(No Model.) 2 Sheets—Sheet 1.

T. STEBBINS.

RAILROAD CROSSING GATE.

No. 456,914. Patented July 28, 1891.

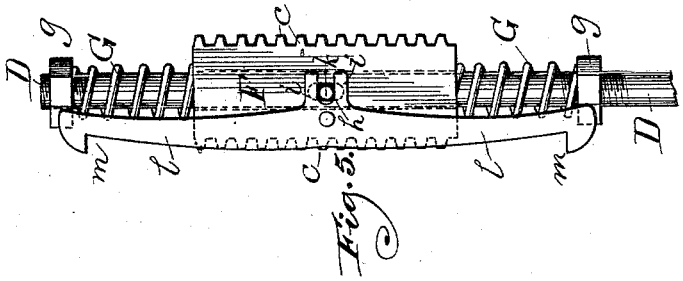

Fig. 5.

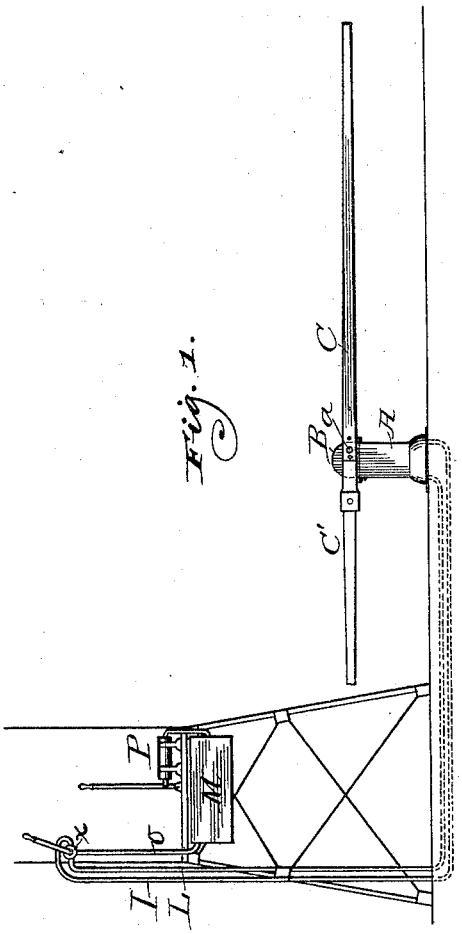

Fig. 1.

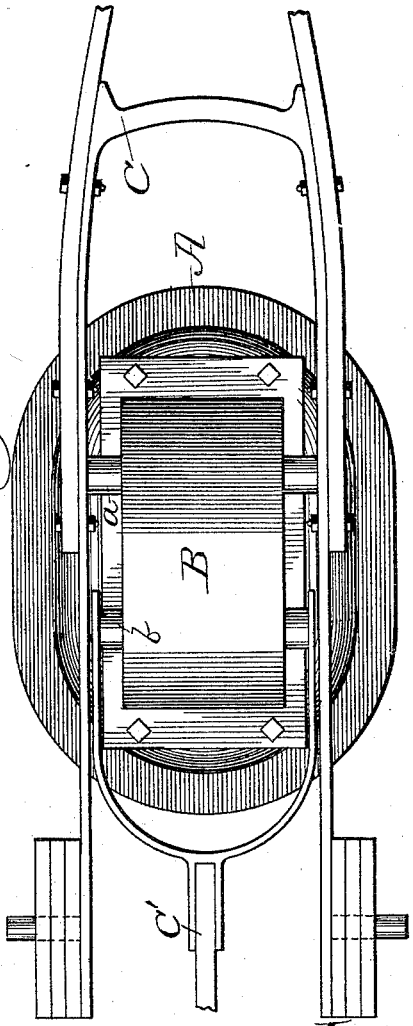

Fig. 4.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

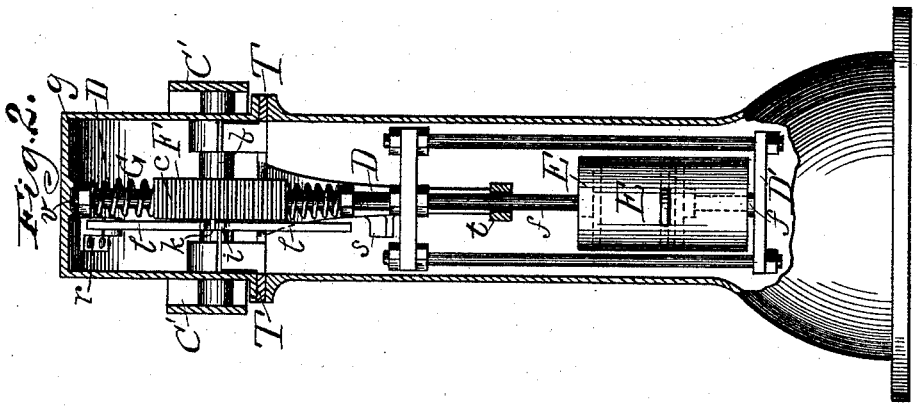
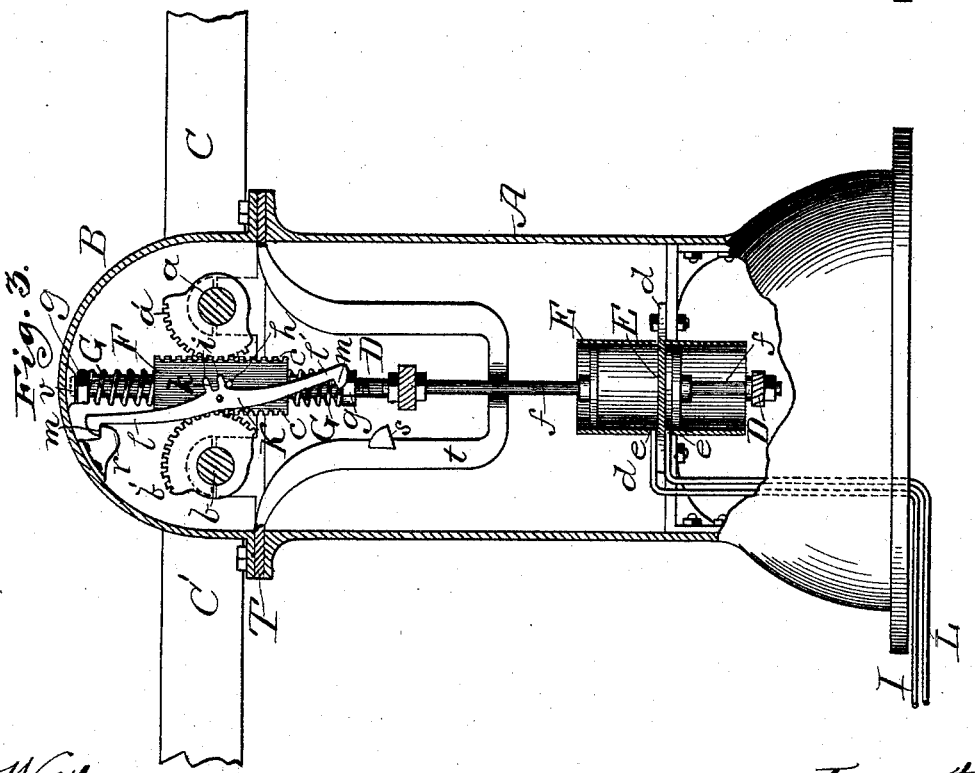


Fig. 3.



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UNITED STATES PATENT OFFICE.

TIMOTHY STEBBINS, OF CHICAGO, ILLINOIS.

RAILROAD-CROSSING GATE.

SPECIFICATION forming part of Letters Patent No. 456,914, dated July 28, 1891.

Application filed March 3, 1891. Serial No. 383,591. (No model.)

To all whom it may concern:

Be it known that I, TIMOTHY STEBBINS, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Gates for Railroad-Crossings, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The object of my invention is to provide a pneumatically-operated railroad-crossing gate which will automatically lock when in its raised or lowered position, so as to be immovable when subjected to outside meddling, and can only be unlocked through the agency of the actuating devices controlled by the gateman, and which is comparatively cheap and simple in construction and operation, substantially as hereinafter fully described, and as illustrated in the drawings, in which—

Figure 1 is a side elevation of my invention. Fig. 2 is a transverse vertical section through the box or case of one of my improved gates. Fig. 3 is a vertical section through the center of the same at right angles to the plane of the section shown in Fig. 2. Fig. 4 is a plan view of my invention, and Fig. 5 is a detail view showing a side elevation of the upper part of the "piston-rod" and the locking mechanism carried thereby.

In the drawings, A represents a casing or box, the exterior of which may be rectangular, cylindrical, or other shape in cross-section. It matters not so far as the purposes of my invention are concerned. The upper open end of this box is covered over by a suitable cover B, in the sides of which are suitable bearings for the transverse shafts *a* and *b*. These shafts *a* are *b* are parallel, and are located, preferably, one on each side of the center and an equal distance therefrom. One of these shafts has attached to one end a gate C, which closes the road, and the other shaft carries on its opposite end a gate C′, that operates over the sidewalk, and each of said shafts has about its center of length a segmental gear *a′* and *b′*, respectively, which gears project toward each other and otherwise correspond to each other in their relative arrangement on their respective shafts. These segmental gears are actuated by a vertically-reciprocating piston-rod D. This may be driven by an ordinary cylinder located in alignment with said piston-rod; but I prefer, for the purpose of obtaining more power, if necessary, and for the purpose of getting just as much power in the one direction as in the other, to provide a cylinder E, which is of a suitable length, and is supported in the center of the box in alignment with the piston-rod by means of lugs *d d*, which project laterally from it and rest upon and are bolted or otherwise secured to appropriate ledges built inward from the inner surface of the box with reference thereto. This cylinder is divided into an upper and a lower chamber by a diaphragm E′, each of which has a suitable inlet and outlet port *e*. In order to enable the piston-rod to be operated by such a cylinder, I connect the lower end of the piston-rod with an open rectangular frame D′ and provide the horizontal parts of said frame with vertical stubs *f f*, which are in vertical alignment with the guide-openings in the outer ends of the upper and lower chambers of the cylinder, and which, entering said chambers, are provided with suitable piston-heads, as shown. I prefer to admit air-pressure through a port located back of the piston-head, which will automatically open when the said piston is making its return movement; but, if desired, I can admit and exhaust the air on both sides of said piston-head.

It is apparent from the construction, as hereinbefore described, that when the piston-rod D moves upward the gates will be lowered and that when it moves downward the said gates will rise. Now in order to lock the gates so that nobody can, by catching hold of them, raise them after they have been lowered to the limit of their downward movement or pull them down when they have reached the limit of their upward movement, I have provided means which are connected to the piston-rod and operate only when it has reached or is about to reach the limit of its upper or lower movement. These means consist, principally, of a sleeve F, which surrounds the upper part of the piston-rod and is provided with racks *c c* on either side of the same, which engage the segmental gear *a′* and *b′* of the gate-shafts. This sleeve is loose on the piston-rod, but is held suspended in such position as to engage said segmental gear by the coil-springs G G, surrounding said rod both above and

below said sleeve, whose pressure against said sleeve is regulated and equalized by gage-nuts *g g*. This sleeve is provided on one side with a longitudinally-elongated opening or slot *h*, out through which the stud *k*, projecting laterally from the piston-rod, extends. The outer end of stud *k* passes between two corresponding fingers *i i*, extending to the rear from the Siamese dog K immediately back of the pivot thereof and an equal distance on each side of an imaginary line drawn through the pivotal center of said Siamese dog K and the stud *k*. This Siamese dog K is pivoted on a suitable stud attached to and extending laterally from about the center of length of the sleeve F, and it consists of two arms *l l'*, extending from its pivotal center in opposite directions to each other and in a somewhat parallel course (more or less) with said piston-rod. Their extremities are shaped somewhat like an arrow-head with but one lobe, so as to provide a shoulder *m* and an inclined edge from said shoulder to the extremity of said arm. The throw of the piston-rod is such that, although the sleeve F ceases to move upward when the gates have been lowered to their horizontal position, the piston-rod itself continues to move a short distance farther. This additional movement of the piston-rod is such that the stud *k*, acting on the upper finger *i* of the Siamese dogs, causes the same to move, so that the upper arm catches onto a shoulder *r*, secured to or cast integral with the cover B with reference to the upper dog, and prevents the sleeve from moving downward by reason of any interference with the gates. When the piston-rod makes its start downward, however, the fact of the lower spring G being slightly compressed and the upper one correspondingly relaxed permits it to have a slight initial movement independent of said sleeve. This initial movement is sufficient to enable stud *k* to act on the fingers *i* of the Siamese dogs and to oscillate the latter, so as to release the upper dog from shoulder *r* and permit the sleeve to actuate the gates. When the gates have reached the limit of their upward movement, the piston-rod moves slightly farther downward, just sufficient for stud *k* to oscillate the dogs in such manner that the lower one engages and catches on a shoulder *s*, made in the box and located with reference to said lower dog. This holds the sleeve and gates stationary until the piston-rod commences its upward movement again, whereupon its slight independent initial upward movement through stud *k* causes the lower dog to release its hold on shoulder *s* and permits the gates to be lowered again.

Instead of the Siamese dog for locking the gates both when they are raised and lowered I can, if desired, have only one dog, which would lock the gates when down, (in which position they would be most likely to be interfered with,) but which would not lock the gates when raised. If I did this, I would dispense with the lower arm of said Siamese dog and the lower shoulder *s*, upon which said dog catches.

In speaking heretofore about injecting the air back of the piston, I mean providing an air-port in both chambers near the diaphragm. This would enable me to leave the outer ends of said cylinder entirely open and would avoid considerable expense for packing and for finishing the said stubs working in the chambers of said cylinder.

The air-pressure, which is supplied to the upper and lower chamber of the cylinder through the inlet-ports just referred to, is provided through the pipes I from the storage-tank M in the watch tower or house occupied by the gate-tender. I prefer to place this storage-tank below or on the outside of the watch-tower, so that there will be less likelihood of any condensation of the air by reason of the loss of heat when it is furnished to the cylinder. I keep this storage-tank suitably filled with compressed air by means of an air-pump P, which is manipulated by the gate-tender when not engaged in operating the gates. There leads from the storage-tank a pipe *o*, which is provided with a suitable three-way valve *x*, which is so constructed that it can connect the tank with the pipe I and open the pipe L to the free outside atmosphere, or vice versa, or which can be operated so as to close both the said pipes. This arrangement for providing the air to the cylinder is superior to anything of the kind which is known to me, because it enables the gate-tender (commonly an ignorant and poorly-paid man) to provide sufficient air-pressure in the storage-tank in the interim between the passage of trains, so that all he has to do is simply to manipulate the valve, which requires the least possible effort, to lower the gates upon the approach of the train promptly and quickly and to easily raise them when the train has passed.

I have heretofore referred to the box and cover holding the mechanism of my improved gate but slightingly. For economy's sake and for the purpose of easily enabling repairs to be made upon the removal of the cover I provide a ring or intermediate frame T to be made, which is placed between the flanges of the box and cover and secured by the same means that secures them in place. This ring is provided with open bearings, which, as shown in Fig. 6, project laterally therefrom into the interior of the box in alignment with said shafts. The shafts after being placed therein are prevented from working out of the same by the cover, which by having recesses made in its lower edge with reference to said shafts fits down snugly over the same, and when secured to the box acts as a pillow holding the shaft in its bearings. This ring has also extending downward from its ends, as shown, a U-shaped frame *t*, which at its lower bend is provided with a vertical guide-opening for the piston-rod, and is also provided with the shoulder *s*, projecting inward from one of its

vertical portions. While I prefer the addition of this ring or intermediate frame as one of the features of my invention, it is obvious it may be dispensed with.

Projecting down from the innermost surface of the uppermost part of the cover in alignment with the piston is a sort of pocket *v*, in which the upper end of said piston will rest when the same has reached the limit of its upward movement. This pocket confines and steadies the piston and avoids any lateral motion of the same by reason of any meddling or accident happening to the gates. I have also heretofore spoken of gates which are fastened to one end only of the shafts *a* and *b*. This is the old construction and one commonly used; but as I do not wish to claim anything particular in the construction of the gate *per se*, I wish to be understood as covering a gate secured to both ends of the shaft. The gate operating over the roadway is suitably counterbalanced by weights or otherwise; but the gate operating over the sidewalk does not possess this characteristic.

What I claim as new is—

1. The combination, with two railroad-crossing gates, horizontal shafts, on each of which one of said gates is secured, suitable gear, and a single post in which said shafts are journaled, of a vertically-reciprocal piston-rod movable between said shafts and engaging said gear and a cylinder for driving said piston, as set forth.

2. The combination, with two railroad-crossing gates, horizontal shafts, on each of which one of said gates is secured, and segmental gear located about the center of each of said shafts and projecting toward each other, of a vertically-reciprocal piston-rod movable between said gear, racks on the sides of the rod next said gear which mesh with the same, and a suitable cylinder for driving the piston, as set forth.

3. The combination, with two railroad-crossing gates, horizontal shafts, on each of which one of said gates is secured, and suitable gear thereon, of a vertically-reciprocal piston-rod moving between said shafts, a sleeve surrounding said piston-rod and balanced between and engaging said shafts so as to turn the same, a dog, substantially as described, pivoted to said sleeve, and a shoulder upon which said dog catches, said rod having a slight initial and terminal movement independent of said sleeve, whereby it is enabled to move said dog so as to make it catch and release its hold on said shoulder, and a suitable cylinder for actuating said piston.

4. The combination, with two railroad-crossing gates, horizontal shafts, on each of which one of said gates is secured, and suitable gear thereon, of a vertically-reciprocal piston-rod, a sleeve surrounding the same and suspended between and engaging said gear, a double dog pivoted to said sleeve, ledges or shoulders upon which said dogs catch, and a cylinder for actuating said piston-rod, said piston-rod having a slight initial or terminal movement independent of said sleeve, whereby it imparts to said dogs such movement that they alternately catch on and release themselves from said ledges or shoulders, as set forth.

5. The combination, with two railroad-gates, horizontal shafts, on each of which one of said gates is secured, and suitable gear thereon, of a vertically-reciprocal piston-rod moving between said shafts, a sleeve upon said piston-rod suspended between said gear and having racks on its opposite surfaces adjacent thereto, suitable springs pressing against the ends of said sleeve, and gage-nuts regulating their pressure thereon, a dog pivoted to said sleeve, a ledge on which said dog catches, and a cylinder for actuating said piston-rod, said rod having a slight initial and terminal movement independent of said sleeve, whereby it imparts to said dog such movement as will make it alternately catch on and release its hold from said ledge, as set forth.

6. The combination, with two railroad-crossing gates, horizontal shafts, on each of which one of said gates is secured, and suitable gear thereon, of a vertically-reciprocal piston-rod, a sleeve suspended thereon between said gear and having racks on opposite sides thereof which engage with the gear and having a longitudinal slot therein, springs surrounding said piston-rod, between which said sleeve is suspended, and gage-nuts for regulating the pressure thereof, a lateral stud projecting from said piston-rod out through said slot, a dog pivoted to the side of said sleeve, a suitable ledge upon which said dog catches, and a cylinder for actuating said piston-rod, said piston-rod having a slight initial and terminal movement independent of said sleeve, whereby the said lateral stud engages said dog and causes it to catch upon said ledge when arriving at the limit of its movement in one direction and to release its hold therefrom when it commences its movement in the opposite direction, as set forth.

7. The combination, with two railroad-crossing gates, horizontal shafts, on each of which one of said gates is secured, and a suitable gear thereon, of a vertically-reciprocal piston-rod moving between said shafts, a cylinder for actuating the same, a sleeve suspended in position thereon between said gear and engaging the same and having a longitudinal slot, the double dogs pivoted to the side of said sleeve and having fingers projecting oppositely therefrom, a lateral stud projecting from said piston-rod through said slot in the sleeve and between the fingers of said dog, and suitable ledges upon which said dogs catch, said piston having a slight initial and terminal movement independent of said sleeve, whereby the dogs alternately engage and release themselves from said shoulders, as set forth.

8. The combination, with a railroad-cross ing gate, a horizontal shaft to which said gate

is secured, and suitable gear thereon, of a vertically-reciprocal piston-rod moving past said shaft, a sleeve surrounding said piston-rod and balanced opposite and engaging said shaft so as to turn the same, a dog, substantially as described, pivoted to said sleeve, and a shoulder upon which said dog catches, said rod having a slight initial and terminal movement independent of said sleeve, whereby it is enabled to move said dog so as to make it catch and release its hold on said shoulder, and a suitable cylinder for actuating said piston-rod.

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