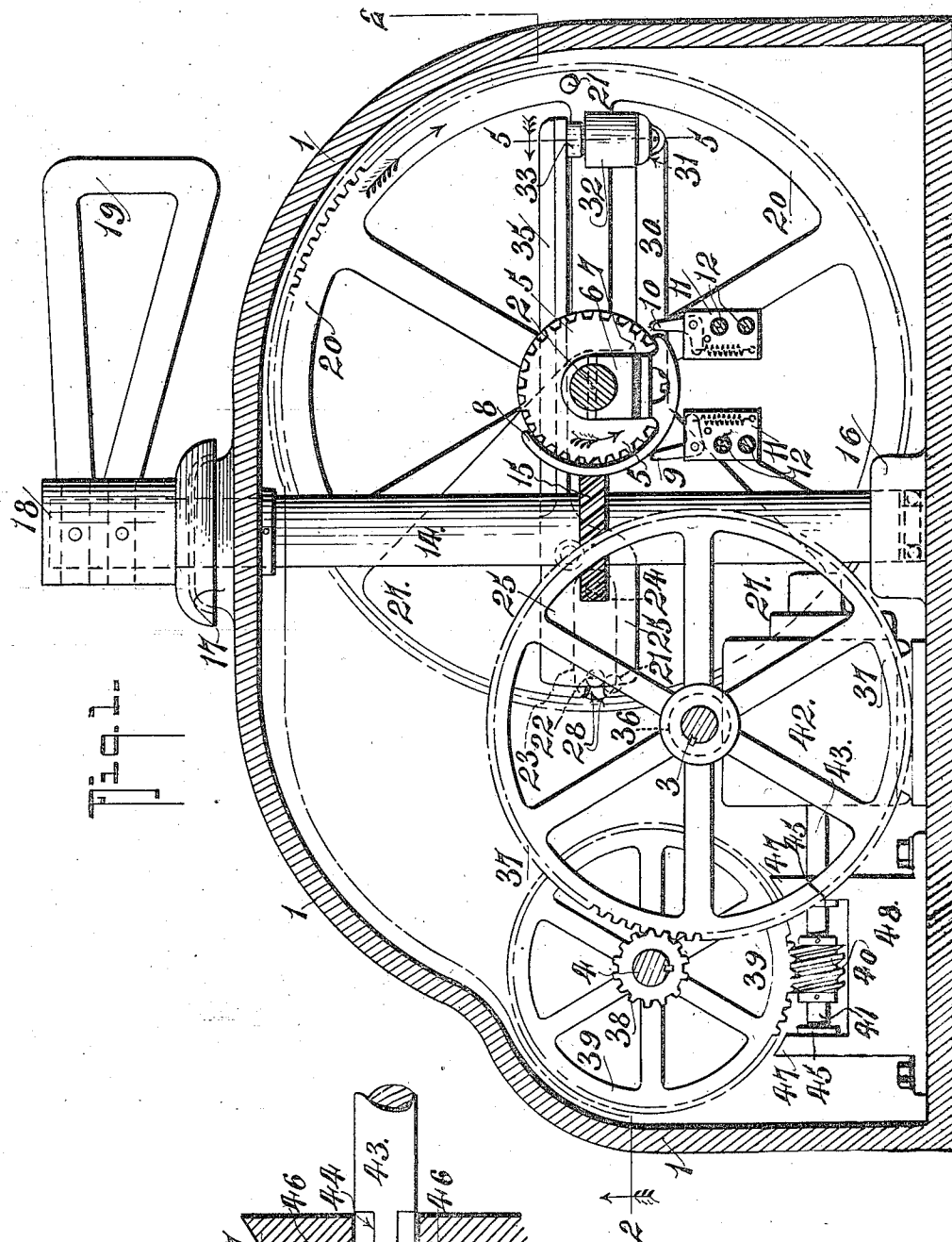


J. F. WEBB, JR.
 TRAIN SIGNALING AND CONTROLLING SYSTEM.
 APPLICATION FILED MAY 6, 1911.

Patented Feb. 11, 1913.

5 SHEETS-SHEET 1.

1,052,632.



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5 SHEETS—SHEET 2.

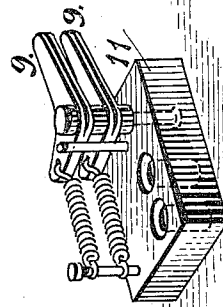
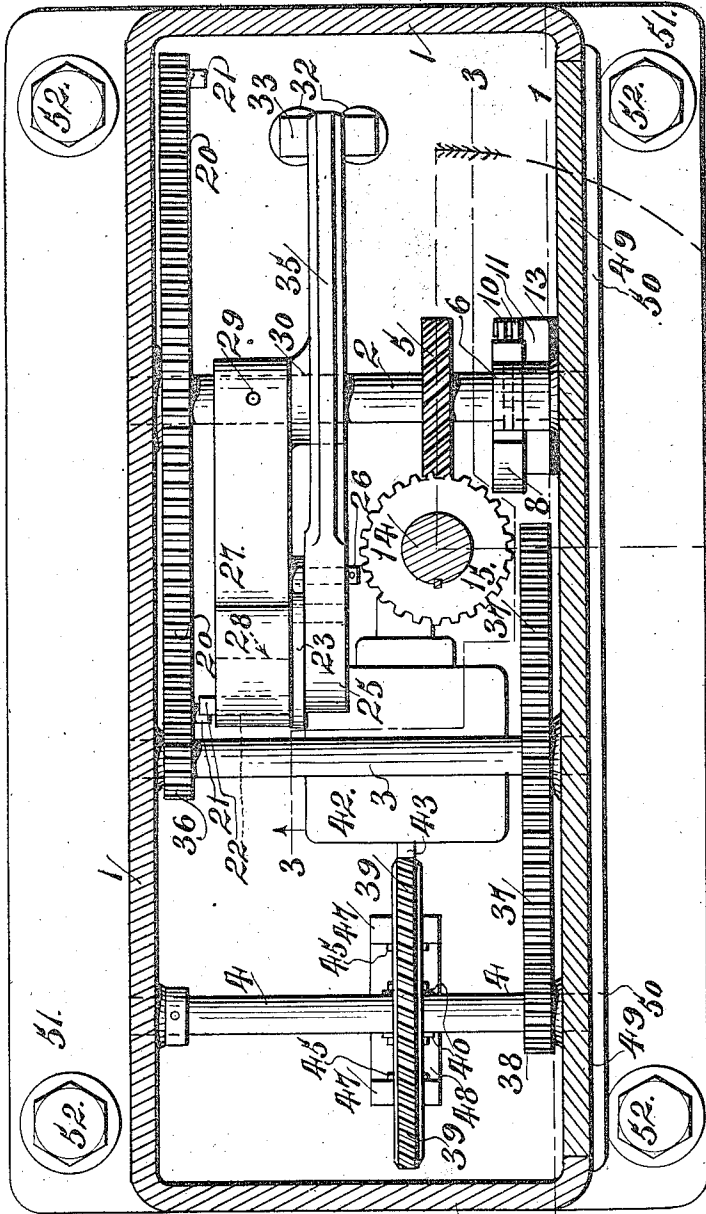


Fig. 9.

WITNESSES:

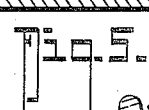
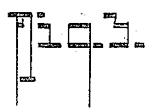
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1,052,632.

6 SHEETS—SHEET 3.



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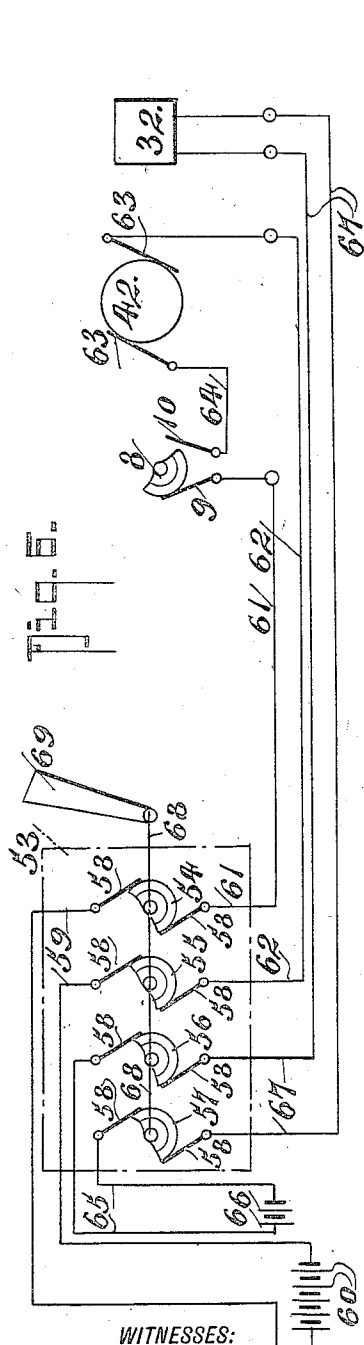
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J. F. WEBB, JR.
 TRAIN SIGNALING AND CONTROLLING SYSTEM.
 APPLICATION FILED MAY 6, 1911.

1,052,632.

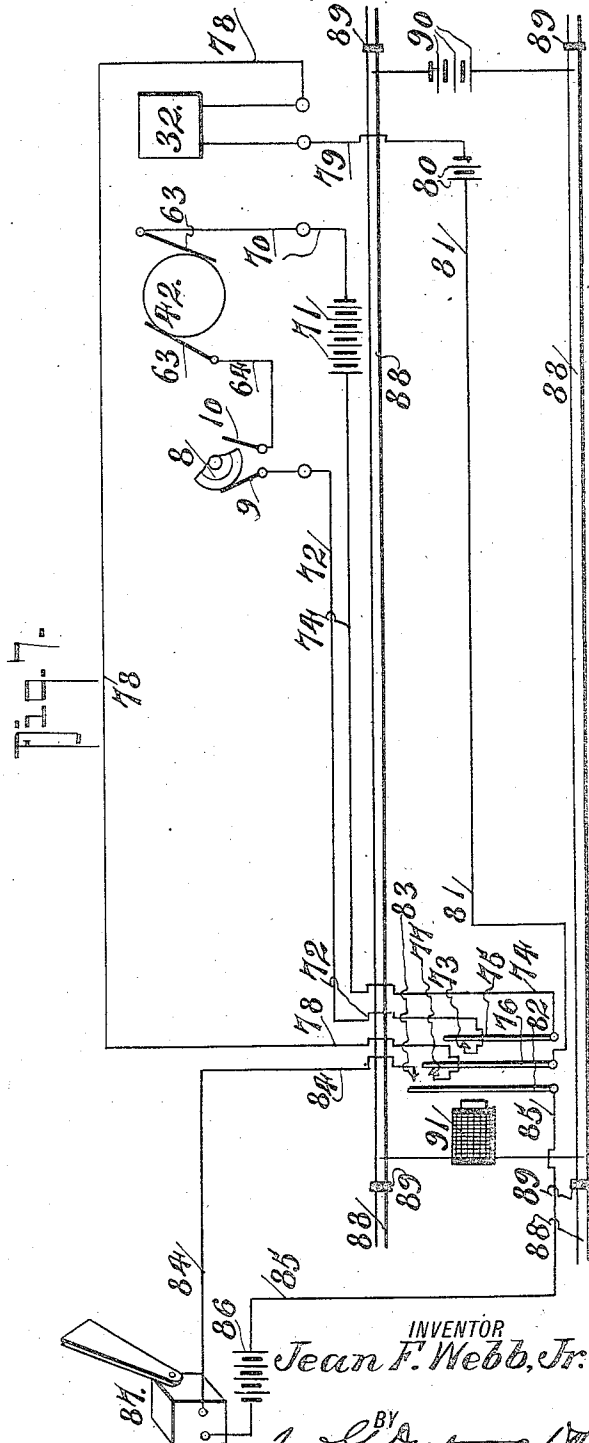
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5 SHEETS—SHEET 4.



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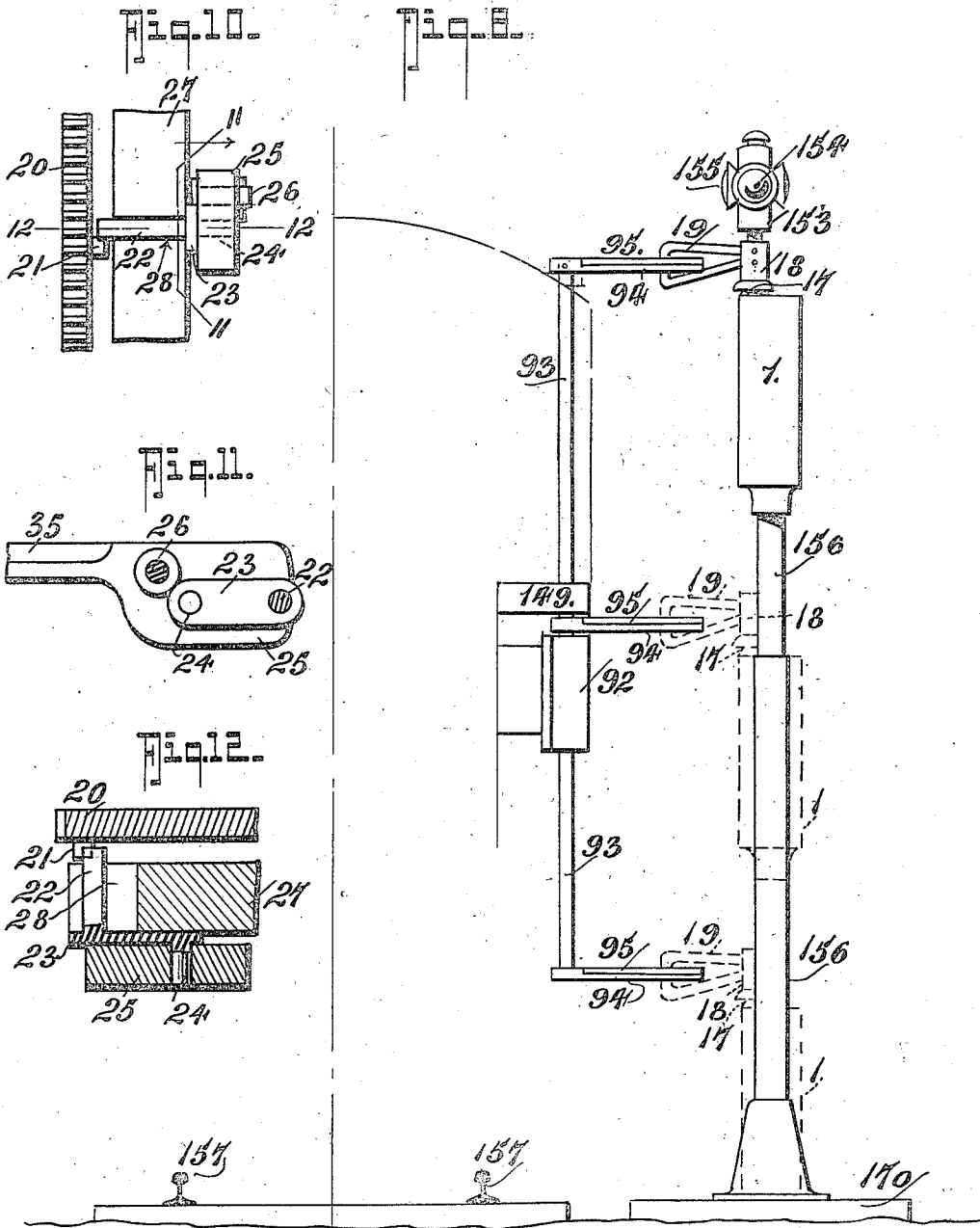
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 APPLICATION FILED MAY 6, 1911.

1,052,632.

Patented Feb. 11, 1913.

5 SHEETS—SHEET 5.



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UNITED STATES PATENT OFFICE.

JEAN F. WEBB, JR., OF NEW YORK, N. Y., ASSIGNOR TO ELECTRIC SIGNAGRAPHS & SEMAPHORE CO., INCORPORATED, OF NEW YORK, N. Y.

TRAIN SIGNALING AND CONTROLLING SYSTEM.

1,052,632.

Specification of Letters Patent.

Patented Feb. 11, 1913.

Application filed May 6, 1911. Serial No. 625,522.

To all whom it may concern:

Be it known that I, JEAN F. WEBB, JR., residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Train Signaling and Controlling Systems, of which the following is a specification.

This invention relates to that type of train signaling and controlling systems known as the mechanical trip type in which a track "stop" is engaged by an arm on the train to actuate an air valve, thereby causing the application of the brakes. While a number of systems of this general type have heretofore been proposed, they have nearly all failed of adoption owing to practical difficulties encountered in their introduction to service conditions. Experience has taught "that in any signaling or train-control system, which is dependent upon electrical or mechanical contact between apparatus located along the roadway and apparatus fixed upon the moving vehicle, the contact must take place within the narrow zone lying outside of that imaginary line, beyond which other portions of moving equipment are not permitted to project, and within that imaginary line, inside of which other fixed structures along the roadbed are not permitted to project. On railroads passing only through open country, or through the more newly settled portions of the country, the encroachment of structures other than those erected for railroad purposes is less noticeable than on the older roads in the earlier settled parts of the land. Furthermore, the older roads were built at a time when cars and engines were much smaller than at the present day, and extensive and costly works, such as bridges and tunnels, were built to clearances that have, on account of the high cost of altering them, limited to a great extent an increase in size of the engines and cars. On the other hand, the demands of traffic have constantly called for larger cars and larger locomotives to haul them, and for this reason on many roads, particularly in the East, the available space between the equipment clearance line and the structure clearance line is so

small as to render the problem of designing contact devices to operate properly within permissible limits, exceedingly difficult. The introduction of electric traction, involving the use of working electrical conductors, such as the third rail, has to some extent complicated the situation by rendering a portion of this neutral zone unavailable for many forms of contacting devices intended to be used for signal or train-control purposes."

"The features and tendencies above noted argue in favor of devices which contact in the upper, rather than in the lower, portions of the clearance diagram; but while the use of such devices would present little difficulty on a railroad handling passenger traffic only, American practice in freight-car construction introduces important complications into the problem. Even with the extensive use of continuous-power brakes upon freight trains the presence of trainmen on top of freight cars is frequently necessary. Modern passenger trains are everywhere provided with means of communication from any car in the train to the engine, formerly by the bell or whistle cord, now almost universally by means of the air signal. Whether because of expense or through doubts of its practicability, freight trains in general are not so equipped, and the only communication between the front and rear ends of freight trains in general use in this country is by hand signals transmitted by trainmen riding on top of the cars. Furthermore, the varying character of the loads carried on flat cars or in gondola cars makes it desirable that the condition of such loads be frequently noted by the trainmen."

"When necessity arises for the use of the hand brakes, particularly in switching operations, the presence of trainmen on top of freight cars is necessary," and therefore, the device must not interfere with the free use by the trainmen on the top of the car.

It is, therefore, the principal object of my invention to provide a system in which the parts are so designed as to fulfil all of the above quoted requirements, and a system in which the stops may be used at various

positions on the clearance diagram, preferably however, in the upper or intermediate positions.

A further object of this invention is to provide a track stop of the semi-flexible, or semi-rigid type in which the contact arm, will when set, have sufficient inertia to move the train carried arm to its operative position, but will not oppose a resistless barrier to a more or less rigid obstruction on the train that may, perchance, be brought into contact with the track stop arm.

The invention, furthermore, has for its object to provide a device in which a service stop may be given to the train, rather than an emergency stop, although the device may be used equally as well to give an emergency stop, by simply modifying the mechanical design of the air-valve mechanism.

In addition to the foregoing objects, the invention has for its object to provide a device of such construction as to include the following characteristics, namely:—

1. The apparatus is so constructed that, "the removal or failure of any essential part will cause the display of the stop signal and the application of the train brakes."

2. Any "break, cross or ground, or failure of the source of energy in any of the electrical circuits employed, will cause the display of the stop signal and the application of the brakes."

3. The track apparatus "may be used upon the open roadway, on bridges, or elevated structures, in tunnels or subways, and where either steam or electricity is used as the propelling power."

4. The apparatus conforms "to recognized standards of clearance for rolling equipments and structures so that those portions of the apparatus placed upon the roadway will not be subjected to damage by rolling stock or engines, nor those portions placed upon the vehicle be damaged by any structures permitted to exist upon the roadway, and at the same time all vehicle parts and roadway parts which may have to come into operative relation have been so designed that proper operative relation will be assured under all conditions of speed, weather, wear of track or vehicles, oscillation, and shock."

5. The system will, "operate under all weather conditions which permit the operation of trains."

6. The system is "capable of control by the ordinary means used for indicating the condition of the block about to be entered, such as electric track circuit or semaphores, electrically or mechanically actuated."

7. The engine apparatus is "so constructed as to prevent release of brakes after an application has been made until the train has been brought to a stop, or the obstruction or

other conditions which caused the application have been removed."

8. The system is "so designed that should operating conditions require it, speed control may be used; that is, provision is made for a train to pass an automatic stop in tripping position without the application of the brakes, provided the speed is less than a predetermined number of miles per hour."

9. The system is "so designed that when no cause for stopping a train exists a definite and positive clear or proceed indication will be given at every point where a stop indication will be given or the brakes applied when adverse or dangerous conditions exist."

10. The system provides, when desired, "for a continuous display of indications."

The invention furthermore, provides a system and apparatus embodying those novel details of construction, combination and arrangement of parts, all of which, will be first fully described and then be specifically pointed out in the appended claims, reference being had to the accompanying drawings in which—

Figure 1 is a vertical longitudinal section on the line 1—1 of Fig. 2, the track stop arm being in its safety position and the continuous signal device being omitted. Fig. 2, is a horizontal section on the line 2—2 of Fig. 1, safety and danger positions of the stop arm being indicated by dotted lines and by dotted arrow. Fig. 3, is a section on the line 3—3 of Fig. 2 showing the position of the parts in full lines at the instant the electric circuit to the magnets 32 is broken, and the position of the parts in dotted lines at the time the weight has moved the stop arm to its danger position.

Fig. 4 is an enlarged detail section and part elevation of the worm shaft bearing and the coupling between the worm shaft and the motor shaft. Fig. 5 is a detail enlarged cross section on the line 5—5 of Fig. 1.

Fig. 6, is a diagrammatic view of semaphore controlled circuits for effecting the operation and the control of the track stop mechanism. Fig. 7, is a similar view, showing a modified arrangement of track stop control circuits. Fig. 8, is a diagrammatic elevation showing how the train-carried mechanism may be modified to be operated by track stops in three positions, the view also indicating one form of continuous signal on the track stop. Fig. 9, is a detail perspective view hereinafter referred to.

Fig. 10 is an end elevation of a part of the slot device looking from the left in Fig. 1. Fig. 11 is a section on the line 11—11 of Fig. 10 looking in the direction of the arrow, and Fig. 12 is a detail horizontal section on the line 12—12 of Fig. 10.

Referring now to the accompanying drawings and particularly to Figs. 1 to 5 in-

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clusive, the track stop device it will be seen, consists of a casing 1, in bearing apertures, of which a plurality of shafts 2, 3 and 4 are transversely mounted. The shaft 2 is the main operating shaft, and it carries a screw gear 5 preferably of a pitch of 45°, that meshes with a screw gear 15 on the vertical shaft 14 which carries the stop arm 19, hereinafter referred to. 6 is a commutator member secured to turn with the shaft 2 and having an annular segment 8 electrically insulated at 7 from the shaft carried portion 6 of the same. 9 and 10 are contact fingers, one set of which, 9, is in continuous contact with the annular member 8, while the other set, 10, does not come into contact with the same until the shaft 2 has begun to turn. Each set of contact fingers 9 and 10 is mounted on a block 11 which is secured by screws 12 to the frame 1 of the casing, the screws and blocks being insulated at 13. The shaft 14 at its lower end is mounted in a step anti-friction bearing 16 and passes through a water shed, bearing 17 in the top of the casing 1. 18 designates a cap that is fitted over the upper end of the shaft 14 to which it is secured by the projecting ends of the contact arm 19 that project through the cap 18 and shaft 14 and are secured by cross pins as best indicated in Fig. 1, the cap 18 having a petticoat to fit over the bearing 17 and form a water shed. Mounted loosely on the shaft 2 is a master gear 20 which has a pair of pins 21 to engage the pin 22 on the link 23 that is pivotally mounted at 24, on the auxiliary weight 25 that is in turn pivoted at 26 on a stud projecting from the main weight 27. The main weight 27 is slotted at 28 to permit the pin 22 to project through the same. The weight 27 is pinned at 29 to turn with the shaft 2 and it has an arm 30, whose projecting end 31 carries the electro-magnets 32 which serve to draw the cores 34 on the cross bar 33 of the arm 35 that projects from the auxiliary weight 25, and hold the arms 30 and 35 parallel to one another. 36 is a pinion mounted on and to turn with the shaft 3 and mesh with the master gear 20, while 37 designates an intermediate gear keyed to the shaft 3 to mesh with a pinion 38 on the shaft 4, the shaft 4 having a worm gear 39 secured thereto to mesh with the worm 40 on the worm shaft 41. The worm shaft 41 is mounted in bearing members 47 of the support 48 that is secured to the bottom of the casing 1. In order to reduce friction, the shaft 41 is provided with bearing cones 45 and the bearing members 47 are provided with anti-friction balls 46 against which the cones 45 engage, as best shown in Fig. 4 of the drawings. The pitch of the worm 40 is of such a high angle that it cannot be operated by the gear 39, and the worm 40 will thus hold the train of gears immovable while the worm is at

rest. The shaft 41 is slotted at 44 to receive the tongue of the motor shaft 43 that connects the motor 42 with the worm shaft 41. The casing 1 may be provided with doors 49 conveniently located to permit access to the interior of the same, the doors having petticoat portions 50 to form water sheds. The casing 1 has flanges 51 through which bolts 52 may pass to secure the casing to a suitable bed.

By referring now more particularly to Fig. 6, the preferred method of operating the track stops from a semaphore switch will be seen. In this figure the semaphore switch is indicated by 53 and includes the shaft 68, on which the semaphore blade 69 may be mounted. Mounted on the shaft 68 are commutator segments 54, 55, 56 and 57 with each one of which a pair of separate brushes or contact fingers 58 engage. One set of fingers or brushes 58 (the lower set in Fig. 6) continuously contact the commutator segments, while the other set are designed to be disconnected from the segments when the semaphore blade is in the danger position. 59 designates a pair of wires connected to one of the brushes 58 of each of the commutator segments 54 and 55, and the wires 59 lead to a motor operating battery 60. The other brushes 58 that engage the commutator segments 54 and 55 connect, one by a wire 61, to the continuously connecting brush or finger 9 of the track stop commutator, while the other, 62, connects to one of the brushes 63 of the motor 42 whose other brush 63, connects by a wire 64 with the contact finger or brush 10 of the track stop commutator 8. One each of the brushes 58 of the commutator segments 56 and 57 respectively connect through wires 65 with the lock and release battery 66, while the other brushes 58 of the other commutator segments 56 and 57, connect through wires 67 to the lock and release magnets 32 of the train stop device.

By referring now particularly to Fig. 7, the preferred method of operating the track stop from a block system will be seen. In this figure the tracks 88 are divided into insulated blocks as at 89, and each block, at one end, is provided with a battery 90 that bridges the rails, while at the other end the magnet 91 of a relay is bridged across the rails. The relay armature includes three contact segments, 75, 76 and 82, one, 82, of which may be connected by a wire 85 to a semaphore operating battery 86, that is in turn connected to the semaphore mechanism 87. The relay is also provided with three fixed contacts 73, 77 and 83, the latter one of which is connected by a wire 84 with the semaphore mechanism 87. The lock and release magnets 32 are connected through a wire 78 to the contact 77 and they are also connected through a wire 79 to a battery 80

which is in turn connected by wires 81 to the armature contact member 76. The restoring motor 42 of the train stop device has one brush 63 connected by a wire 64 to the normally disconnected contact finger 10 of the commutator 8. The other contact finger is connected by a wire 72 with the fixed relay contact 73. The other motor brush 63 is connected by a wire 70 to a battery 71 which is in turn connected by a wire 74 with the armature segment 75.

When it is desired to give a continuous display of signals along the track where the track stops are located, a signal lantern 153 may be mounted on the cap 18 to turn with the same and to disclose a red light 154 when the arm 19 is in the stop position and to disclose a white light 155 when the same is in the safety or clear position. Instead of using the lantern 153 (or in conjunction therewith if desired) colored signal disks (not shown) of the well known types may be employed.

When the track stop 1 is to be used in the upper clearance space, it is mounted on a suitable pole 156 which is mounted on a suitable base 170 adjacent to the track way 157 (see Fig. 8). When the track stop is to be used in the second or intermediate clearance space (at the bottom of Fig. 8) the casing 1 is mounted directly on the base 170; (the lower clearance space is not occupied by my apparatus in this case.)

While I have shown in Fig. 8 a modification by which in addition to the second or intermediate space (at the bottom of Fig. 8) and the upper clearance space (at the top of Fig. 8), a third location for the stop is provided, yet in practice this third location (being the middle one in Fig. 8) will rarely if ever be used on roads at present in operation, and I have simply indicated it to show the adaptability of my apparatus to use in any location that may be found advantageous in practice.

In Fig. 8 I have indicated the relative positions in which my system may be employed, with relation to the clearance diagram and in that figure, 92 designates the casing for holding the shoe 94 projected across the right of way, and 149 designates the casing in which the air valve mechanism is located, while 93 indicates the shaft on which the shoe 94 is mounted. The shoe 94 includes a wear plate 95 as indicated.

While I have referred to the train-carried apparatus in a general way and in a general way indicated its desirable properties, in this application, I make no claim to the construction of the train-carried mechanism *per se*, as that forms the subject matter of my divisional application, filed on July 8, 1911, Serial #637432.

Operation of the track stop.—By referring particularly to Figs. 1 to 6 inclusive, it

will be seen that when the semaphore blade 69 drops to its danger position, the electric motor operating circuits and the release magnet circuits will be broken by the commutator segments 54, 55, 56 and 57, thus permitting the magnets 32 to become de-energized, thereby releasing the armature 33 and permitting the auxiliary weight 25 to drop from the position shown in Fig. 1 to that shown in Fig. 3. This movement causes the link 23 to draw the pin 22 out of contact with the pin 21 and permits the main weight 27 to drop, thereby turning the shaft 2 counter-clock-wise in Fig. 1, which causes the shaft 14 to turn in the direction of the dotted arrow in Fig. 2 and move the arm 19 from the position shown in full lines in Figs. 1 and 3 to the position indicated in heavy dotted lines in Fig. 3, and thereby project the arm 19 in a direction across the right of way (it being understood that the casing 1 is mounted parallel to the right of way). The arm 19 is now in a position to be engaged by the shoe 94 of the train carried mechanism. Should the arm 19 be engaged by some relatively rigid obstruction on the train the arm 19 will be farther moved in the direction of the arrow in Fig. 2 toward the left of such figure, and thereby cause the weight 27 to move up in a counter-clock-wise direction from the heavy dotted line position in Fig. 3. Thus it will be seen the arm 19 will yield to a rigid obstruction on the train, and as soon as the obstruction has passed, the weight 27 will reassume the heavy dotted position in Fig. 3 to again hold the arm 19 in a direction across the right of way and in a position to be engaged by the shoe 94 on the train carried apparatus. Thus danger of injuring the track stop to render it inoperative, by some relatively rigid obstruction of the train is avoided. After the arm 19 has been set transversely into its danger position, when the lock and release magnet circuit has again been closed and the motor circuit 42 has again been closed at the external switch 53, then the motor 42 will be set into operation (the circuit being closed between 8 and 10 when the parts are in the heavy dotted position of Fig. 3) thus causing the motor 42 to turn the master gear 20, through the intermediate gear connections in the clock-wise direction indicated by the arrow in Fig. 1 until a pin 21 engages the pin 22 (see heavy dotted lines in Fig. 3), whereupon the weight 27 will be again locked to the master gear and will turn with the same until the position shown in Fig. 1 is reached. Just prior to the time the parts reach the position in Fig. 1, the motor operating circuit (but not the lock and release magnet circuit) will be broken between the commutator segment 8 and the contact finger 10 to

disconnect the motor 42 from the circuit, the momentum of the motor and parts being sufficient to complete the movement of the parts until they assume the position shown in Fig. 1 of the drawings.

In Fig. 7 the operation will be apparent by mere inspection of the drawing. In this figure the motor operating circuit, and the lock and release magnet circuit, are controlled by the relay switch, the operation of the mechanism shown in Fig. 1, being however, the same.

If it is desired that the system should stop the train absolutely, the relative power of the spring of the train-carried shoe and inertia of the track stop weight, will be so designed, that the arm 19 will not give until the shoe 94 has been turned, regardless of the speed of the train.

Should a rigid obstruction be encountered by the arm 19 such as a loose swinging car door, or some unauthorized projecting obstruction on the train, the arm 19 will simply turn toward the position opposite the full line position in Fig. 1, until the obstruction passes, when the track stop weight will restore the arm 19 to its danger position as before.

From the foregoing, it will be perceived that I have provided a very effective construction of apparatus in which the parts are strongly constructed and so designed as to require the minimum maintenance attention and expense.

Should any part of the track or semaphore circuits that control the operation of the track stop become interrupted or short circuited, the track stop weight will be instantly released to move the arm 19 to its danger position. It will also be noted that the track stop and train shoe may be located in the lower section of the clearance diagram or in any other desired place.

From the foregoing description taken in connection with the accompanying drawings, it is thought the complete construction, operation and advantages of the invention will be clearly apparent to those skilled in the art.

What I claim is:—

1. In a track stop, a support, a shaft journaled vertically in bearings in said support, an arm mounted on said shaft, and normally held parallel to the right of way, a second shaft journaled in bearings in said support and lying transversely with relation to said first mentioned shaft, gear connections between the two shafts, said gear connections being such that when either shaft is turned it will also turn the other shaft, gravity actuated means acting on said second shaft to turn said shafts to project said arm in a direction across the right of way, a holding means including a slot for holding said second shaft and its turning means in a

primary position, and means for releasing said holding means to permit said turning means to act, and means for restoring the aforesaid parts to their primary positions.

2. In a track stop, a vertically disposed freely oscillatable shaft, a horizontally disposed stop arm mounted on said shaft to turn with it and normally held parallel to the right of way, an oscillatable weight for turning said shaft to project said arm in a direction across said right of way, said arm and shaft being free to oscillate subject to the inertia of said weight, means for normally holding said weight from oscillation, and means for releasing said holding means to permit said weight to oscillate, together with means for controlling said releasing means.

3. In a track stop, a shaft, a stop arm carried by said shaft and normally held parallel to the right of way, a main driven shaft, gear connections between said driven shaft and said arm carrying shaft, a master gear loose on said driven shaft, motor actuated means for turning said master gear at times and including means for holding said master gear from turning at other times, a weight mounted on said driven shaft, means for connecting said weight and master gear to hold said weight in a normal position, said means including a lock and release magnet and a normally closed electric circuit containing said magnet, and means for releasing said weight from connection with said master gear when said electric circuit is broken to cause said weight to turn said driven shaft and thereby turn said arm carrying shaft to project said arm in a direction across the right of way.

4. In a track stop, a support, a stop arm, a carrying shaft for said arm mounted in said support to hold said arm normally parallel to the right of way, a weight for turning said shaft to project said arm in a direction across said right of way, said shaft when said arm is projected across said right of way being yieldable to turn in either direction subject to the inertia of the weight, means normally locking said weight from operation to hold said arm parallel to the right of way, and other means for restoring said weight to its initial position after it has operated to move said arm carrying shaft with its arm projected in a direction across the right of way.

5. In a track stop, an arm carrying shaft, a driven shaft operatively connected with said arm carrying shaft, a weight on said driven shaft, a slot device for holding said weight in a position ready to act and retaining said arm carrying shaft with its arm parallel to the right of way, said slot device including a lock and release magnet, a commutator on said weight carrying shaft, a contact finger cooperating with said com-

mutator and normally out of contact therewith, means for restoring said weight to its normal position after it has operated, said restoring means including a set of drive
 5 gearing, and a motor for driving the same, an electric motor operating circuit including said motor, said commutator and said contact finger therefor, a source of electric energy in said motor circuit, a switch hav-
 10 ing segments in said motor circuit to make and break the same, a lock and release magnet circuit including a source of electric energy and said lock and release magnet, said switch having segments for said lock and
 15 release magnet circuit, means for operating said switch to simultaneously open said lock and release magnet circuit and said motor operating circuit at said switch, to permit said weight to turn said weight carrying
 20 shaft and thereby turn said arm carrying shaft to project said arm in a direction across the right of way and simultaneously cause said motor operating circuit to be closed by said shaft carried commutator so that when said switch is again moved to its closed position said motor operating circuit and said lock and release magnet circuit will both be closed to cause said motor mechanism to restore said weight to its initial po-
 30 sition and simultaneously restore said arm into a position parallel to the right of way and also cause said shaft carried commutator to thereupon break said motor operating circuit.

35 6. A track stop comprising a casing, a shaft vertically mounted in said casing, a stop arm carried by said shaft, a driven shaft mounted in said casing, gear connections between said shafts, a main weight
 40 secured to said driven shaft to turn the same, an arm carried by said main weight, an auxiliary weight pivoted to said main weight, an arm projecting from said auxiliary weight, an armature carried by said
 45 last named arm and an electro-magnet carried by said first mentioned weight arm, means for energizing said magnet to hold said weight arms in parallel relation, said main weight having a slot, a link having a
 50 pin projecting through said slot and being pivotally mounted on said auxiliary weight, a master gear loose on said driven shaft, said master gear having pins to engage said link pin when said weight arms are in parallel
 55 relation, motor actuated drive gearing for turning said master gear and for holding said master gear from turning when said motor is inoperative.

7. A track stop comprising a casing, a
 60 shaft vertically mounted in said casing, an arm carried by said shaft, a driven shaft mounted in said casing, gear connections between said shafts, a main weight secured to said driven shaft to turn the same, an arm
 65 carried by said main weight, an auxiliary

weight pivoted to said main weight, an arm projecting from said auxiliary weight, an armature carried by said last named arm and an electro-magnet carried by said first mentioned weight arm, means for energiz-
 70 ing said magnet to hold said weight arms in parallel relation, said main weight having a slot, a link having a pin projecting through said slot and being pivotally mounted on said auxiliary weight, a master gear
 75 loose on said driven shaft, said master gear having pins to engage said link pin when said weight arms are in parallel relation, motor actuated drive gearing for turning said master gear and for holding said master gear from turning when said motor is in-
 80 operative, a commutator on said driven shaft, a contact maker normally out of contact with said commutator, and an electric motor operating circuit including said motor, said commutator and said contact finger and a source of electric energy, together with a switch device for making and break-
 85 ing said motor operating circuit independent of said commutator.

8. In a track stop, a support, an arm carrying shaft mounted vertically to turn in said support, a horizontal shaft mounted in said support, gear connections between said
 90 shafts, said gear connections being such that either shaft when turned will turn the other, a weight operatively connected with said horizontal shaft and tending to turn the same to a predetermined position, means normally holding said weight in a position
 95 ready to act and other means for restoring said weight to its ready to act position after it has been released and thereby restore said horizontal shaft and said arm carrying shaft to their original positions.

9. A track stop including a support, a horizontally oscillatable stop arm, a carrying shaft for said arm mounted in said support with said arm held in a primary position out of the clearance space of a right
 100 of way, a weight for turning said shaft to project said arm out of said primary position and into the clearance space, said shaft when said arm is projected out of its primary position being yieldable to turn subject to the inertia of said weight, means normally holding said weight in its primary position, said holding means including a slot device, and means for releasing said holding means to permit said weight to act.
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10. A track stop including a support, a horizontally oscillatable stop arm, a carrying shaft for said arm mounted in said support with said arm held in a primary position out of the clearance space of a right
 110 of way, a weight for turning said shaft to project said arm out of said primary position and into the clearance space, said shaft when said arm is projected out of its primary position being yieldable to turn sub-
 115 125 130

ject to the inertia of said weight, means normally holding said weight in its primary position, said holding means including a slot device, and means for releasing said holding means to permit said weight to act, and electrically controlled means for restoring the aforesaid parts to their normal positions.

11. A track stop including a support, a horizontally oscillatable stop arm, a carrying shaft for said arm mounted in said support with said arm held in a primary position out of the clearance space of a right of way, a weight for turning said shaft to project said arm out of said primary position and into the clearance space, said shaft when said arm is projected out of its primary position being yieldable to turn subject to the inertia of said weight, means normally holding said weight in its primary position, said holding means including a slot device, and means for releasing said holding means to permit said weight to act, motor operated devices for restoring the aforesaid parts to their primary positions, and controlling devices for said motor operated devices.

12. A track stop including a support, a horizontally oscillatable stop arm, a carrying shaft for said arm mounted in said support to hold said arm in a primary position out of the clearance space of a right of way, a weight for turning said shaft to project said arm out of said primary position into the clearance space, said shaft when said arm is projected out of its primary position, being yieldable to turn subject to the inertia of said weight, means normally holding said weight in a primary position, said holding means including a slot device and a holding magnet, and means for energizing said magnet.

13. A track stop including a support, a horizontally oscillatable stop arm, a carrying shaft for said arm mounted in said support to hold said arm in a primary position out of the clearance space of a right of way, a weight for turning said shaft to project said arm out of said primary position into the clearance space, said shaft when said arm is projected out of its primary position, being yieldable to turn subject to the inertia of said weight, means normally holding said weight in a primary position, said holding means including a slot device and a holding magnet, and means for energizing said magnet, and means for interrupting the energizing of said magnet to release said holding means and permit said weight to act.

14. A track stop including a support, a shaft mounted in said support, a train stop arm cooperating with said shaft and adapted to be projected into the clearance space of a right of way, a weight for turning said

shaft to move said stop arm from a position out of the clearance space of a right of way to a position where said arm will project into the clearance space, said shaft when in said latter position being yieldable to turn subject to the inertia of said weight, a motor operated restoring mechanism for restoring said weight to its primary position, said motor operated mechanism including a slot device connection with said weight, and means for controlling the operation of said slot device connection.

15. In a device of the class described, a support, a vertically held shaft rotatably mounted in said support, an arm carried by said shaft, a pivoted weight, and power transmitting connections between said weight and said shaft in virtue of which said weight will continuously tend to maintain said shaft in a particular position, means for holding said weight in a position with its center of gravity to one side of its pivot, means for releasing said holding means to permit said weight to move and turn said shaft, and other means cooperative with the aforesaid parts for returning said weight to its former position.

16. In a device of the class described a support, a vertically held shaft rotatably mounted in said support, an arm carried by said shaft, a pivoted weight, power transmitting connections between said weight and said shaft in virtue of which said weight will continuously tend to turn said shaft, said shaft being free to oscillate subject to the inertia of said weight, means for holding said weight in a position with its center of gravity to one side of its pivot, means for releasing said holding means to permit said weight to move and turn said shaft, said weight being adapted to oscillate and thereby move its center of gravity from one side to the other of its pivot and vice versa, and other means cooperative with the aforesaid parts for returning said weight to its initial position.

17. A track stop including a support, a horizontally oscillatable stop arm, a carrying shaft for said arm mounted in said support with said arm held in a primary position, a weight for turning said shaft to project said arm out of said primary position and into a secondary position, said shaft when said arm is projected out of its primary position being yieldable to turn subject to the inertia of said weight, means normally holding said weight in its primary position, said holding means including a slot device, and means for releasing said holding means to permit said weight to act.

18. A track stop including a support, a horizontally oscillatable stop arm, a carrying shaft for said arm mounted in said support with said arm held in a primary position, a weight for turning said shaft to pro-

ject said arm out of said primary position and into a secondary position, said shaft when said arm is projected out of its primary position being yieldable to turn subject to the inertia of said weight, means normally holding said weight in its primary position, said holding means including a slot device, and means for releasing said holding means to permit said weight to act, and means for restoring the aforesaid parts to their primary positions. 10

JEAN F. WEBB, JR.

Witnesses:

JEAN F. WEBB, Sr.,

R. W. GUNTHER.