

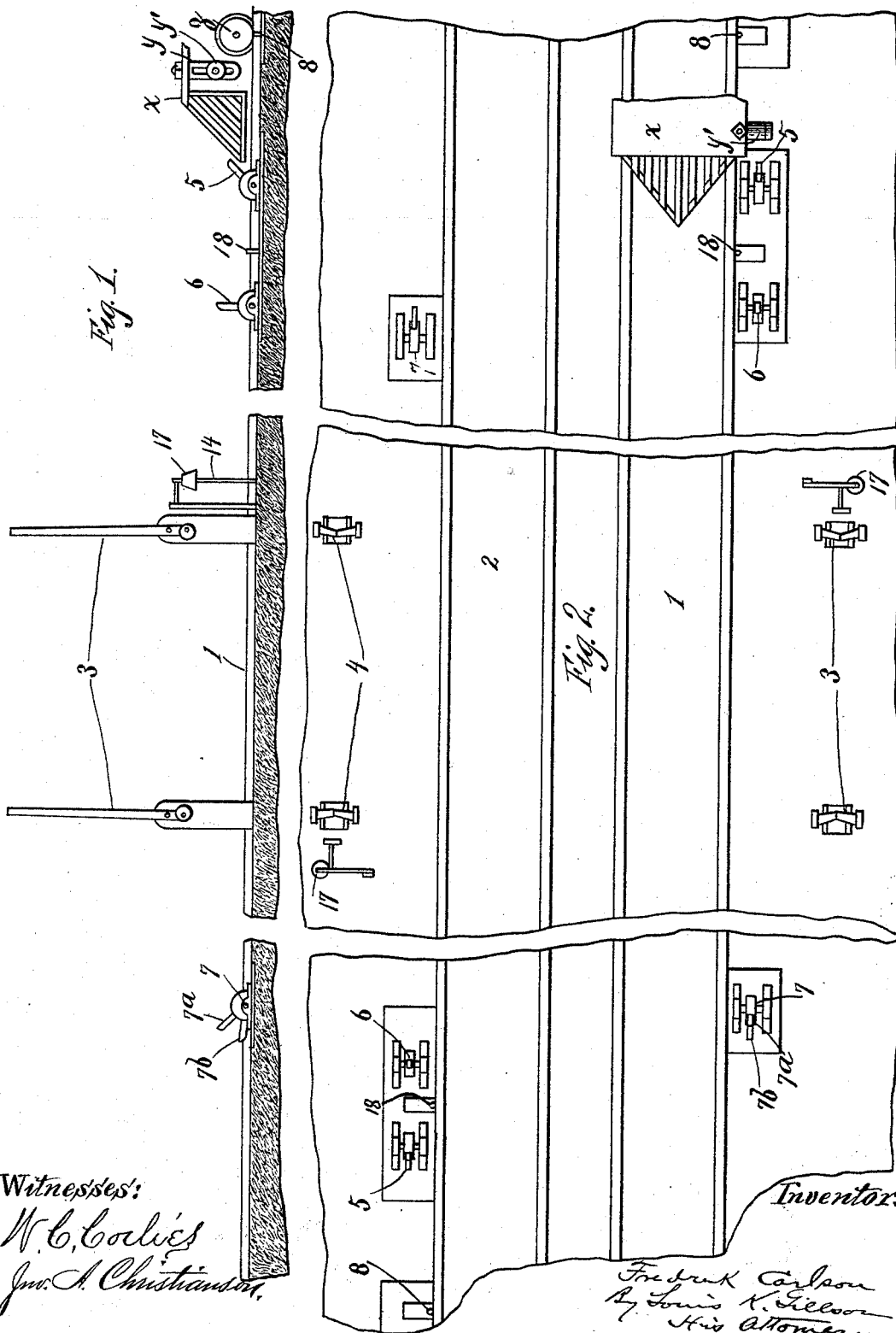
(No Model.)

4 Sheets—Sheet 1.

F. CARLSON.  
RAILWAY GATE.

No. 526,770.

Patented Oct. 2, 1894.



Witnesses:  
W. C. Corlies  
Jno. A. Christensen

Inventor:

Fredrick Carlson  
By Louis K. Gilson  
His Attorney

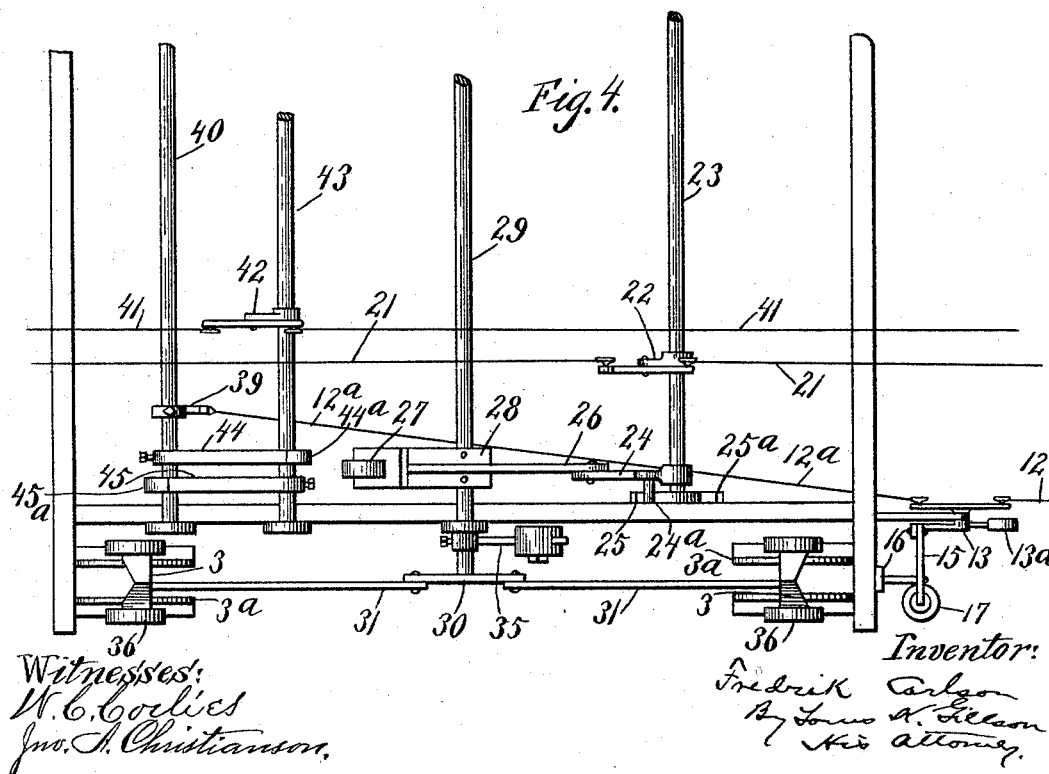
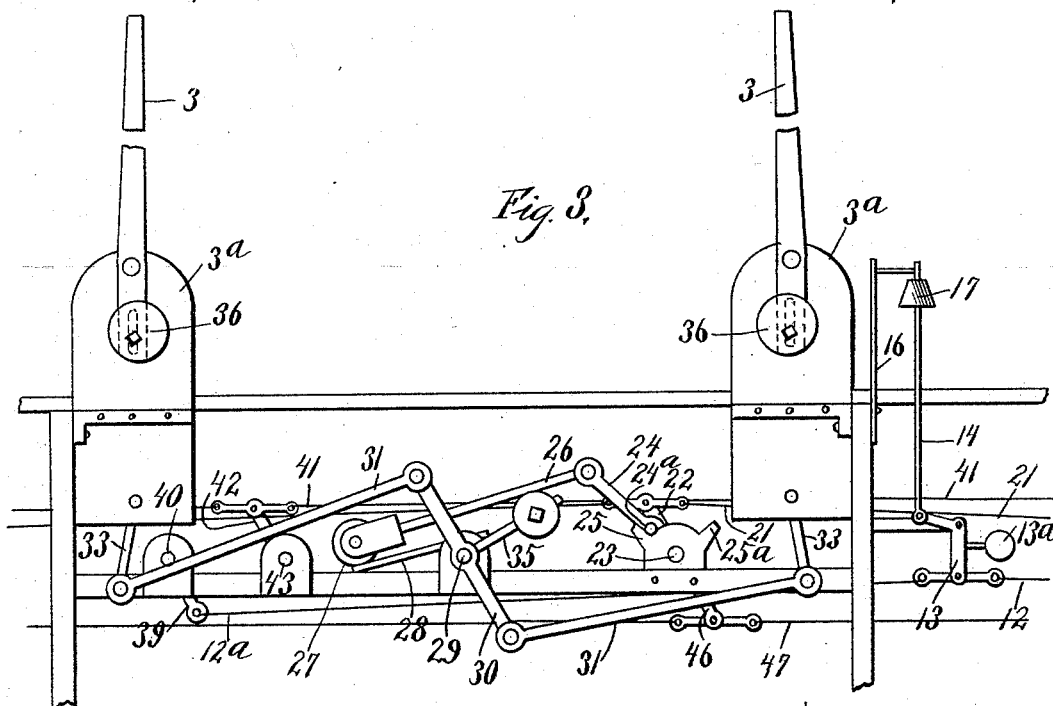
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4 Sheets—Sheet 2.

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4 Sheets—Sheet 3.

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Fig. 5.

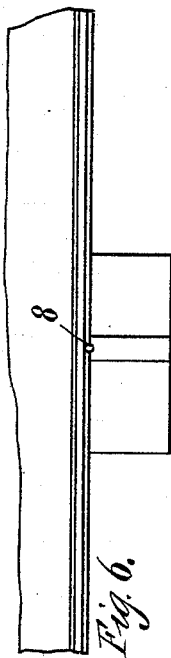
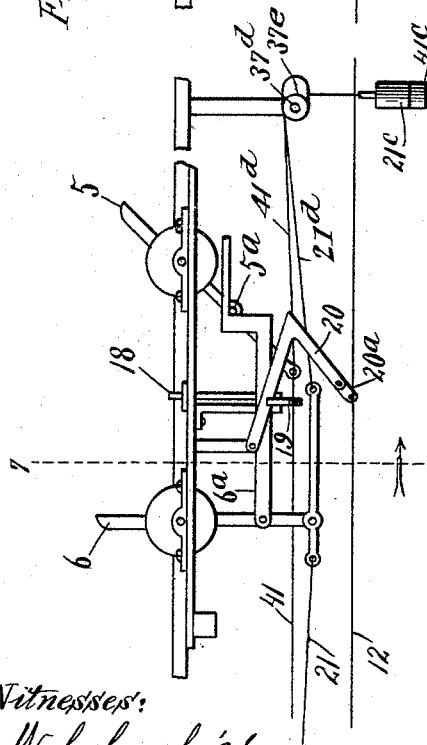


Fig. 6.

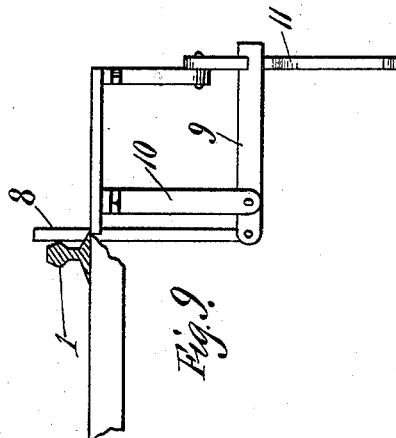


Fig. 7.

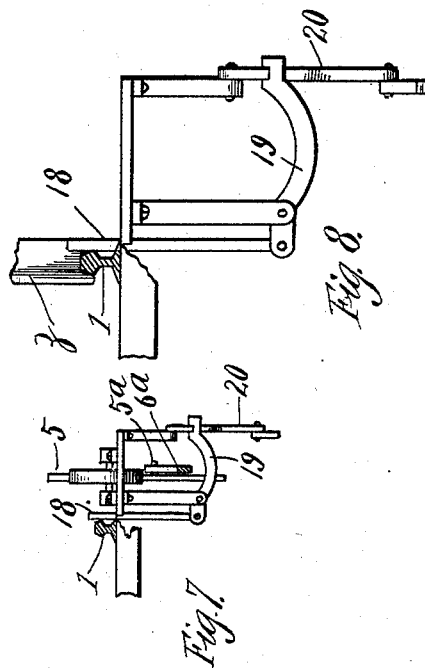


Fig. 8.

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(No Model.)

4 Sheets—Sheet 4.

F. CARLSON.  
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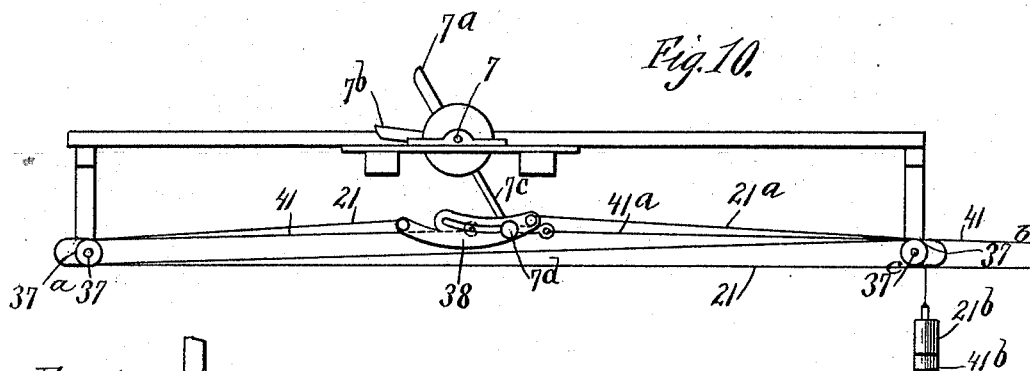


Fig. 11.

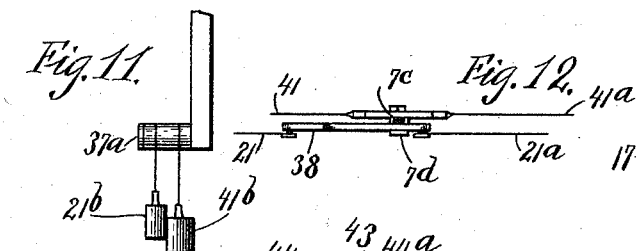


Fig. 12.

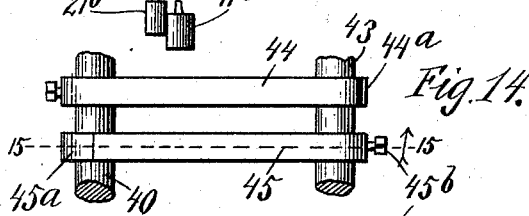


Fig. 14.

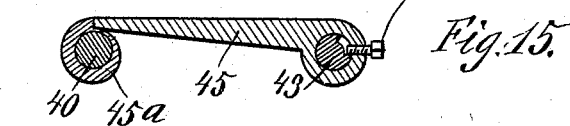


Fig. 15.

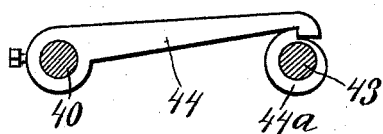


Fig. 16.

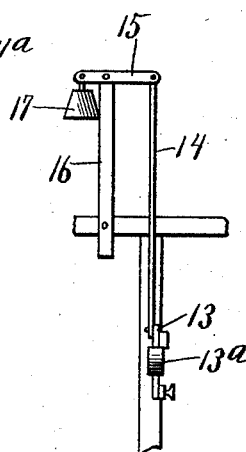


Fig. 13.

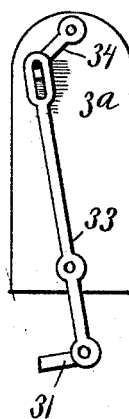


Fig. 17.

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# UNITED STATES PATENT OFFICE.

FREDRIK CARLSON, OF CHICAGO, ILLINOIS.

## RAILWAY-GATE.

SPECIFICATION forming part of Letters Patent No. 526,770, dated October 2, 1894.

Application filed January 15, 1894. Serial No. 496,914. (No model.)

### *To all whom it may concern:*

Be it known that I, FREDRIK CARLSON, a subject of the King of Sweden and Norway, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Railway-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.

My invention relates to railway gates. Its object is to provide means for automatically closing the gates across a street at a railway crossing as a train approaches and opening them as it passes the street.

It has for a further object the provision of means for keeping the gates closed should a train cross the street upon one track immediately after one has passed upon the other. Means is also provided for automatically locking the mechanism so that it may not be easily tampered with.

The invention consists of the use of sweep gates normally open by the action of a weight, and adapted to be closed by the action of a heavier weight which is adjustable upon a crank arm, and means for shifting this second weight by the action of the locomotive.

It consists further in the use of a signal bell located at the street crossing and connected with a trip placed near the track some distance from the street so as to be actuated by the approaching train, and mechanism controlled by the same trip for locking the gate shifting mechanism.

It consists further in the use of additional trips, levers and cables whereby the gate opening mechanism is thrown out of action by a second train approaching before the first one has crossed the street.

It consists further in such parts and arrangements of parts not already enumerated as are hereinafter particularly described.

In the accompanying drawings, Figures 1 and 2, are diagrammatic, the one being a side elevation of a railway track showing the gates and the trips used in connection therewith

and the other being a plan view of the same. Fig. 3, is a side elevation of the gates and their operating mechanism. Fig. 4, is a plan view of the same. Fig. 5, is a side elevation of the alarm and gate closing trips. Fig. 6, is a plan view of the same. Fig. 7, is a transverse vertical section on the line 7-7, of Fig. 5. Fig. 8, is a similar view with some of the parts removed. Fig. 9, is a transverse vertical section on the line 9-9 of Fig. 5. Fig. 10, is a side elevation of the gate opening trip. Figs. 11 and 12, are details of the mechanism connected therewith. Fig. 13, is an elevation of the alarm bell and its actuating mechanism. Figs. 14, 15 and 16, are details of the locking device. Fig. 17, is a detail of the lever movement for actuating the gates.

The device as shown is adapted for use in connection with a double track railway, upon which the usual rule is observed of running trains in one direction only upon each track. Inasmuch as the trip mechanism and its connection with the shafts and levers for moving the gates, is the same upon one side of such a railway as upon the other, I have deemed it necessary to show in detail one set only; and for the sake of clearness have omitted from some of the figures, particularly in Fig. 3, some of the cord and crank arms pertaining to the trips upon the opposite side of the track, which would be seen from the point of view from which the drawing is made.

The two railway tracks are indicated at 1 and 2, and ordinary sweep gates upon opposite sides of the railway are shown at 3 and 4. These gates are mounted in the usual manner upon standards, as 3<sup>a</sup>; and carry at their rearward ends counter balancing weights, 36, placed slightly eccentric to the central line of the gates, so that when the latter are vertical the weights tend to start them downwardly. The pivotal shaft of each gate is provided with a crank arm 34, having a pin in engagement with a rocking lever, 33, which is connected by a rigid link, 31, with a crank arm 30, carried by a shaft, 29, so that the rotation of this shaft lowers and raises the gates.

A crank arm 28, attached to the shaft 29, is adapted to carry a weight, 27, in the form of a roller, which, when at the outer end of the crank arm outweighs the gates and raises

them. When the roller is withdrawn to the shaft end of the crank arm the gates fall by their own weight.

A weighted crank arm, 35, is mounted upon the shaft 29, projecting oppositely from the crank arm 28, and serving as a counter balance for the latter.

The shifting of the weight 27, is accomplished in the following manner: A trip lever, 6, is located at the side of the track, and as far removed from the street crossing as may be desired, and is in such position that when it stands vertically, as shown in Figs. 1 and 5, it is adapted to be struck by a roller,  $y'$ , carried by an arm  $y$ , projecting from the table of the pilot,  $x$ , of the locomotive. When so struck the lever, 6, is thrown down, its lower end being thrown backwardly from the street crossing. A cable 21, runs from the lower end of the lever, 6, to a crank arm 22, carried by a shaft 23, which also carries a crank arm, 24, which is connected by a rigid link, 26, with the heavy roller 27, so that as the shaft 23, is turned by the movement of the lever 6, the roller 27, is drawn backwardly from the outer end of the crank arm 28. The crank arm 24, is provided with a laterally projecting pin  $24^a$ ; and stop lugs  $25$ ,  $25^a$ , are so placed as to be in the line of the movement of this pin and limit the movement of the crank arm 24. The cable 21, is continued beyond the crank arm 22, so as to connect with the gate closing trip upon the opposite side of the street and indicated at 7. This trip is provided with two arms,  $7^a$ ,  $7^b$ , for contact with the locomotive. The latter arm is for a purpose to be hereinafter described. When in the inclined position, shown in Fig. 10, the top of the arm  $7^a$ , is too low for contact with arm  $x$ , of the locomotive. It is brought into a vertical position and hence into a position for contact with the arm  $y$ , when the lever 6, is thrown down. The downwardly projecting arm,  $7^c$ , of the trip 7, is provided with a lateral stud pin,  $7^d$ , projecting through a slot in a plate 38. The cable 21, is turned over a sheave 37, farther removed from the street than the trip 7, and is attached to the plate 38. When the gates are up the pin  $7^d$ , is at the end of the slot in the plate 38, farthest removed from the point of attachment of the cable 21, so that as the cable is drawn by the movement of the lever 6, as the latter is thrown down, it brings the arm  $7^a$ , into a vertical position, and when this arm is again thrown down to the position shown in Fig. 10, by the contact with the locomotive, the cable is drawn in the opposite direction. The shaft 23, is so turned as to force the roller 27, to the outer end of the crank arm 28, thereby raising the gates, and by the same action the lever 6 is restored to its vertical position in readiness for the next train which may approach.

It will be understood that the trip mechanism upon the other side of the track is similarly actuated as it is connected in the same

manner to the shaft 23, so as to move it in the same direction. This connection is believed to be sufficiently shown by the crank arm 46, and the cable 47, to enable a skilled mechanic to duplicate the parts already described.

It is obvious that if one train passes the gate closing trip before a previous train has actuated the gate opening trip, provision must be made for preventing the train in advance from opening the gates. Such a contingency is provided for and the closure of the gates, until after the passage of the second train, insured, by the following described mechanism: A trip, 5, similar to and located near but farther removed from the street than the trip, 6, is so controlled by the latter that it is raised to a vertical position as the gates are closed. The downwardly projecting end of the lever 5, is armed with a laterally projecting stud pin,  $5^a$ , upon which rests a bar,  $6^a$ , which is pivotally connected with the lower end of the trip lever 6, and which is provided with a shoulder for contact with the pin,  $5^a$ , so that the movement of the lever 6, as it is thrown over is communicated to the lever 5, raising it to a vertical position in readiness for contact should another train approach while the gates are closed. A cable 41, leads from the lower end of the trip lever 5, over a sheave  $37^a$ , located near the sheave 37, and is attached to the arm  $7^c$ , of the trip 7. The movement of the trip lever 5, in conjunction with the lever 6, does not, of course, change the relative positions of the stud pin  $7^d$ , and the plate 38. Should the trip lever 5, however, be thrown down by contact with the locomotive the trip 7, would be still further shifted so as to throw its arm  $7^a$ , down in the direction opposite from that shown in Fig. 10, and bring the arm  $7^b$ , into a vertical position, the plate 38, not having been shifted, however, as the pin  $7^d$ , has been moved in its slot.

It will be seen that when the first train reaches the gate opening trip, 7, it will now come in contact with the arm  $7^b$ , and, throwing it down, will return the pin  $7^d$ , to the end of the slot in the plate 38, without moving this plate and consequently without actuating the gate opening mechanism but leaving the arm  $7^a$ , in a vertical position and ready for contact by the second train, which will throw it down and thereby open the gate. The mechanism on both tracks acting together it is immaterial which track the second train be upon. When the lever  $7^b$ , is struck by the engine, and thrown down, the movement is communicated by means of the cable 41, to the trip lever 5, and it is returned to a vertical position, ready to be thrown backwardly to the position shown in Fig. 5 when the arm  $7^a$ , shall be struck by the second locomotive.

It is important that timely warning should be given to passers by before the gates are lowered. Accordingly an alarm bell, 17, is mounted upon a post near the street, being

supported by one end of a rocking lever, 15, the opposite end of which is connected by a link, 14, with one arm of a bell crank, 13, the other arm of which communicates with the trip, 8, located beside the rail and farther removed from the street than the trip lever 6. The trip, 8, is shown as being adapted for contact by the wheels of the train so that it will be struck repeatedly and the alarm prolonged.

The trip 8, is shown as a vertical rod, connected pivotally with the short end of a lever, 9, fulcrumed to a hanger, 10, and having its long end supporting a swinging lever 11, so that when the end of the trip, 8, is struck by the wheel, the lever 11, is raised. The latter lever is bent so that its swinging end is approximately perpendicular, and to this end the cable, 12, is attached. The lever, 9, is transverse to the track, and the lever 11, parallel with it, so that the impulses communicated to the lever 11, by action upon the trip 8, pull upon the cable 12, and ring the bell 17. A weight 13<sup>a</sup>, is provided for returning the parts to the positions held before contact with the trip 8, the weight of the levers 9 and 11, being sufficient to raise the trip. Provision is made for again sounding the alarm bell, immediately before the gates are lowered, consisting of a trip 18, and levers 19, 20, all substantially duplicates of the trip 8 and its levers, and located adjacent to the trip lever 6. The lever 20, is attached to the cable 12. In order that the trip 18, and its mechanism may not be disturbed by the sounding of the alarm by the trip 8, the lever 20 is jointed as shown at 20<sup>a</sup>, near its point of attachment to the cable 12, so that its end is free to swing as the cable reciprocates.

Means for locking the devices so that it cannot be readily tampered with, consists of the following mechanism: It will be seen that when the roller 27, is withdrawn to permit the gates to fall, movement is communicated to the cable 41. This cable is attached to a crank arm 42, of a shaft 43. An arm 44 rigidly fixed to a shaft 40, has its end hooked so as to engage a stop shoulder of a cam 44<sup>a</sup>, mounted upon the shaft 43. When these parts are engaged the shaft 43, is prevented from turning in the direction it must take when the mechanism is so moved as to lower the gates. The cable 12 is prolonged beyond the bell crank 13, as shown at 12<sup>a</sup>, and attached to a crank arm 39, mounted upon the shaft 40. The first contact of the locomotive with the trip 8, causes the shaft 40, to turn so as to lift the hooked arm 44, and disengage it from the cam 44<sup>a</sup>. The arm 44, is prevented from falling by a latch 45, so mounted upon the shaft 43, as to be capable of some vertical play and having its end resting upon a cam 45<sup>a</sup>, mounted upon the shaft 40, and having a stop shoulder so disposed that when the shaft 40, is turned by the strain of the cable 12<sup>a</sup>, the latch 45, falls behind it and prevents the arm 44, from dropping when the

strain of the cable 12<sup>a</sup>, is relieved. The latch 45, is loosely mounted upon the shaft 43. It has a set screw 45<sup>b</sup>, extending through its hub into a recess in the shaft 43, which recess extends a short distance, circumferentially, so as to admit of the necessary play of the latch 45, to enable it to engage the stop shoulder of the cam 45<sup>a</sup>. This recess is so short, however, that when the shaft 43, is turned by the movement of the cable 41, the latch 45, is freed from contact with the shoulder of the cam 45<sup>a</sup>, and the arm 44, is permitted to fall, so as to rest upon the surface of the cam 44<sup>a</sup>, and re-engage the shoulder when the shaft 43, is returned to the position it occupies when the gates are up.

The cables 21, 41 are prolonged at each end beyond the trips, as shown at 21<sup>a</sup>, 41<sup>a</sup>, Fig. 10, and 21<sup>d</sup>, 41<sup>d</sup>, Fig. 5, and are turned over sheaves 37<sup>b</sup>, 37<sup>c</sup>, Fig. 10, and 37<sup>d</sup>, 37<sup>e</sup>, Fig. 5, weights 21<sup>b</sup>, 41<sup>b</sup>, being attached to them for holding the cables 21, 41 taut.

It will be understood that all the mechanism for actuating the gates and the alarm bell, save only the trips, is below the surface of the ground. It is not deemed necessary to enter into a description of the frame work necessarily constructed below the tracks, to provide suitable support for the shafts, &c., forming the essential part of the mechanism.

It will be seen that should a train run in the opposite direction from that which is customary—a very unusual occurrence—the several trip levers will be thrown down without imparting strain to the cables to which they are attached and will be immediately restored to their normal position by the action of the weights, provided for keeping the cables taut.

I claim—

1. In a railway gate the combination with sweep-gates weighted so as to be out of balance, of crank arm, 28, adapted to move the gates, a weight 27, movable upon the crank arm, a trip for shifting the weight so arranged as to be thrown by a railway train, and means of connection between the trip and the weight, substantially as described and for the purpose specified.

2. In a railway gate the combination with sweep gates, trips for controlling said gates so arranged as to be thrown by a railway train, and means for connecting the trip with the gates, of a lock for holding the gates open, a trip for releasing the lock located for contact by the railway train before its contact with the gate closing trip, and means of connection between such trip and the lock, substantially as described and for the purpose specified.

3. In a railway gate the combination with sweep gates, trips for controlling the closure of such gates, trips for controlling the opening of the gates and means of connection between the trips and the gates, of a trip for throwing the gate opening trip out of service if struck between the movement of the gate closing and that of the gate opening trips, all

of said trips being so arranged as to be thrown by passing trains, substantially as described and for the purpose specified.

4. In a railway gate the combination with sweep gates of trips, 6, for controlling the closure of the gates, trips 7, for controlling the opening of the gates, trips, 5, for throwing the trips 7 out of service if acted upon between action upon the trips 6 and 7, trips, 7<sup>b</sup>, for bringing the trips 7 again into service, and means of connection between the several trips and the gates whereby the trips 5 and 7 are raised as the gates are closed and the trips 5 lowered and the trips 6 raised as the gates are opened, all of said trips being so arranged as to be thrown by passing railway trains, substantially as described and for the purpose specified.

5. The combination with sweep gates, weighted to be normally closed, of a rocking shaft, 29, crank arms and connecting rods for connecting the shaft with the gates, a crank arm 28, fixed to the shaft 29, a weight 27, adjustable upon the crank arm whereby the gates may be raised by shifting the weights to the outer end of the crank arm and allowed to fall by shifting it to its inner end, and means for shifting the weight 27, substantially as described and for the purpose specified.

6. The combination with sweep gates, weighted to be normally closed, of a rocking shaft, 29, crank arms and connecting rods for connecting the shaft with the gates, a crank arm 28 fixed to the shaft 29, a weight 27, adjustable upon the crank arm whereby the gates may be raised by shifting the weight to the outer end of the crank arm and allowed to fall by shifting it to its inner end, oppositely acting trip levers 6, 7, located near a railway track and adapted to be thrown down by a passing train, and cables connecting said trip levers with the weight 27, the trip levers

being so disposed that as the one is thrown down the other is raised, substantially as described and for the purpose specified.

7. The combination with sweep gates, weighted to be normally closed, of a rocking shaft, 29, crank arms and connecting rods for connecting the shaft with the gates, a crank arm 28, fixed to the shaft 29, a weight 27, adjustable upon the crank arm whereby the gates may be raised by shifting the weight to the outer end of the crank arm and allowed to fall by shifting it to its inner end, oppositely acting trip levers, 6, 7, located near a railway track and adapted to be thrown down by a passing train, and cables connecting said trip levers with the weight 27, the trip levers being so disposed that as the one is thrown down the other is raised, a trip lever, 5, adapted to be raised by the depression of the lever 6, a cable connecting the levers 5 and 7, and a second arm, 7<sup>b</sup>, to the trip lever 7, substantially as described and for the purpose specified.

8. The combination with sweep gates, weighted for self closure, of a counter weight for opening the gates, a crank arm for carrying the counter weight, cables for oppositely shifting the counter weight, trip levers 6, and 7, so arranged as to be thrown by a railway train, a lock latch for normally holding the trip levers, an alarm bell, a trip 8 adapted to be depressed by the train, cable connection between the trip 8 the bell and the lock latch whereby the depression of said trip sounds the alarm bell and releases the lock, substantially as described and for the purpose specified.

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

FREDRIK CARLSON.

Witnesses:

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M. H. L. WING.