April 16, 1929. C. H. GAGE ET AL 1,709,344

RAILWAY GATE

Original Filed Sept. 2, 1926 3 Sheets-Sheet 1

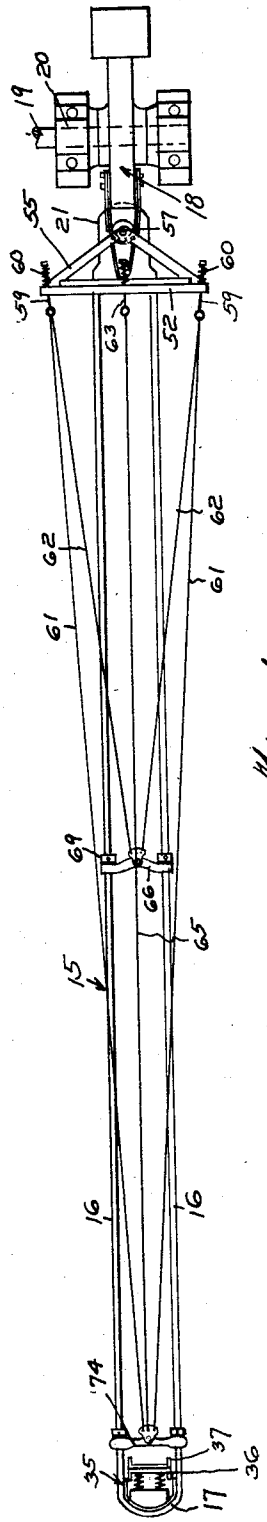


Fig. 1.

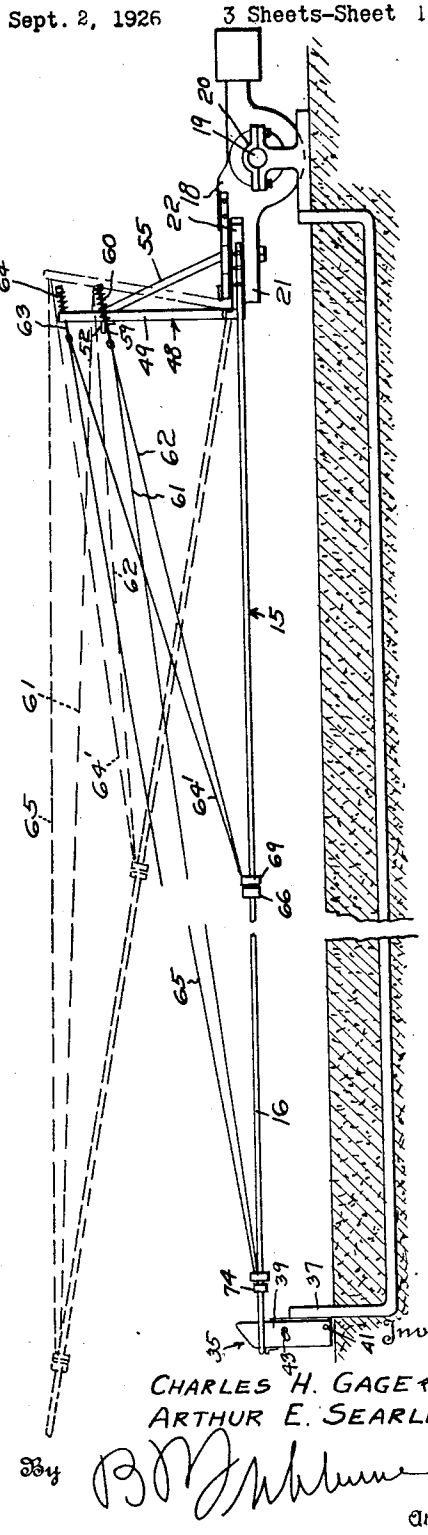


Fig. 2.

Inventors
CHARLES H. GAGE AND
ARTHUR E. SEARLES,
By
Attorney

April 16, 1929. C. H. GAGE ET AL 1,709,344

RAILWAY GATE

Original Filed Sept. 2, 1926 3 Sheets-Sheet 2

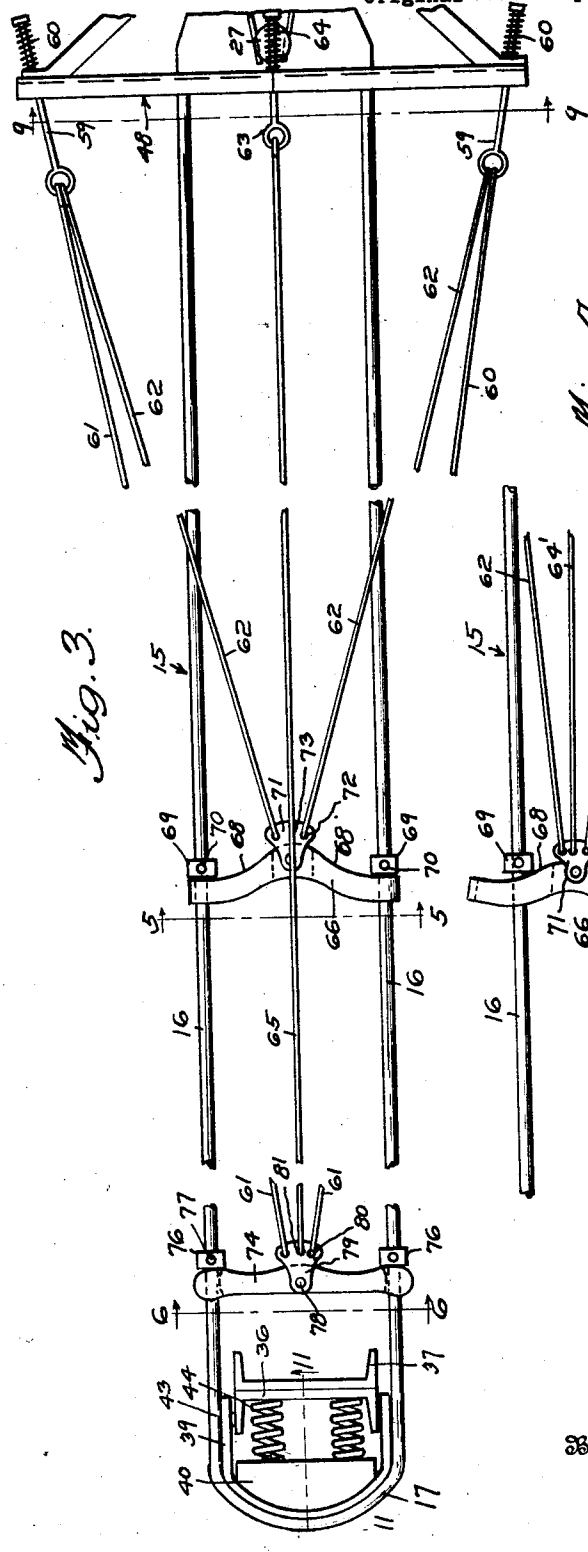


Fig. 3.

Fig. 4.

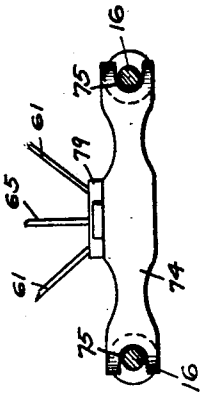


Fig. 6.

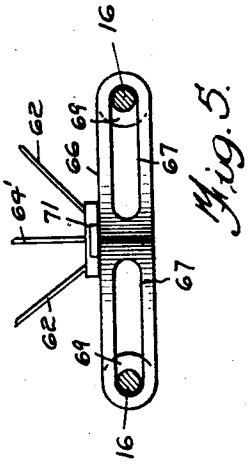


Fig. 5.

Inventors
CHARLES H. GAGE AND
ARTHUR E. SEARLES,
By
Attorney

April 16, 1929. C. H. GAGE ET AL 1,709,344

RAILWAY GATE

Original Filed Sept. 2, 1926 3 Sheets-Sheet 3

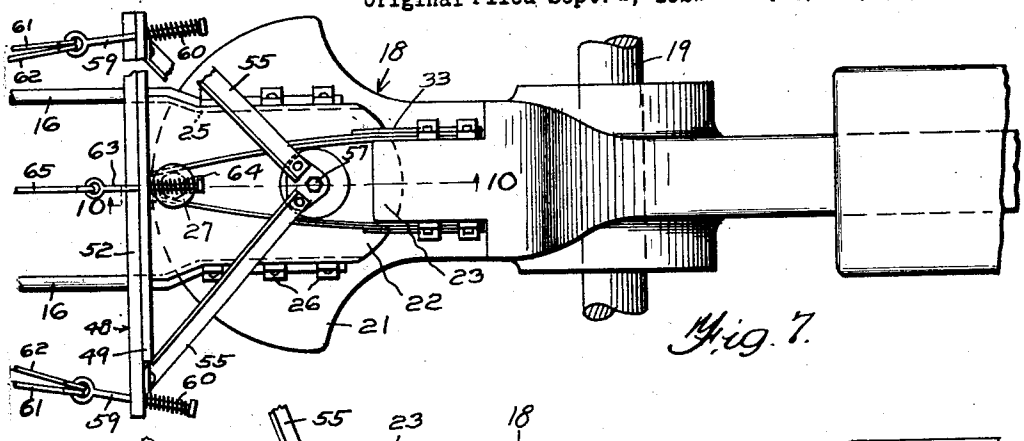


Fig. 7.

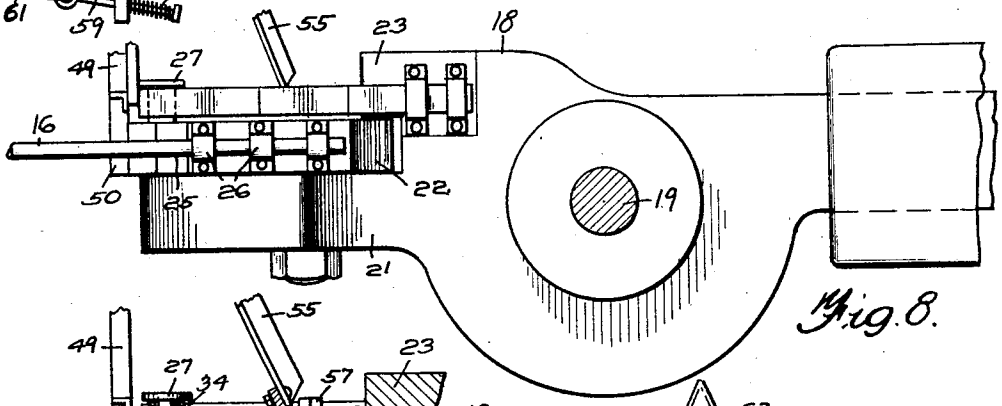


Fig. 8.

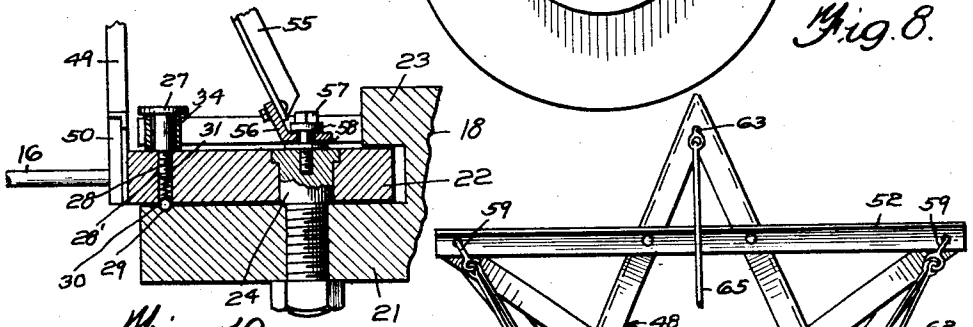


Fig. 10.

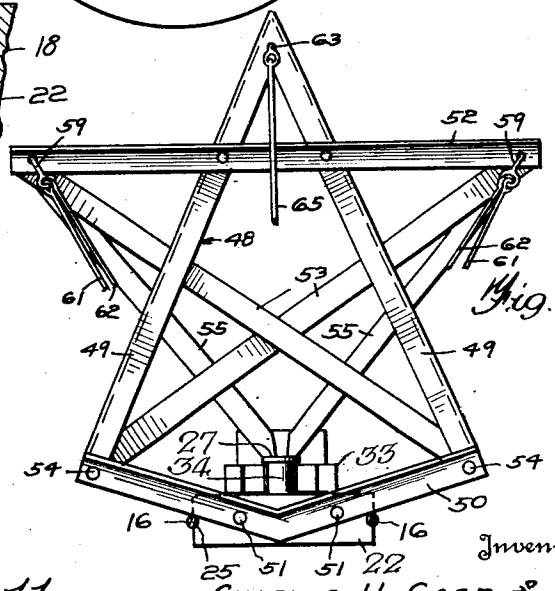


Fig. 9.

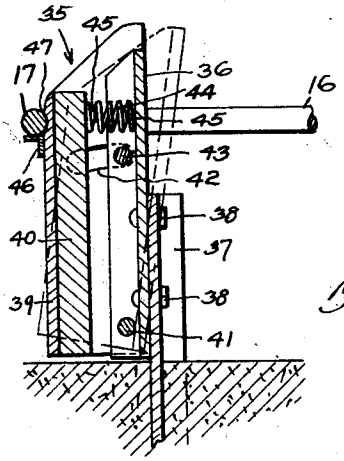


Fig. 11.

Inventor

CHARLES H. GAGE AND

ARTHUR E. SEARLES.

By P. P. Thompson

Attorney

Patented Apr. 16, 1929. 1,709,344

UNITED STATES PATENT OFFICE.

CHARLES H. GAGE AND ARTHUR E. SEARLES, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNORS TO LINN W. SEARLES, OF CHEVY CHASE, MARYLAND, WILLIAM D. RITER, OF WASHINGTON, DISTRICT OF COLUMBIA, AND WILLIAM A. FAISON, OF CHESTER, PENNSYLVANIA, TRUSTEES OF AUTOMATIC CAR COUPLER TRUST.

RAILWAY GATE.

Application filed September 2, 1926, Serial No. 133,152. Renewed March 30, 1928.

My invention relates to improvements in railway gates adapted for use at highway crossings.

An important object of the invention is to provide a gate of the above mentioned character, so constructed that it will offer a proper resistance to the travel of an automobile or the like, when the automobile runs into the same while the gate is closed, thus arresting the travel of the automobile.

A further object of the invention is to provide a gate of the above mentioned character, which will arrest the travel of the automobile or the like, under ordinary conditions, and which is sufficiently yieldable and flexible to prevent undue injury to the automobile or to the gate.

A further object of the invention is to provide means whereby the major longitudinal portions of the gate are automatically returned to their normal positions, after engagement with a traveling automobile or the like.

A further object of the invention is to provide means whereby the vertically swinging gate may also partake of horizontal swinging movement, in the event that it should be engaged by a traveling automobile or the like, before it is held or locked in the lowermost position.

A further object of the invention is to provide means for returning the gate to the normal position, and for holding the same in such position, when shifted horizontally in either direction from the normal position.

A further object of the invention is to provide a snubbing post which is yieldable in the direction of the longitudinal axis of the gate, whereby a limited amount of flexibility is imparted to the gate, when engaging therewith.

A further object of the invention is to provide suitable means for imparting to the gate suitable rigidity against sagging action.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings, forming a part of this specification and in which like numerals are employed to designate like parts throughout the same,

Figure 1 is a plan view of a railway highway crossing gate embodying my invention,

Figure 2 is a side elevation of the same,

Figure 3 is an enlarged plan view of the gate, parts broken away,

Figure 4 is a fragmentary plan view of the rods embodied in the gate, and associated elements, indicating the manner of flexing one of the rods,

Figure 5 is a transverse section taken on line 5—5 of Figure 3,

Figure 6 is a similar view taken on line 6—6 of Figure 3,

Figure 7 is a plan view of the pivoted end of the gate, showing the supporting means therefor,

Figure 8 is a side elevation of the same,

Figure 9 is a transverse section taken on line 9—9 of Figure 3,

Figure 10 is a longitudinal section taken on line 10—10 of Figure 7, and,

Figure 11 is a vertical section taken on line 11—11 of Figure 3.

In the drawings, wherein for the purpose of illustration, is shown a preferred embodiment of our invention, the numeral 15 designates a body portion of the gate, which is preferably formed of an integral or continuous metal rod, bent upon itself between its ends, into a generally U-shaped form. This rod thus bent provides a pair of main side rods 16, connected at their free ends by a loop 17. The metal rod 15 is preferably formed of piano wire steel.

The numeral 18 designates a vertically swinging support or block, arranged at the opposite end of the body portion 15. This support or block is rigidly mounted upon a horizontal rock-shaft 19, journaled in stationary bearings 20. The shaft 19 may be turned by any suitable means, for raising and lowering the gate. The shaft may be manually turned or power operated, and the operation of the shaft may be automatically controlled by the approach of a train or the like. The support 18 is provided at its forward end with a flat extension 21, upon which is arranged a horizontally swinging block 22, having its rear end projecting under a shoulder 23. The block 22 is pivoted to the extension 21 by

means of a pin 24. The rear ends of the rods 16 extend within grooves 25 formed in the sides of the block 22, and are held there by straps 26 or any other suitable means.

The numeral 27 designates a shifting pin, having a reduced screw-threaded end 28, engaging in a screw-threaded opening 28′ formed in the forward end of the horizontally swinging block 22. This opening extends through the bottom of the block 22 and is adapted to be brought into registration with a depression 29, formed in the top face of the extension 21, when the block 22 is in the normal or central longitudinal position. A ball-catch 30, is carried in the lower end of the opening 28′ and is forced downwardly by a spring 31 and is adapted to enter the depression 29.

Rigidly secured to the opposite edges of the overhanging portion 23 of the support 18, is a pair of leaf-springs 33, which extend longitudinally of the support in a forwardly direction and have their free ends engaging the opposite sides of a roller-sleeve 34, rotatably mounted upon the pin 27. It might be stated at this point that ordinarily, the ball-catch 30 fitting within the recess 29, will retain the body portion 15 of the gate in the normal position, in alinement with the swinging support 18. This swinging support turns vertically with the shaft 19. However, should the body portion of the gate be struck a blow by a traveling vehicle before its free end is locked against lateral movement, by means to be described, such body portion will then be capable of turning horizontally upon the pivot 24. This will prevent undue injury or destruction of the gate. After the body portion of the gate is free from engagement with the vehicle, the spring or springs 33 will return the body portion of the gate to the normal position, and the ball-catch 30 will enter the depression 29, and again lock the block 22 to the extension 21.

The numeral 35 designates a snubbing post as a whole embodying an inner stationary vertical channel-iron 36, Figures 1, 2, 3 and 11, which is rigidly attached to the upstanding arm of a generally U-shaped anchor channel-iron 37, which is preferably embedded in concrete or the like at a point suitably near the crossing and extending under the roadway. This connection is effected by means of bolts 38 or the like. It is preferred that these bolts be sufficiently strong to withstand all ordinary strains or shocks to which the gate is expected to be subjected, but in the event that the gate should be subjected to unusual shocks or strains the bolts 38 will break thereby releasing the channel-iron 36. Of course, the invention is in no sense restricted to this precise arrangement as the connection may be strengthened if desired. Arranged upon the outer side of the vertical channel-iron 36 is a shield or housing 39, which is generally U-shaped in horizontal cross section. A block 40 is arranged within this shield and is rigidly secured thereto by any suitable means. At its lower end, the shield or housing 39 is pivoted to the vertical channel-iron 36 by means of a transverse pin 41. The shield 39 is provided in its sides, and near its upper end, with curved slots 42, concentric with the pin 41, and receiving the ends of a transverse pin 43, carried by the channel-iron 36. A plurality of compressible coil springs 44 are arranged within the upper end of the shield 39, and are disposed between the block 40 and the channel-iron 36. These springs are held in place by trunnions 45 extending into the ends thereof and these trunnions are carried by the channel-iron 36 and block 40. The invention is in no sense restricted to the number of springs shown, as this number may be increased or decreased, depending upon the strength of the springs or the amount of resistance required.

The U-shaped portion 17 of the gate is arranged to pass downwardly over the snubbing post 35 and its downward movement is limited by contact with a stop 46, Figure 11, which may be in the form of an angle-iron or the like, rigidly attached to the shield 39 or formed integral therewith. Above this stop, the shield 39 is provided with a recess 47, for the reception of the U-shaped portion 17. The purpose of this recess is to prevent the gate from slipping upwardly off of the snubbing post, when the shield swings inwardly, in the direction longitudinally of the gate.

The generally U-shaped anchor channel-iron 37 has one end attached to the channel-iron 36, as explained, while its opposite upstanding end is preferably rigidly attached to the bearing 20, as shown.

We provide means for supporting the body portion of the gate against sagging action, such means including an upstanding frame 48. This frame includes a pair of upwardly converging bars 49 see more particularly Figure 9. These bars are rigidly attached at their lower ends to a generally V-shaped bar 50, which is arranged upon the forward end of the block 22, projecting downwardly between the rods 16, and bolted to the forward end of the block, as shown at 51. A horizontal bar 52 is rigidly attached to the upper ends of the bars 49 and is secured at its ends to diagonal bars 53, which cross, and extend downwardly and are attached to the ends of the bars 49 and the bar 50, as shown at 54. Rigidly attached to the ends of the bar 52 and the diagonal bars 53, by riveting, welding or the like, are brace bars 55, which converge rearwardly and are connected at their ends with a coupling plate 56, which is pivoted upon a bolt 57, attached to the pin 24. Washers 58 are preferably arranged above and below the coupling plate 56.

The horizontal bar 52 is provided at its

ends with openings for slidably receiving eye-bolts 59, the rear ends of which carry suitably stiff compressible coil springs 60. Attached to the forward ends of these eye-bolts are pairs of diagonal guy wires 61 and 62. At their upper connected ends, the bars 49 are provided with an opening for slidably receiving an eye-bolt 63, carrying at its rear end a suitably stiff compressible coil spring 64. Attached to the forward end of this eye-bolt 63 are longitudinal guy wires 64′ and 65.

The numeral 66 designates a cam yoke which is provided with longitudinal openings 67 to receive the side rods 16. This cam yoke is provided upon its rear side with cam faces 68, arranged to engage collars 69, which are adapted to be clamped to the side rods, in adjustment, by bolts 70 or the like. Pivoted upon the central portion of the cam yoke is a coupling plate 71, having outer openings 72, for connecting with the inner diagonal guy wires 62 and an inner opening 73 for connection with the inner longitudinal wire 64′.

The numeral 74 designates a transverse spacing bar, the ends of which are provided with recesses 75, for the reception of the side rods 16. The ends of this spacing bar engage collars 76, which are adapted to be clamped in adjustment to the side rods 16 by means of bolts 77, or the like. Pivoted or otherwise connected with this spacing bar 74, at its center, as shown at 78, is a coupling plate 79, having outer openings 80, for connection with the outer diagonal guy wires 61, and an inner opening 81, for connection with the outer longitudinal guy wire 65. The function of the transverse spacing bar 74 is to afford a connection between these guy wires and the side rods 16, and also to retain the side rods suitably spaced, whereby they will properly fit over the snubbing post.

The operation of the apparatus is as follows:

When it is desired to prevent an automobile passing over a railway track, the gate is moved to the lowermost position and is substantially horizontal, as shown in Figures 1 and 2, thereby closing the highway. Ordinarily two gates will be employed at each highway crossing. As clearly shown in Figure 11, the U-shaped portion 17 of the gate will rest upon the stop 46 and be within or adjacent to the recess or depression 47. Should an automobile approaching a railway crossing, when the gate is closed, fail to stop and drive into the central portion of the gate, the gate would then function to arrest the movement of the automobile by increasingly applied resistance to the travel of the automobile. When the traveling automobile contacts with the side rod 16 of the gate, near the center of the gate, the general action is to flex the gate laterally. This lateral flexing of the gate will cause the same to pull upon the snubbing post, causing the shield 39 to swing upon its pivot in a direction parallel with the normal longitudinal axis of the gate. This action, of course, compresses the springs 44 and these springs apply an increasing resistance to the flexing of the gate, which in turn is transmitted to the automobile. When the automobile first engages one side rod 16 the action is to flex this individual rod forwardly, as shown in Figure 4 and the cam saddle 66 is also shifted laterally toward the opposite side rod. This individual flexing of one rod will occur before any perceptible compressing of the springs 44 takes place and affords the initial resistance to the travel of the car. The further travel of the car tends to flex both side rods 16 forwardly and this action causes the compression of the springs 44 which provides a further and increasing resistance to the travel of the car. Unless the car should be traveling at an excessive rate of speed, it will be found that the gate will bring the car to a stop, without undue injury to the car or to the gate. When the car is removed from contact with the gate, the springs 60 and 63 pulling upon the guy wires 61 and 62 tend to shift the cam yoke 66 rearwardly upon the side rods 16. This action of the cam yoke causes the collars 69 to travel outwardly upon the cam faces 68 and hence the side rods 16 will be returned to the outer or normal positions.

If the gate is partly lowered so that it can be struck by an approaching automobile but is not sufficiently lowered so that it has proper locking engagement with the snubbing post then when the gate is struck by such automobile it will swing horizontally upon its pivot 24 and permit of the passage of the car, without undue injury, or destruction to the gate. This action would be desirable where the gate is approaching its lowered or raised position but has not sufficiently completed the same to lock the gate in the closed position or to clear the highway.

While it is preferred to use the yielding snubbing post in connection with the gate, yet the invention is in no sense restricted to the use of the snubbing post, as under certain conditions the snubbing post may be omitted and the gate used without it.

It is to be understood that the form of our invention, herewith shown and described is to be taken as a preferred example of the same, and that various changes in the shape, size and arrangement of parts may be resorted to without departing from the spirit of our invention or the scope of the subjoined claims.

Having thus described our invention, we claim:—

1. A railway highway crossing gate, comprising a body portion provided with a loop, a support for the gate so that it may be raised and lowered, and a snubbing post arranged to be received within the loop when the body portion is lowered, said snubbing

post having a part movable longitudinally of the longitudinal axis of the gate, and yielding means to oppose such movement of the part.

2. A railway highway crossing gate, comprising a body portion having a loop, a support for the gate so that it may be raised and lowered, a post, a member connected with the post and movable with relation thereto, and resilient means to oppose such movement of the member, said member being adapted to be received within the loop when the body portion is lowered.

3. A railway highway crossing gate, comprising a body portion having a loop, a support for the gate so that it may be raised and lowered, a stationary post, a shield pivoted to the stationary post, and resilient means arranged between the shield and the post, said shield being adapted to be received within the loop when the body portion is lowered.

4. A railway highway crossing gate, comprising a body portion having a loop, a support for the gate so that it may be raised and lowered, and a snubbing post arranged to enter the loop when the body portion is lowered, said snubbing post being rigid in a direction longitudinally of the road and resilient within limits in a direction transversely of the road.

5. A railway highway crossing gate, comprising a body portion including a pair of spaced members provided near their ends with a loop, means for supporting the body portion so that it may be raised and lowered, said members being attached to the supporting means so that they are incapable of moving longitudinally with relation thereto, a snubbing post arranged to enter the loop when the body portion is lowered, and resilient means engaging the members between their ends to oppose the lateral flexing of either of or both members in a direction generally at a right angle to the raising and lowering movement of the body portion.

6. A railway highway crossing gate, comprising a body portion including a pair of spaced members provided with a loop, means for supporting the body portion so that it may be raised and lowered, a snubbing post arranged to enter the loop when the body portion is lowered, stops mounted upon the members, a cam saddle carried by the members and having cam faces to engage the stops and so arranged that the cam saddle is adapted to be shifted longitudinlly of said members when either of or both members are laterally flexed, and resilient means to oppose the movement of the cam saddle longitudinally of the members.

7. A movable gate to be raised and lowered comprising, a body portion having end portions and embodying a pair of spaced rods, means carried by the gate and adapted to exert an increasing resilient action against the lateral flexing of either of or both rods, and a separate holding device for engagement with one end portion of the body portion and adapted to exert an increasing resilient action against the further lateral flexing of the rod or rods.

8. A movable gate to be raised and lowered comprising, a body portion having ends and embodying a pair of spaced flexible elements, means carried by the gate and adapted to exert an increasing resilient action against the lateral flexing of either of or both elements, and a separate holding device for detachable engagement with one end of said body portion, said holding device embodying a resilient part adapted to exert an increasing resilient action against the lateral flexing of the element or elements.

9. A movable gate to be raised and lowered, comprising a body portion including a one-piece element bent upon itself into a generally U-shaped form affording spaced arms, and means engaging the intermediate portions of said arms to exert an increasing resilient action against the lateral flexing of either of or both arms.

10. A railway highway crossing gate, comprising a body portion including a pair of spaced longitudinal members, means for supporting the body portion so that it may be raised and lowered, stops mounted upon the longitudinal members, a cam saddle carried by the members and having cam faces to engage the stops and so arranged that the cam saddle is adapted to be shifted longitudinally of said members when either of or both members are laterally flexed, and resilient means to oppose the movement of the cam saddle longitudinally of the members.

11. A railway highway crossing gate, comprising a body portion including a pair of spaced longitudinal members which are adapted to be flexed laterally, means for supporting the body portion so that it may be raised and lowered, a member extending transversely of the longitudinal members and having cam faces, parts carried by the longitudinal members to slidably engage the cam faces, and resilient means to oppose the movement of the transverse member longitudinally of the longitudinal members.

12. In a movable gate, a vertically swinging support, a gate element pivoted upon the support to swing laterally at substantially a right angle to the direction of movement of the support, said gate element having an opening near its free end resilient means to oppose the lateral swinging movement of the gate element, a releasable latch for holding the gate element in the normal position in alinement with the vertically swinging support, and a snubbing element to be received within the opening when the gate element is lowered.

13. A railway highway crossing gate, comprising a body portion including a pair of resilient rods having stops mounted thereon, means for supporting the body portion so that it may be raised and lowered, a transverse cam saddle having elongated openings for receiving the rods and provided with cam faces arranged to contact with said stops, and resilient means to oppose the movement of the cam saddle longitudinally of the rods.

14. A movable gate to be raised and lowered comprising a body portion including a pair of spaced resilient rods, means for raising and lowering the body portion, and means slidably engaging the resilient rods in their intermediate portions and adapted to exert a yielding action to oppose the lateral flexing of the rods.

15. A movable gate comprising a body portion including a resilient rod, a member mounted upon the rod and having a transversely arranged cam face, a part carried by the rod and engaging the cam face, and means to oppose the movement of the member longitudinally of the rod due to the action of the part and cam face upon the lateral flexing of the rod.

16. In a movable gate, a support, a block pivoted upon the support to swing horizontally with relation thereto, a gate body attached to the block for movement therewith, a pin mounted upon the block in advance of the pivot element, and a pair of spring arms attached to the support and engaging upon opposite sides of the pin.

17. In a movable gate, a support, a block mounted thereon, a pivot element connecting the block with the support so that the block may swing horizontally with relation thereto, a gate body mounted upon the block to move therewith, a truss structure mounted upon the block and having a part secured to the pivot element, connecting means between the truss structure and the gate body, a pin mounted upon the block in advance of the pivot element, and spring arms mounted upon the support and engaging opposite sides of the pin.

18. In a movable gate, a vertically swinging support embodying a lower portion and an overhanging shoulder, a block mounted upon the lower portion with its rear end extending under the overhanging shoulder, a pivot element connecting the block and lower portion, a pin secured to the block in advance of the pivot element, spring arms attached to the sides of the overhanging shoulder and engaging opposite sides of said pin and a gate body carried by said block.

19. A movable gate, comprising a body portion including a resilient longitudinal member, and means engaging the intermediate portion of the member to oppose its lateral flexing, said means including a plurality of members having relative sliding wedging engagement with each other.

20. A railway highway crossing gate comprising a substantially rigid support, a resilient body portion pivoted near one end to said support, a tensioning device, and means for detachably interlocking the free end of said resilient body portion with said tensioning device when the body portion is in the lowered position, said tensioning device allowing said free end to move under heavy impact and returning the same to the original position after the pressure is removed from said body portion.

21. A railway highway crossing gate, comprising a substantially rigid support, a resilient body portion pivoted near one end to said support, a resilient snubbing device, and means whereby the free end of the resilient body portion is detachably interlocked with said snubbing device when the body portion is in the lowered position, said snubbing device allowing said free end to move under heavy impact and returning the same to the original position when the pressure is removed.

22. A railway highway crossing gate, comprising a substantially rigid support, a resilient body portion including a pair of rods having a loop near their free ends, said resilient body portion being pivoted near its opposite end to said support, and a yielding snubbing device, having a part for inserting within said loop when the free end of said body portion is in the lowered position, said yielding snubbing device allowing said free end to move under heavy impact and returning the same to the original position when the pressure is removed.

23. A movable gate to be raised and lowered, comprising a body portion including a pair of spaced resilient rods, means for raising and lowering the body portion, a transverse member engaging the intermediate portions of the rods, an upstanding supporting structure connected with said body portion, connecting elements between the upstanding supporting structure and the transverse member, and yielding means to oppose the movement of the connecting elements in one direction.

24. A movable gate to be raised and lowered, comprising a body portion including a pair of spaced resilient rods, means for raising and lowering the body portion, a transverse member engaging the intermediate portions of the rods, an upstanding supporting structure connected with said body portion, and connecting elements between the upstanding supporting structure and the transverse member.

25. In a movable gate, a vertically swinging support, a gate element pivoted upon the support to swing laterally with relation to

the support, resilient means to oppose the lateral swinging movement of the gate element, a spring pressed rolling element connected with the gate element and arranged to engage the vertically swinging support and tending to hold the gate element in the normal position in substantial alinement with said support, a snubbing device, and means whereby the gate element has detachable engagement with the snubbing device.

In testimony whereof we affix our signatures.

CHARLES H. GAGE.
ARTHUR E. SEARLES.