *b*. E is another shaft journaled in said frame, and carrying at one end a cog-wheel, F, meshing with the wheel *b*, and at the other end a small cog-wheel, *c*, similar to the wheel *b*. Still another shaft, G, is journaled in the frame, and carries at one end a cog-wheel, *d*, meshing with the wheel *c* on the shaft E. This latter shaft G is extended past the frame on the side adjacent to the track *e*, as shown, and on that end is secured a ratchet-wheel, H. I is a lever pivoted at 1 to a block, *f*, secured to the side rail of the frame B, and *g* is a pivoted pawl carried by said lever, and adapted to engage said ratchet-wheel, for the purpose hereinafter described. *h* is a pawl pivoted to the frame B, and engaging the ratchet-wheel to prevent back motion thereof. J is a pump-barrel, and *i* is the piston-rod, to which the piston (not shown) is attached. The opposite end of this rod is secured to the crank-shaft C, and has a reciprocating motion imparted thereto from said shaft.

Normally, the lever I is elevated, and is in the path of the wheel of a passing train. This lever is moved by the passing wheels, and the pawl *g* acts on the ratchet-wheel and rotates it, together with its shaft, in the direction of the arrow. To overcome the inertia and allow time for the wheels *d*, *c*, F, and *b* to move without injury to any of them, owing to the sudden rotation of the shaft G, I loosely mount the wheel *d* on its shaft, and connect with said wheel one end of a spiral spring, K, which encircles the shaft and has its opposite end fastened thereto near the ratchet-wheel; or the wheel *d* may be made fast to the shaft and the ratchet-wheel left loose thereon, in which case one end of the spring should be made fast to the ratchet-wheel instead of the wheel *d*. A pipe, *j*, leading from the pump to the reservoir, provides for the conveyance of the compressed air to said reservoir.

Instead of the mechanism just described,

the reservoir may be supplied by any known means—as, for instance, by a hand wind-pump, steam, water, or any suitable power.

The devices for operating the gates are as follows: *k* is a pipe leading from the reservoir and passing under the rails, as shown. L is a roller arranged to be operated by the wheels of a passing train. *l* is a rod secured to said roller, and passing loosely through the bracket *m* and brace-plate *n*. The lower end of this rod carries a valve (not shown, as any well-known form of check-valve may be used) arranged inside the supply-pipe *k*. M is a spiral spring surrounding said rod between the plate *n* and the top of the bracket, which normally keeps the roller in the position shown in Fig. 4. From this point the pipe *k* passes across the track at suitable distance therefrom, and then connects with the cylinder N. A′ are the gate-posts. B′ are rods passing vertically through arms extending from the top and bottom of each of said posts. C′ is a piston-rod carried by said rod B′, and operating a piston (not shown) within the cylinder N. O is a gate formed of slats pivotally connected together lazy-tongs fashion. The upper inner end of the gate is pivotally connected to a block, *o*, supported by a rod, *p*, while the lower end is pivoted to a weight, Q, loosely sleeved on said rod, and free to slide thereon. P is a shield protecting the outer end of the gate, and preventing the same from injury when extended, and also serving to protect the gate when not extended, as will be readily understood. R is a rod extending from the rod B′, through a slot in the gate-post, and its free end connected to the weight Q by a chain or cord, *q*. S is a spring-bar connected to the block *o*, and passed loosely through a keeper on the top of the gate-post. The object of this spring is to allow the gate to yield in case it should close on a vehicle, and be drawn away thereby. As soon as the said vehicle is disengaged from the gate the spring draws it back to its normal position—that is, at right angles to the gate-post. The other gate may be operated in the same way, as shown in Fig. 2; or it, or both of them, may be operated by mechanism illustrated at the right of Fig. 1, which is the same as that just described, except that a spring, T, is substituted for the weight Q.

It will be observed that in the operation of the gate, its inner and outer ends relatively approach and recede from each other. The connection of the inner lower end with the vertically-movable weight or block sliding on the rod *p*, permits of such movement of the inner ends of the gates, while the upper outer end is connected to a vertically-sliding rod, *p′*, which moves in and out of the shield, according to the direction and movement of the gate, as will be readily understood.

From the foregoing description the operation will be apparent. The gates are normally in the position shown in Fig. 2. As the train reaches the roller L the wheels depress the same, together with the rod *l*, which opens the valve in the pipe *k*. As soon as this valve is opened the compressed air in the reservoir flows through said pipe into the cylinder N, beneath the piston therein, which at this time is at the bottom of the cylinder. As air enters the cylinder it forces the piston upward. This upward movement of the piston lifts the rod B′, and through the connection with the gate lifts the weight, which, sliding on the rod *p*, forces the gate outward across the roadway, as shown in Fig. 3. A pipe, *k′*, leads to the cylinder of the other gate, so that as the valve in the pipe *k* is opened air flows to the two cylinders simultaneously. Consequently the two gates are extended at the same time into the position shown in Fig. 1. The valve-opener should be placed at about one-eighth of a mile from the crossing, so as to insure the closing of the passage-way before the arrival of the train. The gates remain in the position shown in Fig. 1 until the train reaches the crossing, where there is arranged a valve-opener, X, similar to that before described in connection with the pipe *k*. As the train passes over the opener a valve is opened in the pipe *r*, to allow the air in the cylinder N and the pipes connected therewith to be exhausted, when the weight Q or spring T, whichever the case may be, draws the gate back into its normal position, and thus leaves the street open to travel.

Where double tracks are used, the gate may be arranged between the tracks and two cylinders provided, the piston-rod of each cylinder being connected to and operated by the rod B′, as shown in Fig. 2, it being, of course, understood that the cylinders are both provided with pipes *k k′*, &c.

When used on a single track, the pipes, valve-opener, &c., are arranged on the opposite side of the track also, so that the gates may be operated, no matter in which direction the train is moving, the principle being the same in all cases. To allow for the contraction and expansion of the various pipes, loops are formed therein at stated intervals, as indicated in Fig. 1 at *i′*.

We do not intend to limit ourselves to the exact construction shown and described, as it is evident that the same may be varied to a certain extent without departing from the spirit of our invention. For instance, both the ratchet-wheel H and the cog-wheel *d* may be loose upon the shaft G, and the two connected by the spiral spring, and still accomplish the same result; and other changes of a like nature may be made at the convenience or option of the manufacturer and still retain the main features of our invention.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

1. The combination, with the lazy-tongs gate, of a laterally-yielding support pivotally connected with its inner upper end, of an operating-rod connected with the inner lower end to project the gate across the roadway, and a weight

connected with said lower end of the gate to force it away from the upper end and retract the gate, substantially as and for the purpose set forth.

2. The combination of the lazy-tongs gate pivotally supported at its inner upper end, a rod, a weight loosely mounted thereon and pivotally connected with the inner lower end of the gate, a cylinder, intermediate connections uniting the piston of the cylinder with the inner lower end of the gate, and a rod actuated by the passing train to supply a power medium to the cylinder, substantially as set forth.

3. The combination, with the gate-post, of the support *o*, secured thereto to yield laterally, a gate pivotally connected with the support at its inner upper end, and a spring-bar fixidly connected to the support and passed loosely through a keeper in the post to normally hold the gate in a fixed position and permit it to yield laterally, substantially as and for the purpose set forth.

4. The combination, with the lazy-tongs gate, of a shield pivotally attached to its outer lower end and a vertically-sliding rod connecting the outer upper end of the shield with the outer upper end of the gate, said shield forming a protection for the gate when the latter is folded and for the sliding rod when it is projected, substantially as shown.

5. The combination, with the reservoir A, a cylinder, N, gate O, and gate-operating mechanism, as described, of the pipe *k*, connecting said cylinder and reservoir, and the roller L, carrying rod *l*, adapted to be depressed by the wheels of a passing train to open a valve in said pipe, as set forth.

6. The combination, with the reservoir A, cylinder N, gate O, and gate-operating mechanism, as described, of the pipe *k*, connecting said cylinder and reservoir, the roller L, carrying rod *l*, depressed by the wheels of a passing train to open a valve in said pipe, and the spring M, surrounding said rod, substantially as and for the purposes specified.

In testimony whereof we affix our signatures in presence of two witnesses.

WM. H. GRONINGER.
JOHN F. JACOBS.

Witnesses:
E. BRUCE CRESSMAN,
GEO. S. MCCURDY.