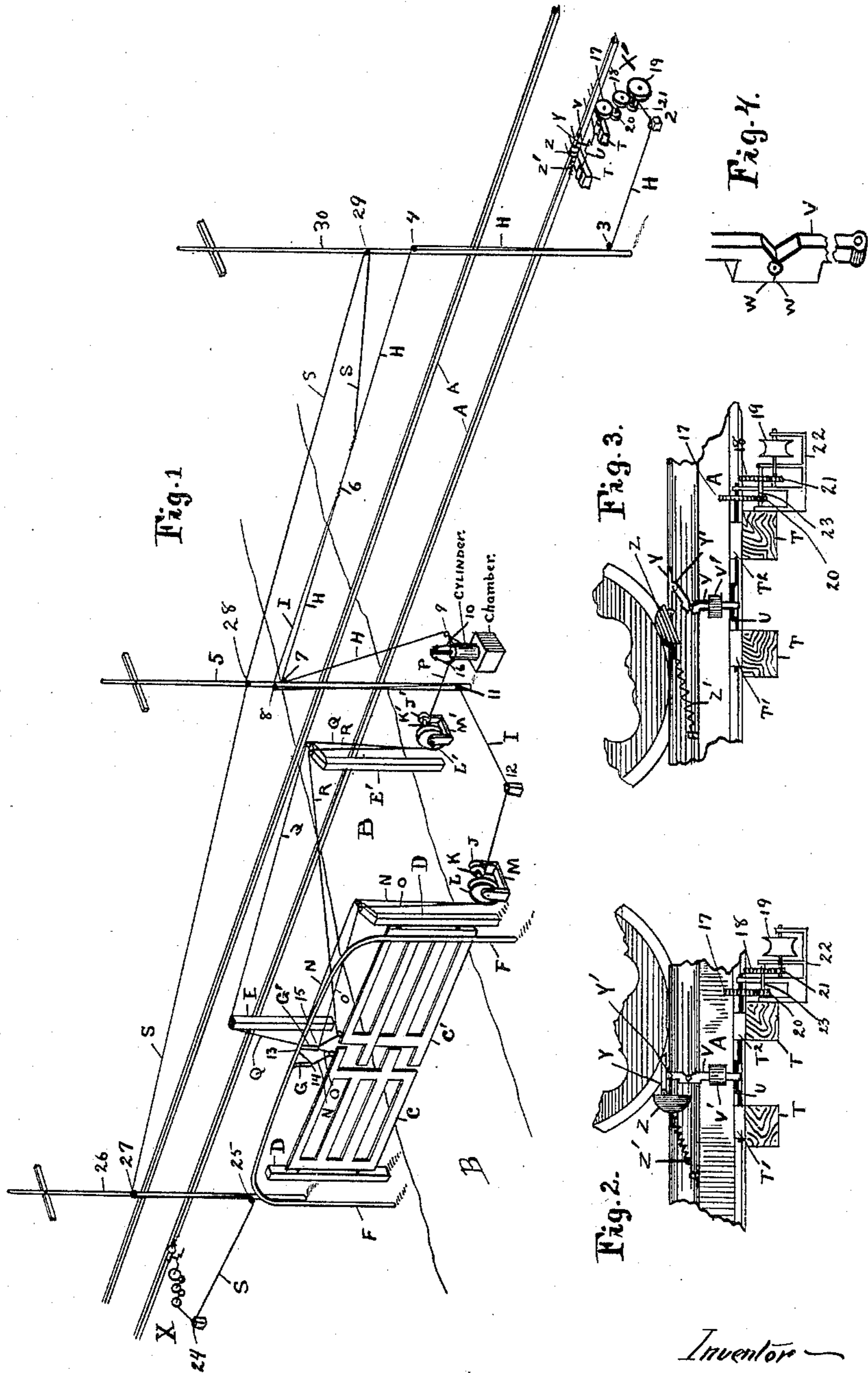


(No Model.)

M. T. SHEEHAN.
RAILWAY CROSSING GATE.

No. 465,032.

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Witnesses.-
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UNITED STATES PATENT OFFICE.

MICHAEL T. SHEEHAN, OF DELAVAN, ILLINOIS.

RAILWAY-CROSSING GATE.

SPECIFICATION forming part of Letters Patent No. 465,032, dated December 15, 1891.

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To all whom it may concern:

Be it known that I, MICHAEL T. SHEEHAN, a citizen of the United States, residing at Delavan, in the county of Tazewell and State of Illinois, have invented certain new and useful Improvements in Railway - Crossing Gates; and I 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 improvements in railway-crossing gates.

The object of the invention is to provide means whereby a gate or gates may be closed and opened automatically by the wheels of a train in approaching and leaving the crossing where the gates are set.

In the drawings hereto annexed, Figure 1 represents a perspective view of the device as applied to a railway-crossing. Fig. 2 is a detail view of the mechanism used at the side of the rail on which the wheels of the train impinge. Fig. 3 is also a view of the same mechanism used under the wheels of the train, showing the device in a different position. Fig. 4 is a portion of the operating mechanism described above.

The rails of the track are represented by the letters A A in the first three figures. B represents the road crossing the said rails or track.

C C' represent two gates which swing toward each other in closing. The gates are hinged or hung from two posts D D, respectively. The gates, as a matter of course, hang over the road when closed, and when standing open the free ends of the said gates rest against or near the posts E E'.

F F is an arch, of metal or wood, which overhangs the road and near the center of which two depending arms G G' are placed. It will be at once understood that the gates are operated by wires or ropes or the like. To accomplish the results desired, a device is placed at X and X' at the side of one of the rails of the track, one on either side of the wagon-road. This, however, is to be hereinaf-

ter described. A wire or rope H is attached in a suitable manner and at a suitable place on the said device at X', and from there the said wire passes around a pulley at 2, thence to a second pulley at 3, which is located on a telegraph or other pole 30. Then the wire passes up to a third pulley at 4 on said post, and then stretches to a second post 5, but before reaching the said post a second wire I is attached to the wire H at a point 6, as shown. From 6 the wires H and I pass over the pulleys 7 and 8, respectively, and from the pulley 7 the wire H passes downward and is connected to the end of the piston-rod of an air-compressing pump after passing under two pulleys 9 and 10, and there said wire terminates. The wire I, after passing over the pulley 8 on post 5, also passes downward under a pulley 11 on said post, around a pulley 12 on a short post, and thence to a small pulley J, where the said wire I terminates. The said pulley J is rigidly attached to a shaft K, and on the same shaft is also rigidly secured a much larger pulley or drum L. The shaft K is journaled in any substantial manner in a suitable frame or standard M, as shown. This drum L is grooved to receive two wires N and O, whose ends are attached to the periphery of said drum or pulley. The said wires N and O extend from the drum L upward and pass over a pair of pulleys on the post D, as shown. The wire N passes to pulley 13, situated on the before-described arch F. Thence the said wire passes under a pulley 14 at the end of the depending arm G, and from this pulley the wire attaches to an eye or the like on the top of the gate C. The wire O, after leaving the series of pulleys on the post D, passes along beneath the arch F, and, passing over a pulley 15 on the end of the depending arm G', attaches to a second eye or the like on the gate C', as shown. This portion, as described, represents the part for the closing of the gates.

The operation of the various parts will be described hereinafter.

The portion of the device used for opening the gates after being closed may be described as follows: To the free end of the piston-rod of the compressing-pump is attached a wire P, as shown, which passes un-

der a pulley 16 on the said pump, and then to a pulley J' on a shaft K' of the standard M' in similar manner as the one before described. A large drum or pulley L' is secured to the shaft K' in the same manner as heretofore described, and the two wires Q and R, being attached to the periphery of the said drum, pass therefrom up and over a series of pulleys on the post E'. Thence the wire Q passes around a pulley on the post E and onto the gate C, while the wire R leaves the pulley on the post E' and stretches directly to the gate C', both of said wires attaching to the same eye as the wires N O, as before described. This construction constitutes the arrangements for opening the gates.

The device used at the side of the track at X and X' for operation by the wheels of the passing train is more clearly shown at Figs. 2 and 3, in which A represents the rail, and T T two of the cross-ties. T' T² represent two boxings or bearings, which are bolted to the said ties and which carry a crank U, as shown. Attached to this crank U is a hinged rod V, which is maintained in an upright position by the guide V', which guide is simply a lug made with the rail or bolted thereto and through which said rod V slides. As before stated, the rod V is hinged, as more clearly shown at Fig. 4, in which W W represents the two halves of the hinge. The object of this will be more fully described later on. The upper end of this rod is surmounted by a plate Y, which is pivoted to the said rod at Y', and at one end of this plate Y is a half-ball Z, the flat portion of which is pivotally attached to the said plate Y, while the rounded portion is attached to a spring Z', as shown. The other end of the spring is attached to a lug on the rail, and by the tension of the said spring the rod V is always kept in an upright position, except when the wheel of a train passes over it from a certain direction.

The crank U, with its extended shaft, carries on the outside of one of the bearings T² a cog-wheel 17, which gears to a much smaller cog-wheel 20, placed on a shaft 23, and which shaft 23 also carries a large cog-wheel 18, and this cog-wheel in turn meshes with a second smaller cog-wheel 21, and the shaft which carries this gear-wheel also carries a drum 19, which is the take-up drum for the wires already referred to. All of the shafts carrying cog-wheels in this way are journaled in a standard 22, as shown. An arrangement of this character is placed on each side of the cross-road at any distance most advantageous from the said road. The wire H is attached to the periphery of the drum 19 of the device described, and as the device operates by the pressure of the wheels when passing over it the said drum takes up or releases the said wire H. The operating device placed at X is made in the same way, except that the plate Y and half-ball Z are placed in oppo-

site positions. In other words, the said half-balls both point toward the cross-road or toward each other. The drum on the device at X is also a take-up for the wire S, which wire S passes from the said drum to a pulley at 24, thence to a pulley at 25 on the post 26, thence to a pulley higher up at 27 of said post 26, thence across the road to a pulley 28 on post 5, thence to a pulley 29 on post or pole 30, and there turns back toward the direction from which it came and attaches to the wire H, and thus gets the pull on the gates and air-pump the same as the wire H.

The operation of the whole device is as follows: As the train approaches the crossing—say from the right in the drawings—the wheels strike first upon the plate Y, (better shown at Fig. 2,) and the spring Z' being strong enough to resist any pull likely to be imposed on said plate Y by the friction of the wheels with said plate force the rod V downward, and the backs of the hinges at W W come firmly together when the wheels strike the plate, so that there is no danger of buckling. In other words, the rod remains perfectly rigid throughout, and as the said rod is forced downward the crank U is also pushed downward. The end of the crank-shaft, being rigid with the cog-wheel 17, turns said cog a distance equal to the distance traveled by the said crank U, and the cog-wheel 20, being smaller than the one just mentioned, must make perhaps one or two revolutions, thus revolving the cog-wheel 18 the same number of times, and thus revolving the smaller wheel 21 a still greater number of times, and the take-up drum 19 revolves a sufficient number of times to take up enough of the wire H, operate the air-pump, and to close the gates. As the wire H is drawn onto the drum 19, the said wire is drawn over the pulleys 2, 3, 4, 7, 9, and 10, thus drawing down the piston-rod of the air-pump, and as said piston-rod lowers the wire P is loosened or slackened, thus allowing the pulleys J' and L' to move freely, and the wire I is pulled the same distance as the wire H is, and this movement of said wire H draws on the wire I and unwinding it from the pulley J and winding the wires N and O upon the drum L, thus closing the gates. As the gates close, the wires Q and R are drawn off of the drum L', this being permitted by the slackening of the wire P, as already mentioned. After the train has passed the crossing the wheels come in contact with the operating mechanism at X, and as the device is set in the opposite direction to the one at X' the wheels strike the half-ball Z first, Fig. 2, drawing on the spring Z' and forcing the half-ball and plate in an angling direction downwardly, and by this movement the lower part of said rod V is not moved in the least, thus no drawing on the wire S takes place. After each wheel strikes and passes over the plate Y, half-ball, &c., said half-ball and plate always regain their normal position by reason of the pull of the

spring Z', no work being done by the passage of wheels over said device in this instance, for, as before described, the rod V being hinged allows said plate and half-ball to lower without moving any of the pulleys or cog-wheels. After the train has passed the device at X' the gates immediately begin to open,*from the fact that after the wheels have passed the mechanism for closing the gates and operating the air-compressor the air in said compressor begins to expand, thereby raising the piston-rod again and drawing on the wires P, Q, and R, these having been made tight by the closing of the gates and also drawing on the wire H and drawing the operating mechanism X and X' back to their normal positions, and as the gates open the wires N and O are drawn through their pulleys and wind the wire I on its pulley again at J ready for a second operation.

It may be understood that all of the wires and necessary parts may be placed underground out of the weather, except the operating mechanism above the rod V, which as a matter of course must be left for the wheels to strike upon. A pair of gates may be placed at the other side of the track, if desired, and operated by the same pump, it only requiring a pump sufficiently large to do the work. The drums spoken of in the above must of course be large enough in diameter to take up enough wire to open or close the gates, and the gear or cog wheels must be of such size with relation to each other that by the simple movement of the crank U through a space of, say, two or three inches the series of cog-wheels will at last, through their work, revolve the drum 19 to such an extent as to

take up all of the wire needed for the perfect operation of the device.

I claim—

1. In railway-crossing gates, the gates C and C', and wires or ropes Q and R, N and O, attached thereto, said wires being in combination with their respective pulleys, take-up drum L', pulley J', wire P, the air-compressing pump, take-up drum L, pulley J, wires I and H, and operating devices X and X', all working together in the manner and for the purposes herein set forth and described.

2. In railway-crossing gates, the gates C and C', in combination with wires N and O, drum L, wire I, wire H, and operating mechanism X', in the manner and for the purposes set forth and described.

3. In railway-crossing gates, the operating mechanism X and X', consisting, substantially, of the half-ball Z, hinged to the plate Y, spring Z', hinged rod V, crank and shaft U, cog-wheels 17, 20, 18, and 21, and take-up drum 19, all working together in the manner and for the purposes herein set forth and described.

4. In railway-crossing gates, the gates C and C', in combination with the wires Q and R, take-up drum L', wire P, the air-compressing pump, wire H, and the operating mechanism X', substantially as described.

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

MICHAEL T. SHEEHAN.

Witnesses:

MICHAEL GLASHEEN,
W. H. AMBROSE.