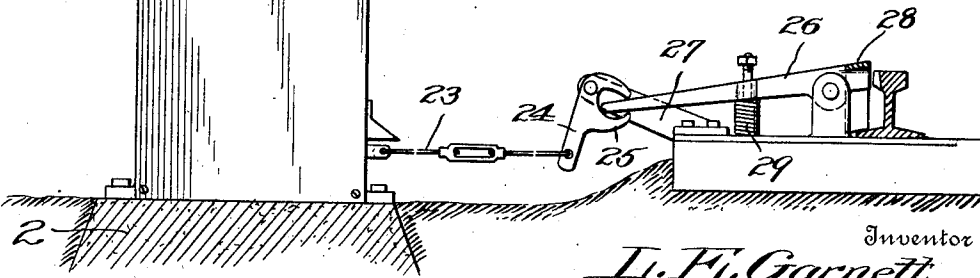
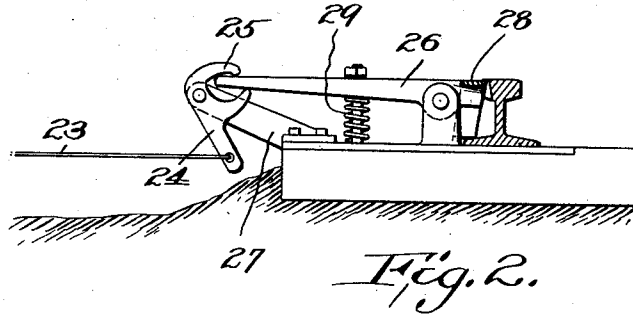
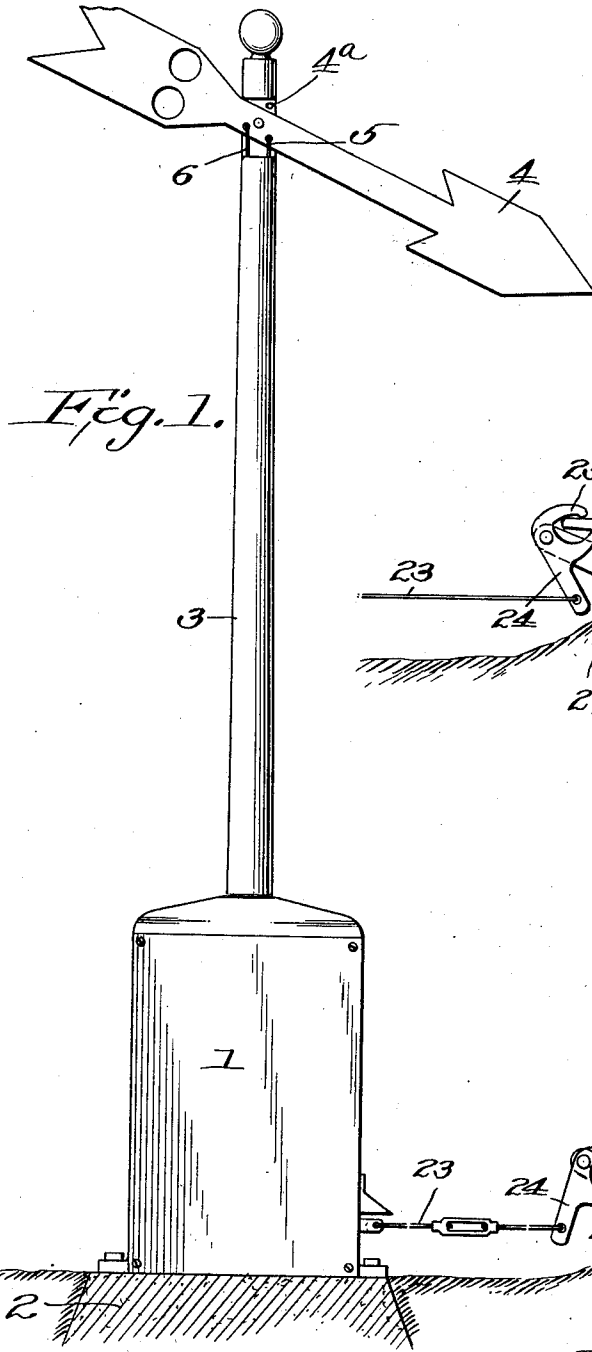


L. E. GARNETT.
 DEVICE FOR OPERATING SEMAPHORE ARMS.
 APPLICATION FILED NOV. 9, 1911.

Patented Apr. 15, 1913.
 3 SHEETS—SHEET 1.

1,058,742.



Witnesses

Oliver H. Holmes
E. B. McRath

Inventor
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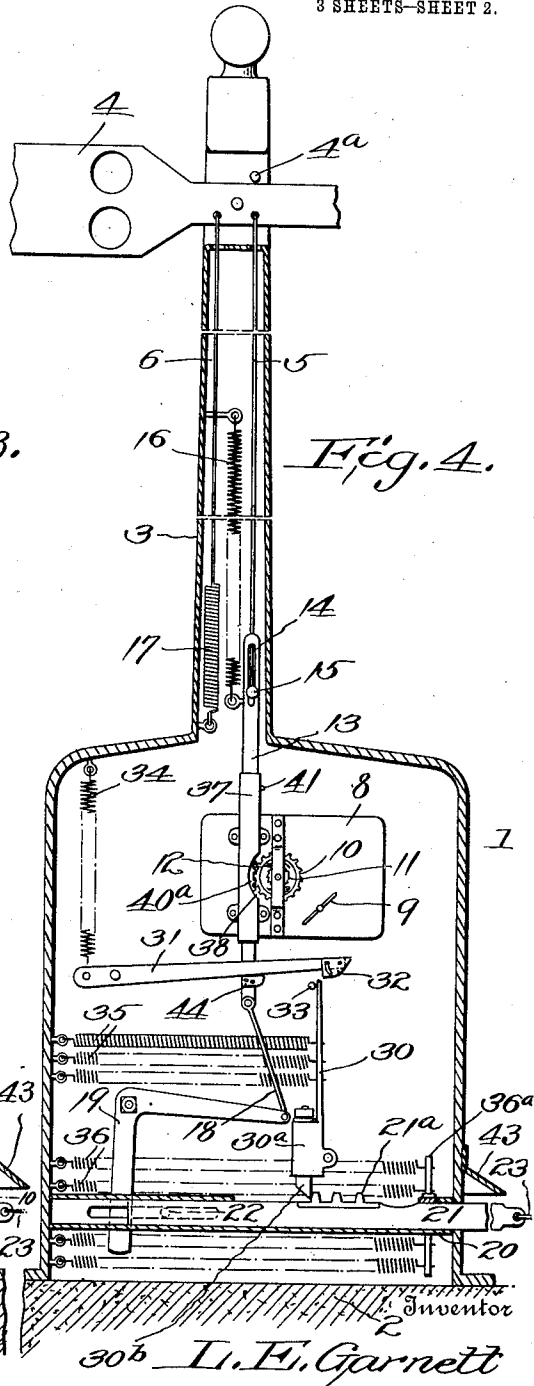
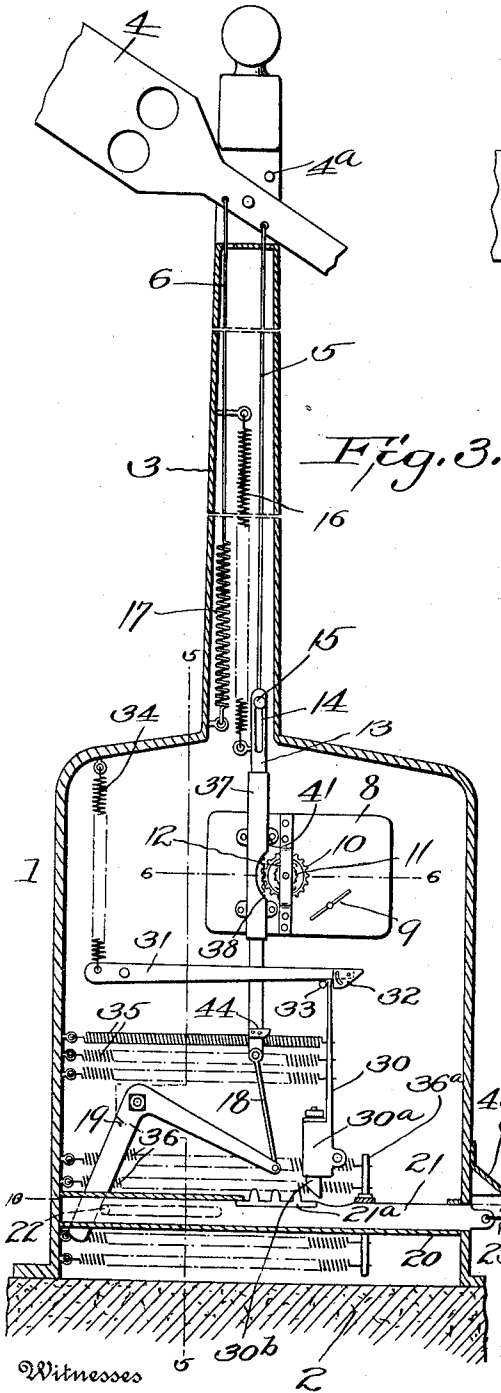
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3 SHEETS—SHEET 2.



Witnesses
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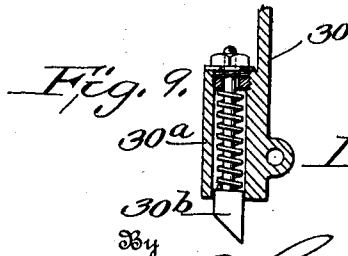
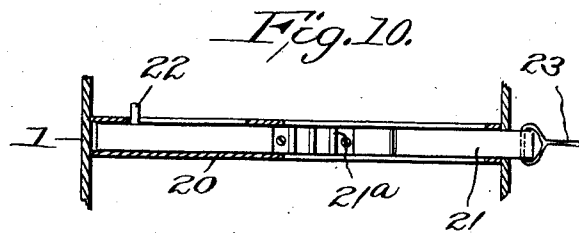
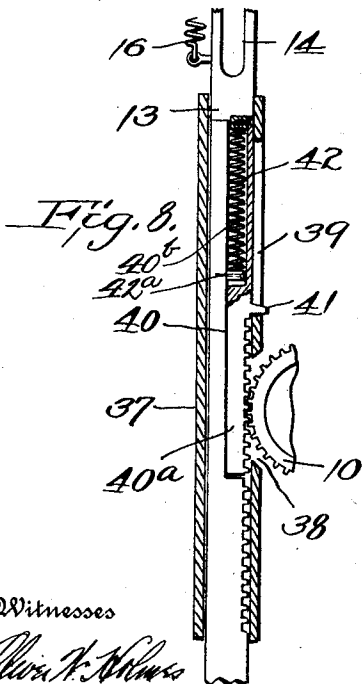
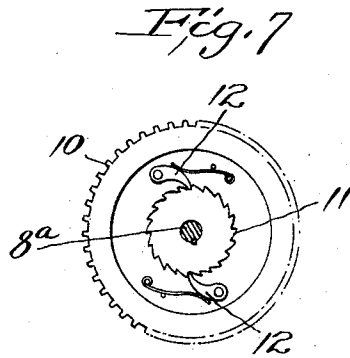
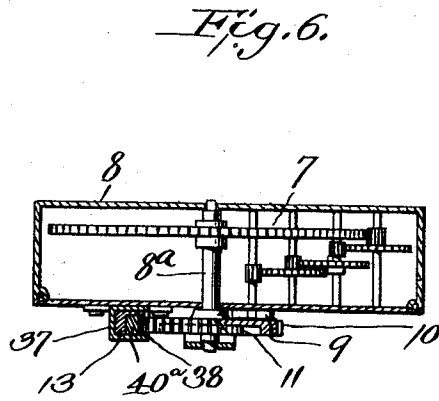
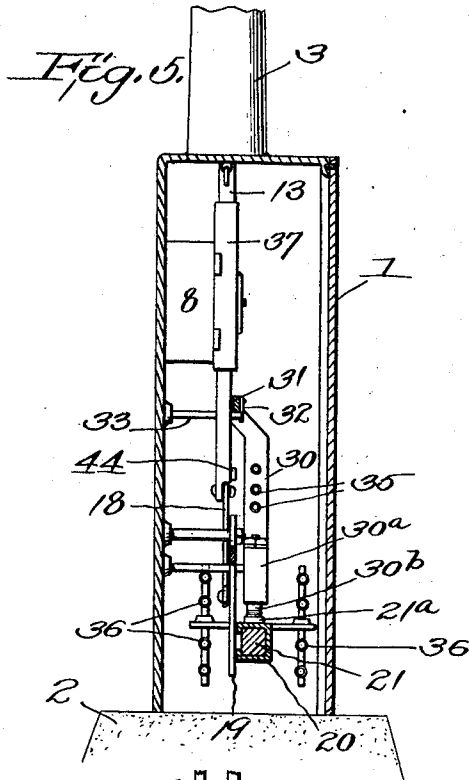
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1,058,742.

Patented Apr. 15, 1913.

3 SHEETS—SHEET 3.



Witnesses

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UNITED STATES PATENT OFFICE.

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JONATHAN L. BARNES, OF CHANUTE, KANSAS.

DEVICE FOR OPERATING SEMAPHORE-ARMS.

1,058,742.

Specification of Letters Patent.

Patented Apr. 15, 1913.

Application filed November 9, 1911. Serial No. 659,380.

To all whom it may concern:

Be it known that I, LEMUEL E. GARNETT, a citizen of the United States, residing at Chanute, in the county of Neosho and State of Kansas, have invented a new and useful Improvement in Devices for Operating Semaphore-Arms, of which the following is a specification.

This invention relates to an improvement upon the signal devices shown in the patents granted to me and bearing numbers 940,800, and 1,027,382.

While this invention includes a number of parts common to the devices shown in the applications above mentioned the parts have been re-arranged, more or less changed in construction and new elements have been added, thereby greatly increasing the efficiency of the device, and the main object of the present improvement is to insure certainty of the operation of the semaphore and also to isolate a portion of the mechanism so that jars and vibrations due to passing trains will not affect them; and a further object of the invention is to so arrange the tripping mechanism that only one wheel of a train will act thereupon, thus further reducing jars due to the passage of the remaining wheels.

A still further object of the invention is to provide a device of this kind in which the speed of the train or the wearing of the car wheels will not disturb the operation of the signal, the device operating with trains running at slow rates of speed in the same manner as with those traveling at a high speed, and being tripped by old and worn wheels as quickly as by a new wheel.

With these various objects in view, the invention consists in the novel construction and arrangement of the parts as hereinafter described, pointed out in the claims and shown in the accompanying drawings, in which,

Figure 1 is a side elevation, parts being shown in section, and the track mechanism being shown in set position. Fig. 2 is a side elevation of the track mechanism, parts being in section, and showing the parts in position after being tripped or engaged by the first wheel of the train. Fig. 3 is a sectional view through a casing showing the interior mechanism in side elevation, and with the parts in the position shown in Fig. 1. Fig. 4 is a similar view showing the rela-

tive position of the parts within the casing when the track mechanism is in the position shown in Fig. 2. Fig. 5 is a vertical section on the line 5—5 of Fig. 3. Fig. 6 is an enlarged section upon the line 6—6 of Fig. 3. Fig. 7 is a face view of the pawl and ratchet mechanism, shown partly in section in Fig. 6. Fig. 8 is an enlarged detail view partly in section illustrating a construction of a two-part rack bar. Fig. 9 is a detail sectional view illustrating the construction of a spring pressed bolt. Fig. 10 is a plan view, the casing being in section of a horizontal slidable toothed bar.

In the drawings, 1 represents a casing mounted upon a concrete or other suitable base, and carrying a hollow semaphore post 3, upon which is mounted a semaphore arm 4, the upward movement of which is limited by a stop pin 4^a, and to which is connected upon opposite sides of the pivotal point of the semaphore arm, suitable pull rods 5 and 6. The above mentioned parts are common to the devices previously referred to.

In the casing 1 is a suitable gear train arranged within a casing 8 and which includes a governor or fan 9. This gear mechanism is substantially similar in construction and operation as that shown and described in the patent above referred to acting as a governor or retarding device. Upon the exterior of the casing 8 and mounted loosely upon the main shaft of the spring motor is a gear 10. A ratchet 11 is fixed upon said shaft and suitable spring pressed pawls 12 carried by the gear 10 permit the gear to turn loosely in one direction and lock the same to the shaft 8^a of the motor upon rotation in the opposite direction, this mechanism being disclosed in the pending application referred to.

A sectional rack bar 13 has its upper portion slotted as shown at 14 and a pin 15 carried by the rod 5 works in said slot thereby connecting the said pull rod to the rack bar 13 but permitting an initial movement of the said rack bar relative to the pull rod. A suitable spring 16 has its upper end secured within the post 3 and its lower end is secured to the rack bar 13. The pull rod 6 is connected at its lower end to a spring 17, the lower end of which is also secured within the lower portion of the post 3. The rack bar is of a peculiar construction as will be

more fully explained hereafter. The lower end of the rack bar is pivotally connected by means of a link 18 to one arm of a bell crank 19. Slidably mounted within a suitable casing 20 is a bar 21 which carries upon one side a pin 22 which pin engages the free arm of the bell crank 19. The outer end of the bar 20 is connected by means of a suitable rod 23 with a lever 24, which lever has adjacent its pivotal point and upon one side two curved converging lips 25, said lips forming a trigger between which is held the outer end of a pivoted tripping bar 26. The lever 24 is pivotally mounted upon a suitable bracket 27. The tripping bar 26 has a bowed spring 28 resting transversely across its inner end, which spring is also shown in the applications above referred to. A suitable coil spring 29 is placed beneath the tripping bar 26 and between its pivotal point and the lever 24, said spring being of sufficient strength to throw the bar 26 into the position shown in Fig. 2 in the case of the breaking of the rod 23, thereby preventing the wheels of the train striking the said bar if said rod breaks. In a set position the tripping bar will engage the lips 25 so as to hold the lever 24 inclined toward the casing 1, and at the same time holding the inner end of the bar 26 in position to be engaged by a wheel of a train, said wheel acting upon the bar by engaging the spring 28.

It will be obvious that when the device is set so that the bar 26 is in position to be depressed by a train wheel the semaphore will be in a lowered or safety position. As soon as the bar 26 is struck by the first wheel upon the train and depressed the lever 24 will be rocked the lips occupying the position shown in Fig. 2 thereby holding the bar 26 in an inoperative position so that none of the other wheels of that train affect it. This movement of the lever 24 is also communicated to the wire 23 and to the parts within the casing and the semaphore arm is lifted, as will appear more fully hereinafter when the details of the interior construction are described.

A lever 30 is pivoted within the casing adjacent its lower end and immediately above the bar 21 and said lever carries a casing 30^a in which is a spring pressed bolt 30^b, beveled upon its rear face, said bolt being adapted to be engaged by teeth 21^a carried by the bar 21 and in order to permit replacement of worn teeth, I prefer to have the said teeth formed upon a separate piece or strip adapted to be inserted in the bar 21. A locking lever 31 is also pivoted within the casing and is provided with a pivoted head or hook 32 and the upper free end of the lever 30 will normally rest between said hook and a fixed pin 33, thus preventing the lever 30 from swinging upon its pivot point. The hook 32 is practically formed of a triangular-

shaped slotted plate pivoted upon the lever 31, the slot having a suitable pin entering it so that movement of the plate 32 upon its pivot point is limited. A spring 34 is connected at one end to the top of the casing 1 and at its lower end to the rear end of the lever 31, said spring normally holding the lever 31 in engagement with the pin 33. Three or more springs 35 are connected to the rear side of the casing and have their forward ends secured to the lever 30, thus insuring proper movement of said lever in case of the breakage of one or more of the springs. Suitable springs 36 preferably eight in number are divided into sets of four, the said springs being connected respectively to the rear of the casing and to vertical arms 36^a carried respectively by opposite sides of the bar 21. These springs are also in duplicate so that the breaking of one or more of the springs will not interfere with the working of the device.

The rack bar 13 slides through a vertical casing 37 which is cut out as shown at 38 to permit the gear wheel 10 to engage with the teeth of the rack bar and is also longitudinally slotted as shown at 39 for a purpose to be hereinafter explained.

As previously stated the rack bar 13 is formed in sections, and the main body of the rack bar having its upper portion longitudinally cut away as indicated at 40 and a short rack bar section 40^a is inserted in said cutout portion. The toothed portion of the bar 40^a terminates in an enlarged tooth 41, said tooth being arranged at the upper end of the rack portion of the bar. Above said tooth the bar 40^a is longitudinally recessed as shown at 40^b and in said recess is arranged a spring 42. The bifurcated portion 14 is carried by the bar 40^a, and the spring 42 at its upper end bears upon the said bifurcated portion, and at its lower end bears upon a lug 42^a, which is secured in the lower portion of the recess 40^b, said lug 42^a being fastened to the main body portion of the bar 13. The tooth 41 travels in a slot 39 of the casing 37 and it will be obvious that as the bar 13 moves downwardly the section 40^a will have its downward travel stopped by engagement with the lower end of said slot. This will permit the body portion of the bar to drop slightly lower, sufficient to form a small space between the two sections thereby preventing jars and vibrations caused by the successive car wheels of a train passing over the track mechanism from effecting the operation of the governor mechanism, the gear wheel 10 meshing at such time with the rack portion of the bar 40^a. The spring 42^a acts as a cushion between the body portion of the bar and the bifurcated portion 14 carried by the section 40^a.

It will of course be understood that as the

rack bar moves upwardly the main body portion will first move and close up the space between the two portions of the bar, and said portions will then act during upward movement as one continuous bar. A tripping block 44 is placed upon the lower portion of the rack bar 13 and engages the lever 31 and by lifting said lever releases the upper end of the lever 30, thereby permitting the same to swing upon its pivotal point, which allows the teeth 21^a to pass rearwardly beneath the spring bolt 30^b. The forward movement of the teeth under said bolt is provided for by the beveling of the rear face of the bolt.

It will be understood that the bar 31 is not connected to the bell crank 19 or directly connected to any part of the mechanism controlling movement of the semaphore arm. When the parts are in the position shown in Fig. 3 the pin 22 carried by the bar 21 bears against the free end of the bell crank and holds the parts in the position shown. But when a wheel of the train strikes the tripping lever 26 the bar 21 is pulled outwardly and the pin 22 leaves the bell crank 19, and consequently none of the shock due to the passage of the train over the tripping mechanism is transmitted to any part of the semaphore operating or time controlling mechanism. When the said bar 21 is drawn outwardly the running of the governor mechanism will regulate the upward movement of the rack bar and the turning movement of the bell crank. This will slowly lift the block 44 and this will finally come into engagement with the lever 31 thereby releasing the upward end of the lever 30. During this slow upward movement of the block 44, the lever 30 has been locking the bar 21 in the position shown in Fig. 4, thus allowing ample time for the remainder of the train wheels to pass the lever 26 without striking the same.

In Fig. 4 I have illustrated the parts in the position occupied just as the block 44 lifts the lever 31. This position is assumed only for an instant as with the parts in this position the springs 36 will at once draw the bar 21 back, thus resetting the mechanism adjacent the track, and by reason of the pin 22 striking the bell crank again drawing the semaphore arm and the mechanism connected thereto downwardly. The device will then be reset and ready for the following train.

A suitable water shed 43 is placed upon the front of the casing thus preventing rain from driving in through the opening through which the bar 21 works also preventing the accumulation of snow and ice about said opening.

What I claim is:

1. The combination with a track tripping mechanism and a semaphore arm, of a verti-

cally movable rack bar, a governor mechanism engaging said rack bar and adapted to retard movement of the rack bar in one direction, a bell crank, means for connecting one end of the bell crank to the rack bar, a horizontal bar, springs for normally drawing said horizontal bar in a direction away from the track, a pin carried by the last mentioned bar and adapted to rock the bell crank upon movement of said bar by the springs, said bar being provided with teeth, a pivoted catch adapted to engage said teeth, means for locking said catch in normal position, said locking means being released by upward movement of the rack bar, the track mechanism when tripped by a train wheel drawing said horizontal bar toward the track against the tension of said springs.

2. A device of the kind described comprising a rack bar, a governor mechanism comprising a fan and a gear meshing with the rack bar, said gear being locked to the governor mechanism upon upward movement of the bar, the fan serving to retard said upward movement, a bell crank secured to the lower end of the rack bar, a spring actuated slidable bar, a pin carried by said bar and adapted to engage the bell crank upon inward movement of the bar, thereby lowering the rack bar, a spring adapted to lift the rack bar, and mechanism arranged adjacent a railroad track and adapted to draw said spring actuated bar outwardly when engaged by a train wheel.

3. In a device of the kind described, a semaphore arm, a rack bar to which said arm is operatively connected, said rack bar being longitudinally recessed, a rack section slidably held in said recessed portion, means for limiting downward movement of the said slidable portion, a governor mechanism comprising a gear and adapted to engage both portions of the rack bar and suitable wheel tripped mechanism for regulating movement of the rack bar.

4. In a device of the kind described, a casing having a cut-out portion and a longitudinal vertical slot, a rack bar adapted to work vertically through said casing, a semaphore arm, train actuated devices, the bar having its upper and lower ends connected respectively to said arm and said train actuated devices, the said bar being longitudinally recessed, a short rack section arranged loosely in said recess, an enlarged tooth upon said section adapted to work in the slot of the casing, the length of said slot limiting movement of the said short section of the rack bar, the main body portion of the bar having a slightly greater downward travel, a spring arranged in the recessed portion of the bar and bearing downwardly upon the upper end of the short rack portion, and a retarding device comprising a gear wheel adapted to mesh with both por-

tions of the rack bar through said cut-out portion of the casing.

5. A device of the kind described comprising a semaphore arm, a vertically movable bar operatively connected to said arm, suitable bar operating mechanism comprising a horizontal slidable bar, springs normally tending to pull said bar inwardly, a lever pivoted adjacent to and at right angles to a track rail, a second lever having curved converging lips between which the outer end of the first mentioned lever rests, and means for connecting an end of the second mentioned lever to the said slidable bar.

6. In a device of the kind described, a horizontally slidable bar, springs for drawing said bar inwardly, teeth arranged upon said bar, means arranged adjacent a track adapted to be engaged by a car wheel and when so engaged drawing said bar outwardly against the tension of the springs, a pivoted catch adapted to engage said teeth, a pin, a pivoted lever having a hooked member, the free end of the catch normally resting between said pin and the hooked member, springs adapted to hold said catch normally in engagement with the pin, a semaphore arm, a bar operatively connected to said semaphore arm, a bell crank to which said bar is operatively connected, means carried by the slidable bar adapted to engage the bell crank, and means carried by said bar for engaging the last mentioned lever and releasing the pivoted catch.

7. A device of the kind described comprising a horizontally movable toothed bar, springs adapted to normally draw said bar inwardly, a semaphore arm, means actuated

by inward movement of the said bar for drawing said arm downwardly, a tripping mechanism arranged adjacent the track and adapted to be tripped by a train wheel, said mechanism being operatively connected to the said slidable bar, a pivoted catch comprising a spring pressed bolt beveled upon its inner face and adapted for engagement with the teeth of the bar, a pin limiting movement of said catch in one direction, springs for normally holding the catch in engagement with the pin, a lever having a hook member adapted to normally prevent swinging movement of the pivoted catch away from said pin, and means for lifting said hooked lever at a predetermined time thereby permitting the teeth upon the bar to slide beneath said spring pressed bolt, as and for the purpose set forth.

8. A device of the kind described comprising a tripping mechanism arranged adjacent a track, a semaphore arm, mechanism for controlling movement of said arm, said mechanism including a bell crank, and a slidable bar connected to the track tripping mechanism, and a pin carried by said bar, said pin being adapted to engage and move an arm of the bell crank upon inward movement of said bar and to be disengaged upon outward movement of the bar, thereby disconnecting the track tripping mechanism when the bar is moved outwardly, as and for the purpose set forth.

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Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."