

(No Model.)

5 Sheets—Sheet 1.

A. BARRÉ & E. CURRIER.
RAILWAY GATE.

No. 523,783.

Patented July 31, 1894.

Fig. 1.

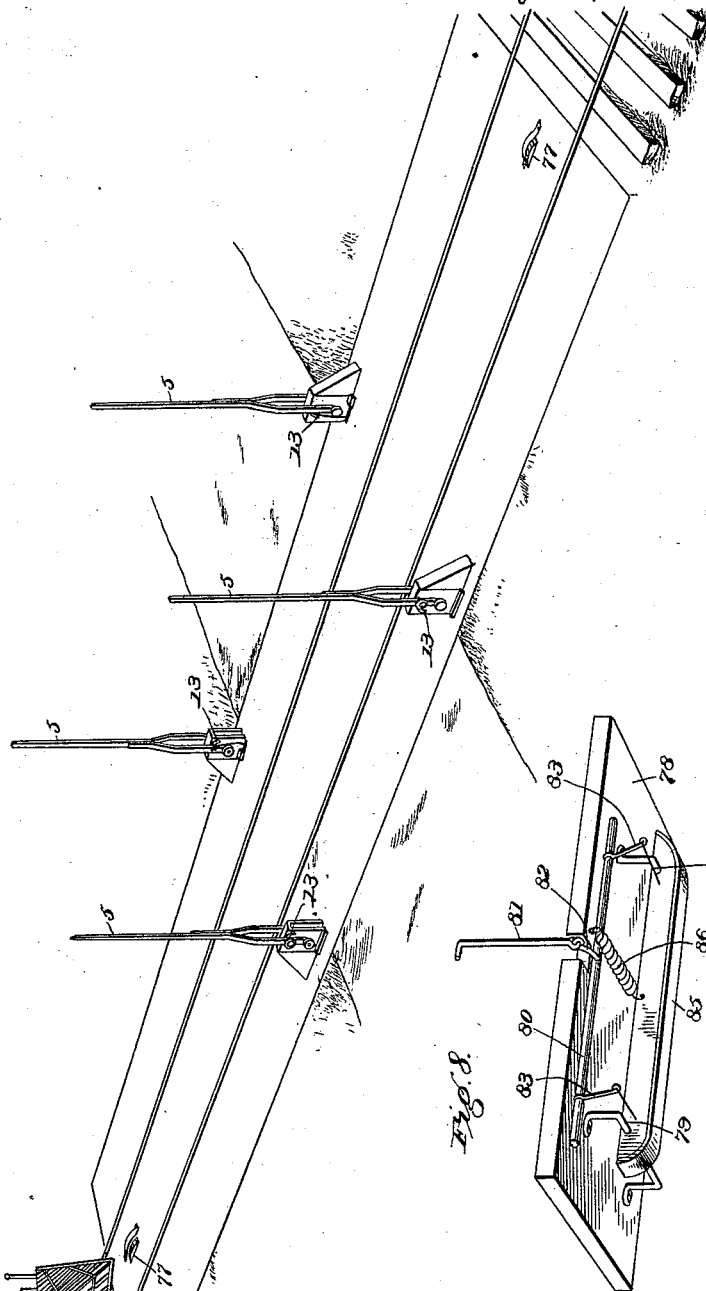
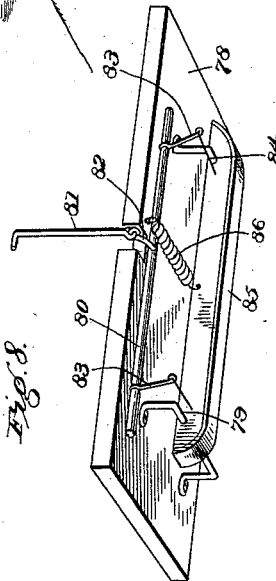


Fig. 8.



Witnesses
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W. S. Duwall

By their Attorneys.

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(No Model.)

5 Sheets—Sheet 2.

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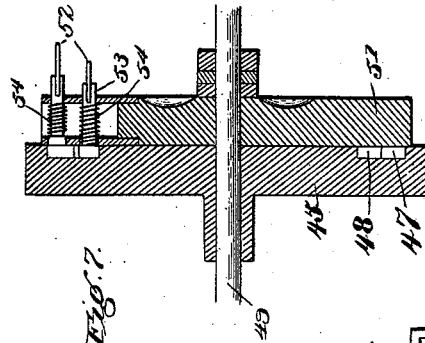
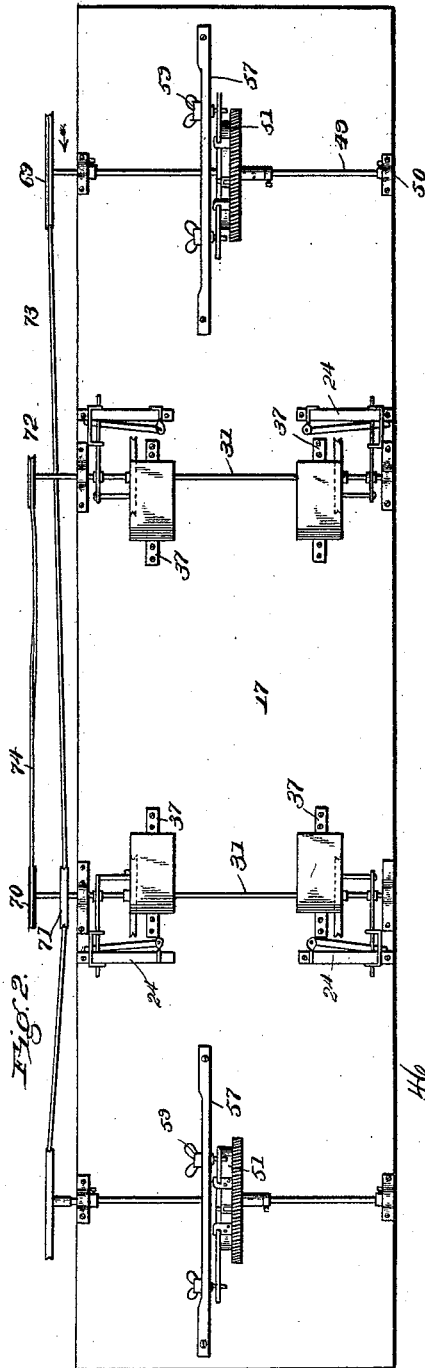


Fig. 7.

Fig. 11.

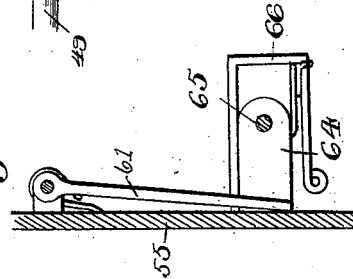
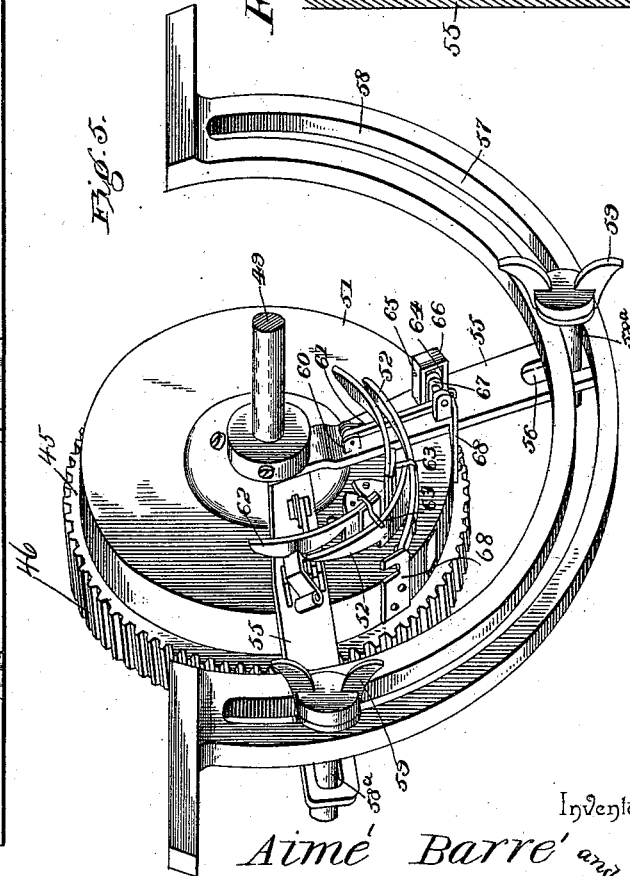


Fig. 5.



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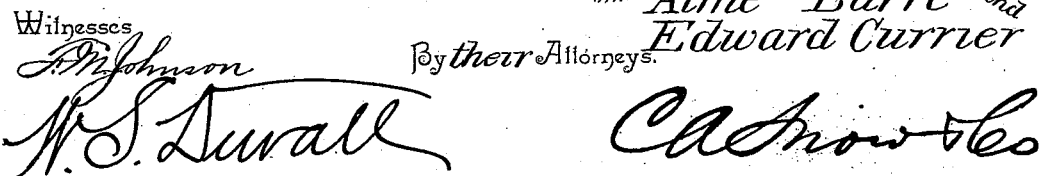
A. M. Johnson

W. S. Duwall

5 Sheets—Sheet 3.

RAILWAY GATE.

Patented July 31, 1894.



(No Model.)

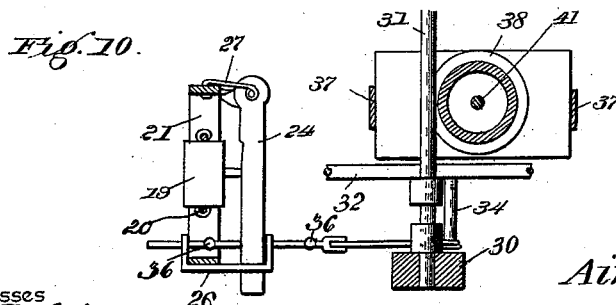
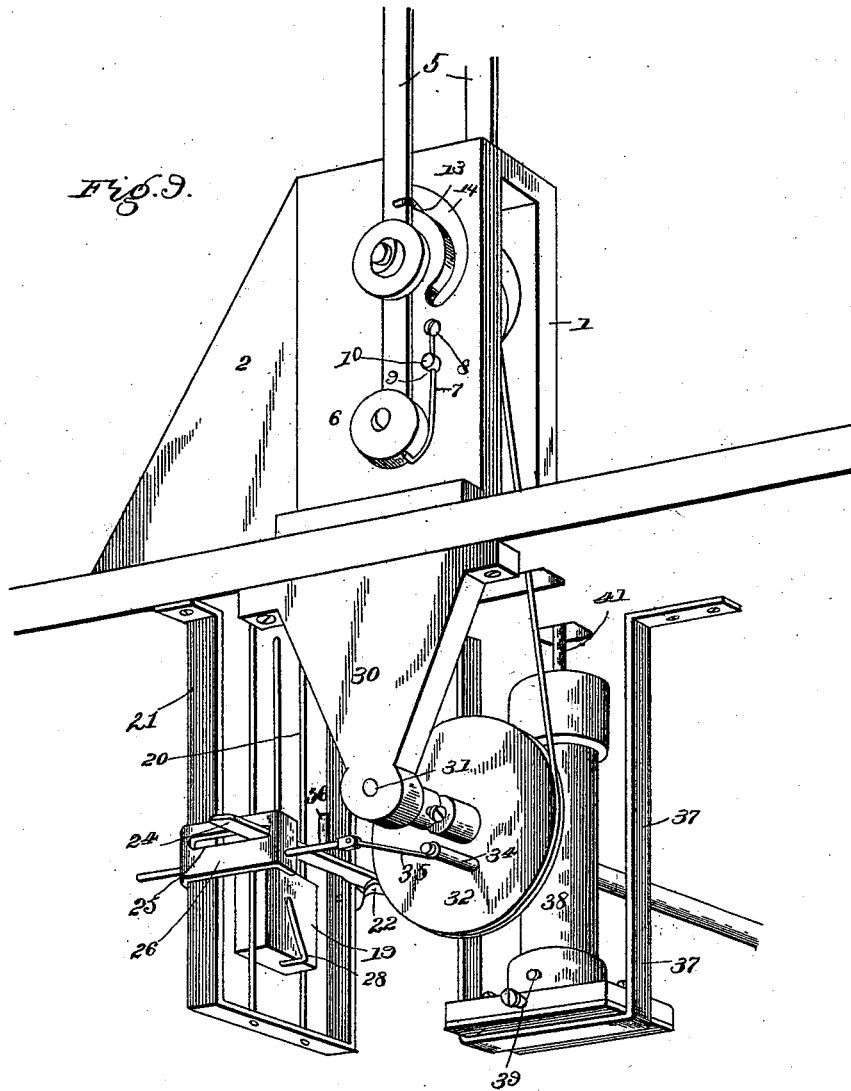
5 Sheets—Sheet 4.

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RAILWAY GATE:

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Fig. 12.

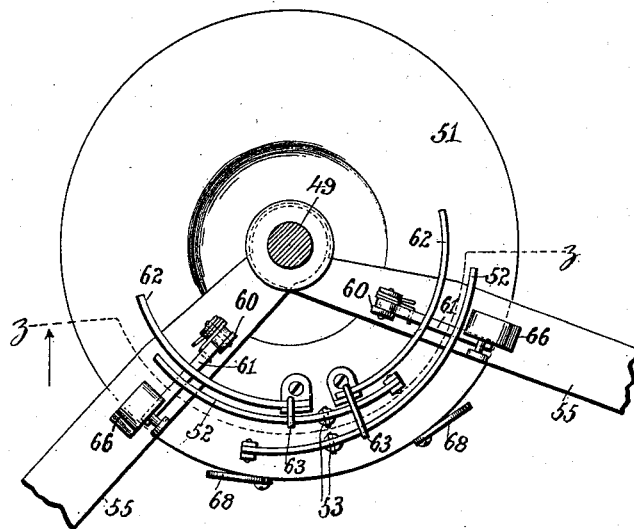


Fig. 13.

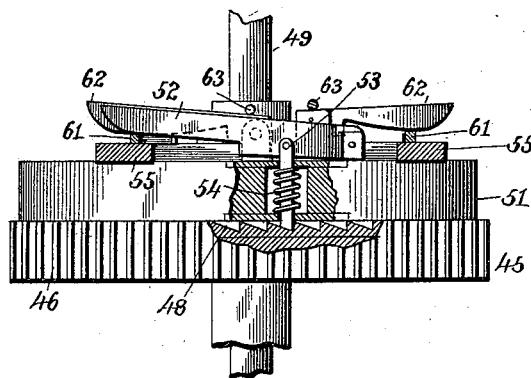


Fig. 14.

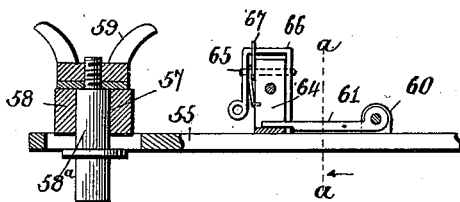
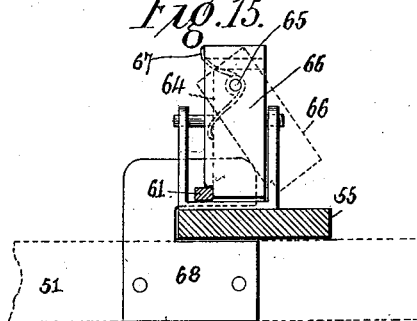


Fig. 15.



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UNITED STATES PATENT OFFICE.

AIMÉ BARRÉ AND EDWARD CURRIER, OF FALL RIVER, MASSACHUSETTS.

RAILWAY-GATE.

SPECIFICATION forming part of Letters Patent No. 523,783, dated July 31, 1894.

Application filed October 16, 1893. Serial No. 488,316. (No model.)

To all whom it may concern:

Be it known that we, AIMÉ BARRÉ and EDWARD CURRIER, citizens of the United States, residing at Fall River, in the county of Bristol and State of Massachusetts, have invented a new and useful Railway-Gate, of which the following is a specification.

Our invention relates to railway gates, and has special reference to certain new and useful improvements upon the construction disclosed in United States Patent No. 493,577, granted E. Currier March 14, 1893.

The objects of our present invention are to simplify the construction of the mechanism as a whole; to increase its efficiency and adapt the same to operate positively and smoothly.

Various other objects and advantages of the invention will appear in the following description and the novel features thereof will be particularly pointed out in the claims.

Referring to the drawings:—Figure 1 is a perspective view of a railway crossing, the same being provided with gates arranged in accordance with our invention and illustrating a locomotive thereon in the act of operating the mechanism. Fig. 2 is a bottom plan view of the mechanism. Fig. 3 is a vertical longitudinal sectional view through one of the gate supports. Fig. 4 is a transverse sectional view through the same. Fig. 5 is a detail in perspective of one of the drums employed for operating the gates. Fig. 6 is a view of the drum and disk, the same being separated. Fig. 7 is a transverse sectional view through one of the drums and its disk. Fig. 8 is a detail in perspective of the operating shoe carried by the locomotive. Fig. 9 is a detail in perspective of the mechanism below one of the mast-arms. Fig. 10 is a horizontal sectional view through the mechanism below a mast-arm. Fig. 11 is a detail hereinafter referred to. Fig. 12 is a detail plan view of one of the drums for operating the gates. Fig. 13 is a detail elevation or edge view of the construction shown in Fig. 12, with a section taken on the line $z-z$. Fig. 14 is a detail elevation partly in section of one of the adjusting arms carrying the U-shaped catches. Fig. 15 is a detail sectional view on the line $a-a$ of Fig. 14. Fig. 16 is a detail plan view of the adjacent pulleys that are located in the hollow mast standards, said pulleys being

shown slightly separated to illustrate the engagement of the pins carried thereby.

Like numerals of reference indicate like parts in all the figures of the drawings.

In carrying out our invention we employ at opposite sides of the track and of the crossing the usual mast-standards 1, which are of inverted U-shape in vertical section and have arranged at their outer sides hoods 2 for covering certain mechanism hereinafter described. Each of the standards 1 has located transversely therein a shaft 3 whose ends extend beyond the sides of the standard and through perforations formed in the bifurcated portion of the mast 5. These masts are of the usual construction, and each pair is designed to constitute a gate and to be swung toward each other by mechanism hereinafter described. The masts are weighted at their outer ends as indicated at 6 in order to counterbalance the weights of the masts at the opposite sides of their fulcrum. Depending springs 7 are secured at their upper ends to studs 8 at the outer side of each standard and pass through perforations 9 formed in studs 10 arranged below the studs 8. These springs constitute buffer-arms against which the weights may strike when the masts are elevated.

In each standard there are loosely mounted upon the transverse shaft 3 a large and a small grooved pulley 11 and 12 respectively, and secured to the large pulley and extending laterally therefrom is a yoke-bar 13, which has its ends passed through curved slots 14 formed in the side walls of the standard 1 concentric with the shaft and beyond said slots bent to engage with the bifurcations of the mast. A rope or cable 15 is made fast to the large pulley and extends rearward under the hood 2 down through a perforation 16 formed in the base 17 over guide-pulleys 18 located above said perforation and is connected to the upper end of a vertically movable weight 19. This weight 19 is vertically bored or grooved at its sides and designed for movement upon vertical guide-rods 20, which rods are arranged parallel in a depending U-shaped frame 21 that extends from the base 17. A bracket-arm 22 projects from one side of this U-shaped frame, and upon the same is pivoted by a bolt 23 a

horizontally movable latch 24, whose opposite free end passes through a slot 25 formed in a corresponding bracket arm 26 at the opposite side of the frame. A spring 27 is connected with the latch and serves to draw the same inwardly into the path of a beveled shoulder or catch 28 which is located at the front side of the aforesaid weight 19. A pair of hangers 30 are located at the under side of the base 17 and provide journals for a transverse shaft 31 upon which is mounted a grooved pulley 32. This grooved pulley 32 is by means of an endless belt 33 engaged with the smaller pulley 12 before mentioned so that any movement upon the part of either pulley is communicated to the other.

A wrist-pin 34 extends from the pulley 32 and has connected to it a releasing rod 35. This extends through the bracket 26 which is perforated for its reception below the free end of the latch and is provided at each side of the latch with stops 36, the front stop being designed to abut against the front end of the bracket 26 and the rear stop against the latch 24, and thus withdraw the same from under the catch 28 of the weight 19 and permit the latter to descend.

In a U-shaped frame 37 at the side of and below each standard 1 there is supported a pneumatic cylinder 38 which is provided at its lower end with a vent 39 that may be regulated in an obvious manner to increase or diminish the escape of air therefrom. A weighted piston head 40 is located in the cylinder, and from the upper side of the same there extends a piston-rod 41 which projects through the upper end or head of the cylinder through a perforation in the base 17 and is loosely connected by a pin 42 to the lower end of a connecting rod 43 attached at its upper end to a wrist-pin 44 that extends from the inner bifurcation of the mast. This completes the construction of one of the standards, its mast, and operating mechanism, and it will be understood that each of the remaining standards is but a duplication and hence requires no specific description.

Beyond the pairs of masts and standards and located between the rails of the track are the trip-drums and their auxiliary mechanisms. The trip-drum 45 has its periphery provided with a series of teeth 46, and into its inner face are let rings 47 and 48 which are concentric but are provided with inclined ratchet-teeth disposed in reverse directions. Each drum is mounted upon a transverse shaft 49 located in depending bearings 50 supported from the base 17 of the mechanism. At the toothed side of each drum there is arranged a disk 51. fast upon the shaft so as to move therewith. Each disk is provided with two curved pivoted latches 52, the same being reversely disposed with relation to each other and having at their front ends cam-ports, or, in other words, cut away so as to enable them to ride readily over an obstacle. From each of the latches there extends in-

ward a pawl 53, said pawls having beveled inner ends, the bevels being arranged upon them at reversesides, whereby when one pawl is in engagement with the toothed ring 47 the remaining pawl is free to glide over the inclined teeth of the ring 48, and vice versa. These pawls are normally maintained in engagement with their teeth through the medium of coiled springs 54 which surround the same and are interposed between their inner beveled ends and the wall of the disk 51.

Pairs of arms 55 are loosely mounted at their inner ends and arranged upon the shafts 49, said arms being located adjacent to the faces of the disks 51. The outer portions of these arms are provided with slots 56, which register with a curved slot 57 formed in a curved guide-bar 58 that is secured to the under side of the base 17. Through this curved slot 57 of the guide-bar binding-screws or bolts 58^a are passed, the inner ends of the same taking through the slots 56 formed in the radial arms 55 before mentioned, and thumb-nuts 59 are located upon the outer ends of the bolts or screws, whereby the aforesaid arms may be regulated or adjusted and secured at any point desired.

A pair of bearing-ears 60 is arranged upon each of the arms 55 near the shaft 49 and between each pair of bearing ears a spring-finger 61 is pivoted, the tendency of the finger being to spring outward away from the arm at its free end. These fingers lie in the paths of the latches 52 and are designed to be overridden and compressed by a pair of cam-arms 62, which are disposed in opposite directions and secured to the face of the disk 51 between the center thereof and the cam-latches and said cam arms 62, are provided in their inner edges with notches, as clearly illustrated in Figs. 5 and 13 of the drawings, and the notches in said arms are adapted to receive the fingers 61, when they spring up, so that such fingers may move against the latches 52 to disengage the pawls carried thereby. Stop-arms 63 project from the cam-arms and overlap the latches to limit the upward movements of the latter.

Posts 64 are located upon the arms 55, and upon each post is pivoted by its pin 65 a U-shaped catch 66 whose inner end is normally spring-pressed by a spring 67 above the spring-finger 61, and whose outer end is arranged in the path of a pair of notched releasing-fingers 68 secured to the periphery of the disk between the arms 55. Upon the outer end of each of the shafts 49 a grooved pulley 69 is located. Shafts 31 like the shafts 49 project beyond their bearings at one side, and one of said shafts is provided with a pair of grooved pulleys 70 and 71 while the other is provided with a single pulley 72. A cable 73 is secured to the pulleys 69 and extends from the upper sides thereof over the pulley 71 and a cross-belt 74 connects the pulleys 70 and 72. Thus it will be seen that a rotary motion upon the part of one of the pulleys 69

will be reversed as regards the pulleys 71 and 70, and the shaft 31 upon which they are mounted, which motion will be again reversed and transmitted to the companion shaft 31, so that the shafts will be rotated toward each other. Such rotation upon the part of the shafts 31 causes the grooved pulleys 32 of said shafts to rotate, and through the medium of their endless belts 33 motion is transmitted to the pulleys 12 connected therewith. Pins arranged on the inner side of the pulleys 12 and designated as 75 engage with corresponding pins 76 formed on the inner faces of the adjacent larger pulleys 11, so that the latter are revolved with the former and hence carry with them the transverse yoke-bars 13 which are thus drawn from under the bifurcated portions of the mast leaving them free to be influenced by the weighted pistons 40, which begin to descend forcing the air under the same from the cylinders through the vents 39. The rapidity of the weighted piston it will be observed will be regulated by the vents 39. At the same time that the pistons descend the masts swing downward and the pulleys in the mast standards on opposite sides of the road or highway rotate forward or toward each other it will be seen that the ropes or cables 15 will be drawn up together with the weights 19, so that the catches 28 of the weights will ride against the latches, 24 forcing the same outward against the tension of their springs. When the weights arrive above the latches and the latter are no longer influenced by the catches, the springs throw the latches back under the catches and thus aid in the support of the weights. This movement of the mechanism is caused by a rotation of the toothed drum 46 at either end of the mechanism, it being understood that the peripheries of these drums extend through openings 77 formed in the base 17 between the rails of the track, and are in position to be struck by friction-shoes arranged under the locomotive. A train coming in the direction illustrated in Fig. 1 will operate upon the drum so as to cause the same together with its disk to rotate in the direction of the moving train, one of the spring-pawls 53 riding loosely over the teeth with which it engages and the remaining pawl engaging with the teeth and causing the disk and drum to move together in the manner specified. In this manner the releasing-finger 68 is caused to abut against the U-shaped latch 66 and swing the same so that the inner end of the latter will be drawn from over the outwardly spring-pressed finger 61, and the latter being liberated strikes against the latch, whose pawl is in operative engagement with the teeth of the ratchet and withdraws the same so that the momentum given the drum will continue to rotate the same without breaking the parts or operating the mechanism further. When the train reaches the opposite drum this operation will be reversed and the shafts 31 operated so as to cause the releasing rods car-

ried by the disks or pulleys 32 thereof to withdraw the latches 24 from under the weights 19, and they being liberated will descend along their guides, thus rotating the pulleys 12, which withdraws their pins from engagement with the pins of the pulleys 11, permitting the latter to be operated through the medium of the descending weights 19, and by reason of their yoke-bars lifting the masts. It will be seen that the movements of the pulleys 32 will cause the liberating rods to engage with the latches 24 and withdraw the latter against the tension of their springs from under the weights 19.

Referring more particularly to the operation of the drums 45, that are mounted loosely upon the shafts 49, it is to be observed that a train coming in one direction will operate upon the drum to cause the same together with its disk to rotate in the direction of the moving train, it having been previously observed that in this movement one of the pawls 54, rides loosely over the teeth with which it engages and the remaining pawl engages with the teeth so as to cause the disk and drum to move together. Continuing in this movement, the latch that is pivotally connected with the engaged pawl is carried over one of the spring fingers 61, which is held depressed by the adjacent cam arm 62, until one of the notched releasing fingers 68 is brought into striking contact with one end of the U-shaped catch 66, that is normally held into engagement with one end of the particular spring finger 61, referred to. Immediately upon the releasing finger 68, striking one end of the U-shaped catch 66, the latter is swung on its pivot and one end thereof is thrown out of engagement from over one end of the spring fingers 61, thereby allowing the latter to fly up into the notch of the cam arm 62, and against one end of the latch 52, connected with the engaged pawl, and this movement throws the said latch outwardly to disengage the pawl, so that the drum will be disconnected from the disk and may continue to rotate without breaking the mechanism or operating the same further. With a train coming in an opposite direction from that described, the operation just detailed will be reversed, and it is to be observed that when the cam arms 62, are carried away from over the spring fingers 61, such fingers are pressed inwardly against the tension of their springs flat onto the arms 55, so that the U-shaped catches 66, will automatically engage at one edge over the free end of the spring fingers to hold them in position for the latches 52, and the cam arms 62, to ride thereover when the disk is turned in the proper direction.

From the foregoing description, in connection with the accompanying drawings, it will be seen that we have provided a very simple, automatically operated railway-gate, which is positive and easy in its movements, and is composed of few parts.

Various designs of frictional shoes for en-

gaging with the drums may be devised, but I have illustrated the preferred form in Fig. 7, wherein 78 designates a base that is secured to the under side of the locomotive at any desired point, and to the under side of this base a pair of transverse guide-bars 79 are secured, and at one side of the latter a rock-shaft 80 which may be swung by means of a connecting-rod 81 attached to a rock-arm 82. A second rock-arm 83 projects from the rock-shaft and is by means of a connecting-rod 84 connected to a friction-shoe 85 which is transversely perforated to receive loosely the guide-rods 79 upon which said shoe is mounted. A coiled spring 86 is secured to the shoe at one side and at its opposite end to the base, so that it is normally drawn in one direction and that preferably in the plane of the operating drums. Of course by operating the rod 81 the shoe may be swung out of the path of the drums, and thus the train not operate the same.

We do not limit our invention to the precise details of construction herein shown and described, but hold that we may vary the same to any degree and extent within the knowledge of the skilled mechanic without departing from the same or sacrificing any of the advantages thereof.

Having described our invention, what we claim is—

1. The combination with a railway track, the opposite pairs of gates, the opposite drums arranged between the rails of the track and beyond the gates, of mechanism between the drums and the gates for operating the latter by movement of the former, a spring actuated shoe secured to the under side of the locomotive and adapted to come in contact with the drums and operate the same, and means for throwing the shoe into and out of alignment with the drums, substantially as specified.

2. The combination with the gates, drums arranged between the rails of the track, and mechanism between the drums operated thereby and adapted to operate the gates, of a base secured to the under side of the locomotive, transverse guide-rods arranged on the under side of the base, a friction-shoe for operating the drums arranged for transverse movement on the guide-rods, a spring for normally drawing the shoe in one direction, a rock-shaft journaled at the side of shoe, arms connected to the shaft and to the shoe, and an operating rod connected with one of the arms for oscillating the shaft and moving the shoe against the spring, substantially as specified.

3. The combination with the railway gates, the opposite transverse shafts arranged beyond the same, friction drums arranged loosely on the shafts and having catches, disks arranged at the sides of the drums and tight upon the shafts and provided with perforations, pairs of reversely disposed latches pivoted on the disks and having reversely beveled

pawls located in the perforations, springs for normally pressing the pawls through the perforations into engagement with catches on the drums, cam arms arranged upon the disks and extending beyond the latches, spring-fingers supported in the path of the latches and the cam arms and normally pressed outward, catches arranged in the path of the spring-fingers and designed to compress the same, and releasing-fingers arranged on the disks and adapted to come in contact with and operate the catches so as to liberate the fingers, of motion-conveying devices between the shafts of the disks and the gates, and means for operating the gates in the reverse direction, substantially as specified.

4. The combination with the railway gates, the opposite transverse shafts located beyond the gates, the friction-drums arranged loosely on the shafts and projecting upward between the track-rails and provided at their inner sides with reversely disposed annularly arranged ratchet-teeth, a disk at one side of each drum rigidly mounted on the shaft, arms extending from each shaft, a support for the outer ends of the arms, spring-fingers pivoted upon the arms, latches pivoted above and adapted to be normally located in the paths of the fingers and to lock the same, liberating fingers arranged on the peripheries of the disk and adapted to come in contact with the catches and liberate the spring fingers, a pair of pivoted latches arranged between the arms upon the disk and having their free ends cut away and adapted to ride over the fingers, pawls connected with the said latches and extending through the disks and normally spring-pressed into engagement with the teeth of the drum and having reversely disposed beveled faces, finger-depressing cam arms arranged upon the disk and extending beyond each of the latches, motion-conveying devices between the shafts and the gates, and means for operating the gates in the reverse direction, substantially as specified.

5. The combination with the pairs of railway gates the friction-drums beyond the same arranged between the rails, the transverse shafts for loosely supporting the drums, the disks arranged upon the shafts at the sides of the drums, reversely disposed inclined teeth arranged annularly at the sides of the drums adjacent to the disks, the curved slotted guide-bar arranged at the side of each disk, the arms mounted on the shaft of each disk and slotted at their outer ends, adjusting bolts passed through the slots of the arm and the guide-bar, the studs mounted on the arms, U-shaped catches pivoted on the studs, springs for normally actuating the same in one direction, pivoted fingers arranged in the paths of the catches, springs for normally throwing the same outward, catch-liberating fingers arranged on the periphery of the disk and adapted to engage the catches, pivoted latches arranged on the disk between the arms and reversely disposed and having outer cam ends.

for riding over the fingers, reversely beveled spring-pressed pawls arranged on the latches and extending through perforations in the disk and engaging the teeth, oppositely disposed cam arms extending beyond the latches and adapted to depress the spring-fingers and provided with stops, of motion-conveying devices between the shafts and gates for closing the gates, and means for liberating and returning the same, substantially as specified.

6. The combination with the opposite pairs of standards, transverse shafts arranged therein, a pulley arranged upon each shaft, and a mast-arm carried by each shaft of the opposite transverse shafts 49, means for operating the same, pulleys 69 on the outer ends of the shafts 49, transverse shafts 31 arranged below the gates, pulleys arranged thereon, endless belts between the pulleys of the gate-standards and those of the shafts 31, a pulley 71 carried by one of the shafts 31, the operating cable 73 connecting the pulleys 69 and passed reversely around and connected to the pulley 71, pulleys 70 on the outer ends of the shafts 31, the cross-belt 74 connecting said latter pulleys, and means for elevating the masts, substantially as specified.

7. In a railway gate, the combination with the hollow standard, the transverse shaft, the pair of pulleys arranged on the shaft, a lower transverse shaft, a pulley thereon an endless belt connecting the latter pulley with one of the upper pulleys, and means for operating said latter pulley, of a cable connected to the remaining upper pulley, a weight connected with the cable for operating the same, engaging devices between the two pulleys, a mast carried by the upper shaft, and a transverse yoke-bar carried by the weighted pulley and extending through opposite grooves in the standard and engaging the mast, substantially as specified.

8. In a railway gate, the combination with the hollow standard, the transverse shaft, the pair of pulleys arranged on the shaft, a lower transverse shaft, a pulley thereon, an endless belt connecting the latter pulley with one of the upper pulleys, and means for operating

said latter pulley, of a cable connected to the remaining upper pulley, a weight connected with the cable for operating the same, engaging-devices between the two pulleys, a mast carried by the upper shaft, a transverse yoke-bar carried by the weighted pulley and extending through opposite grooves in the standard and engaging the mast, a pneumatic cylinder arranged at the side of the standard, a weighted plunger arranged therein, a vent at the lower end of the cylinder, and a connecting-rod between one end of the yoke-bar and the plunger, substantially as specified.

9. In a railway gate, the combination with the hollow standard, the transverse shaft, the mast mounted on the shaft, the large and small pulleys carried by the shaft, the transverse yoke-bar extending from the large pulley through curved slots in the standard and engaging the mast, a lower transverse shaft, a pulley carried thereby, an endless belt connecting the said pulley with the small pulley of the upper shaft, of a rear frame having guides, a cable connected to the large pulley and extending to the guides, a weight mounted for movement in the guides and connected to the cable and provided at its lower end with a catch, brackets extending from the guides, a horizontally pivoted latch spring-pressed in the path of the catch, a connecting rod between the lower pulley and the latch, means for operating the lower shaft, a pneumatic cylinder, a vent at the lower end thereof, a weighted piston arranged in the cylinder, a piston-rod projecting through the head of the cylinder, and a connecting-rod between the upper end of the piston-rod and the outer end of the yoke-bar, substantially as specified.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in the presence of two witnesses.

AIMÉ BARRE.

EDWARD ^{his} X CURRIER.
mark

Witnesses:

JEAN B. GANDREAN,
FERDINAND HEALY.