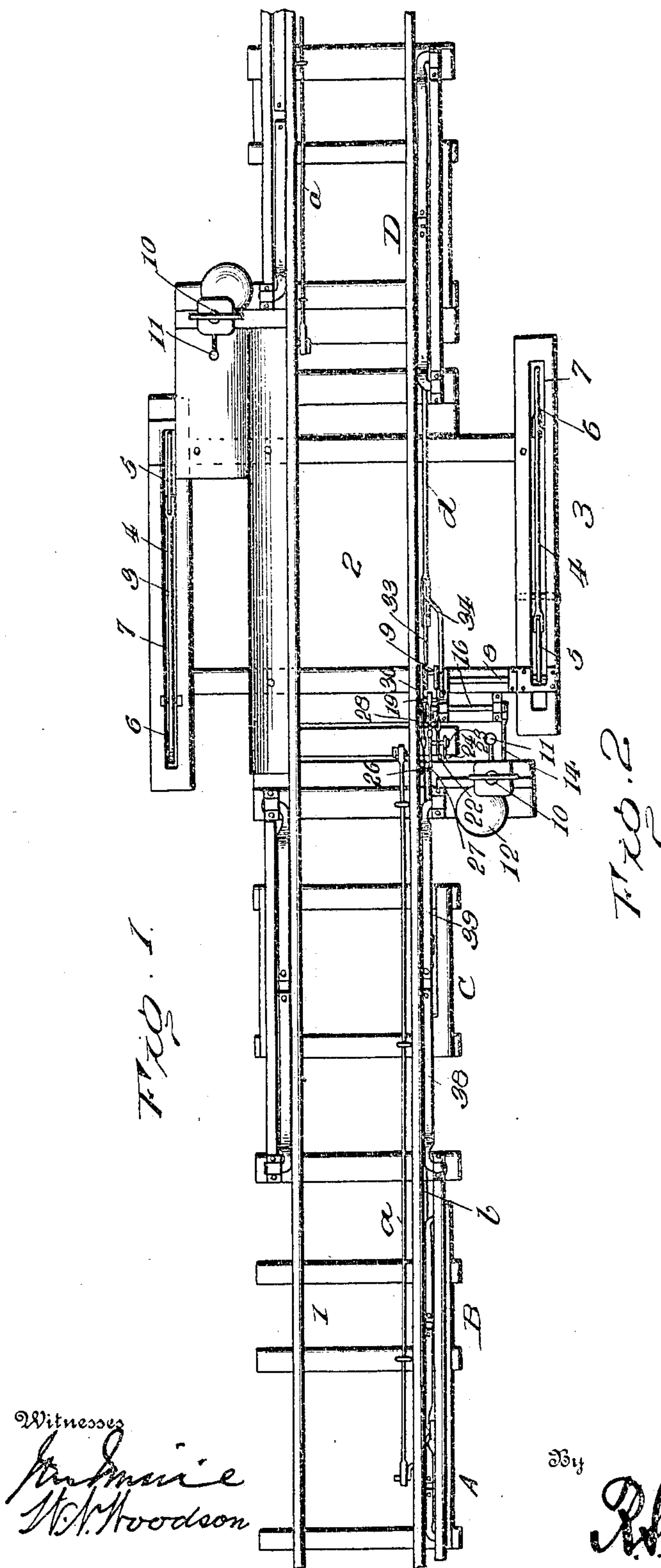


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PATENTED APR. 25, 1905.

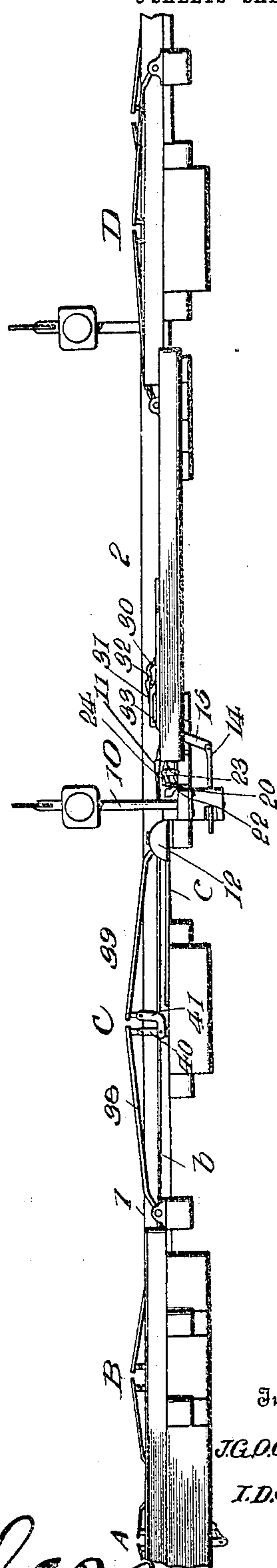
J. G. O. & I. D. COMBS.  
RAILWAY SIGNAL AND GATE.  
APPLICATION FILED NOV. 19, 1904.

3 SHEETS—SHEET 1.



Witnesses

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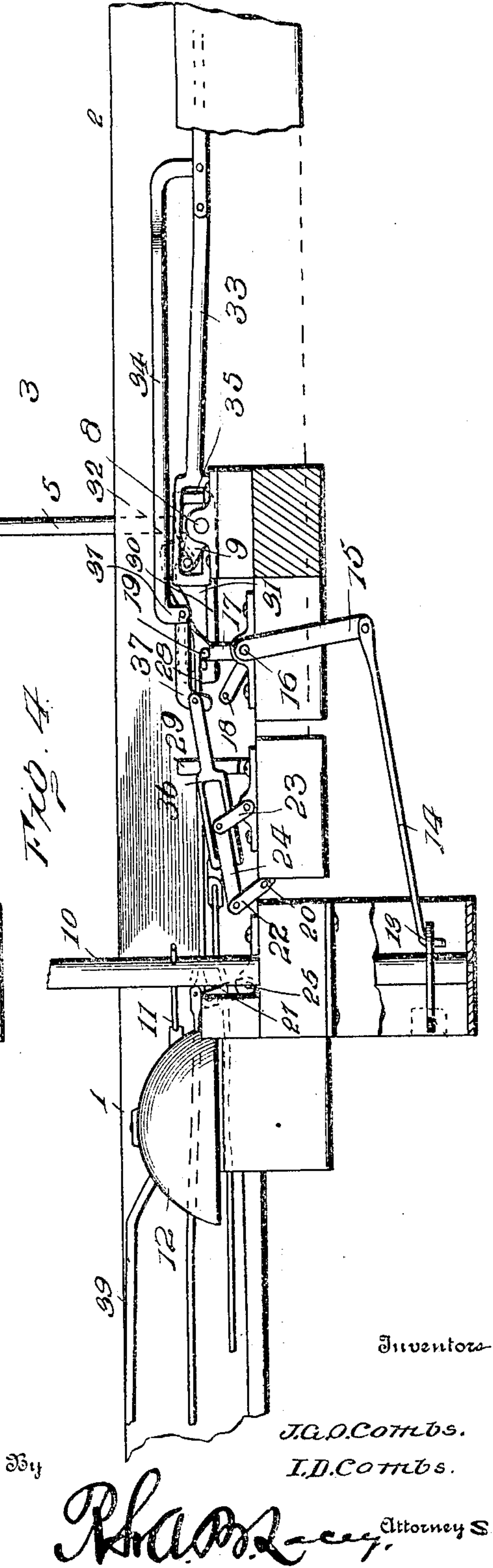
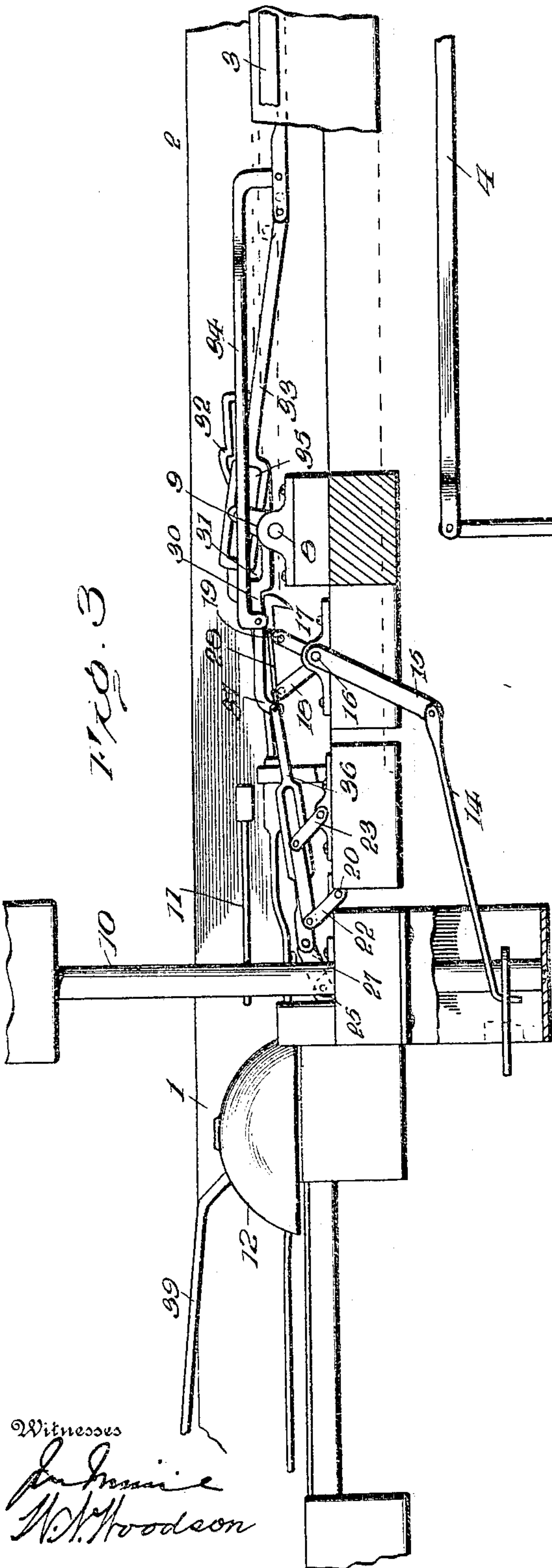
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3 SHEETS—SHEET 2.





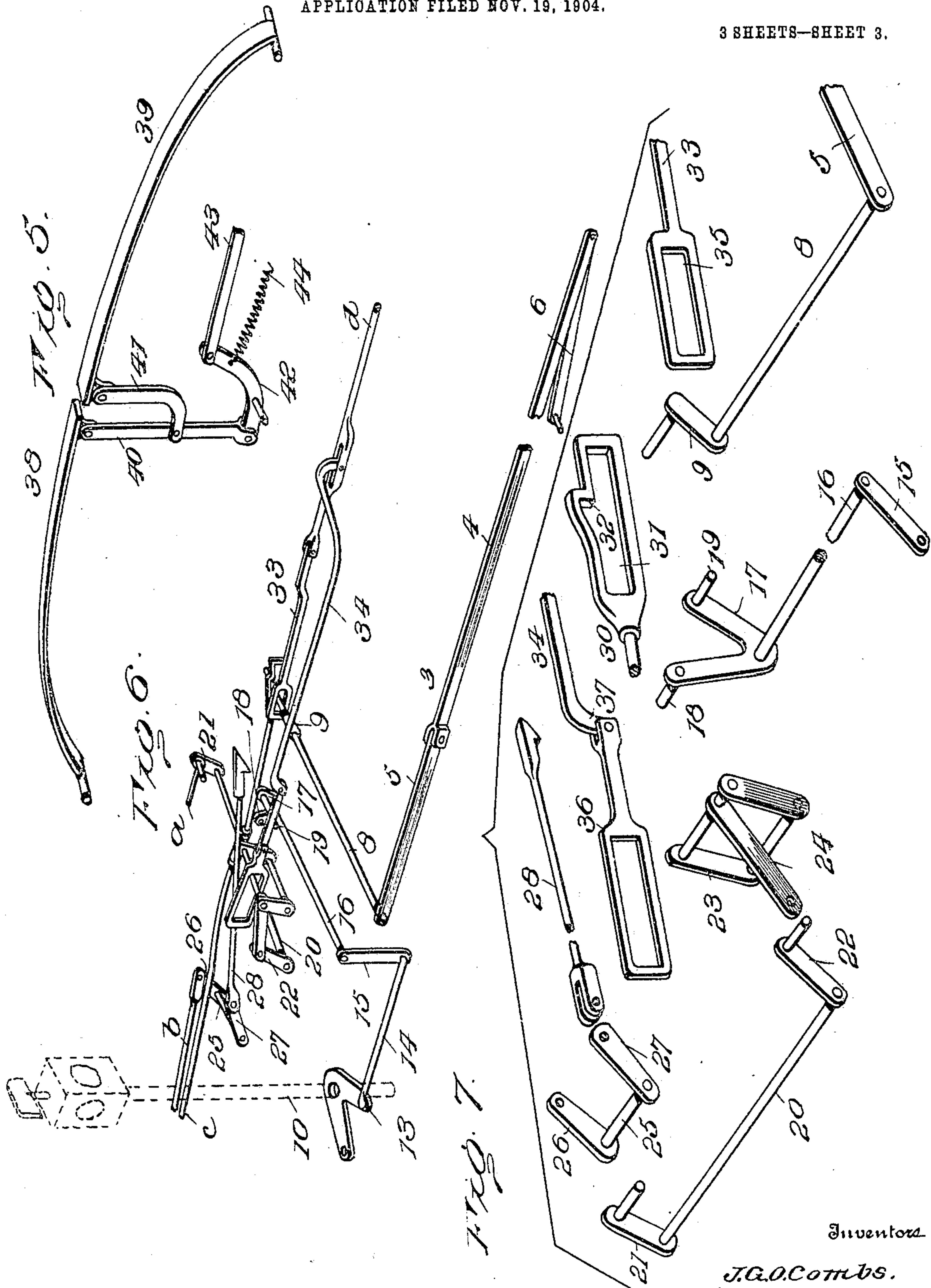
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3 SHEETS—SHEET 3.



Witnesses

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# UNITED STATES PATENT OFFICE.

JAMES G. O. COMBS AND ISAAC D. COMBS, OF HAROLD, MISSOURI.

## RAILWAY SIGNAL AND GATE.

SPECIFICATION forming part of Letters Patent No. 787,895, dated April 25, 1905.

Application filed November 19, 1904. Serial No. 233,455.

*To all whom it may concern:*

Be it known that we, JAMES G. O. COMBS and ISAAC D. COMBS, citizens of the United States, residing at Harold, in the county of Greene and State of Missouri, have invented certain new and useful Improvements in Railway Signals and Gates, of which the following is a specification.

This invention relates to appurtenances used in connection with railways at crossings or other dangerous places where warning is required to be given of the approach of a train and a barrier utilized to prevent persons or animals from crossing the track.

The machine embodies audible and visual signals, a gate, and novel actuating and resetting means. To prevent accidental operation of the signal mechanism, two trips and adjunctive parts are employed, one trip when moved serving to throw the signal-operating mechanism into effective or working position and designated hereinafter as the "signal-setting" trip and the other trip when actuated serving to move the signal-operating mechanism and distinguished hereinafter as the "signal-operating" trip. A third trip, qualified by the expression "gate-operating" trip, is connected with the gate and when operated by the operating-train throws the gate across the roadway. The parts are returned to a normal position by a "resetting-trip" operated by the train after passing the crossing or danger-point guarded by the signal.

For a full description of the invention and the merits thereof and also to acquire a knowledge of the details of construction of the means for effecting the result reference is to be had to the following description and accompanying drawings.

While the invention may be adapted to different forms and conditions by changes in the structure and minor details without departing from the spirit or essential features thereof, still the preferred embodiment thereof is shown in the accompanying drawings, in which—

Figure 1 is a top plan view of a railway-crossing equipped with signal and gate mechanisms constructed in accordance with and embodying the essential features of this in-

vention. Fig. 2 is a side view of the parts illustrated in Fig. 1. Fig. 3 is a detail view in elevation of the operating mechanism, on a larger scale, showing the relation of the parts after the signal-setting trip has been actuated. Fig. 4 is a view of the parts illustrated in Fig. 3, showing their relative arrangement after the signal and gate operating trips have been actuated. Fig. 5 is a detail perspective view of one of the trips. Fig. 6 is a detail perspective view of the operating mechanism, showing the normal position of the coöperating elements. Fig. 7 is a detail view in perspective of the operating mechanism, the several elements being separate and arranged in a group.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

It is to be understood that the invention is adapted for single or double tracks and for any system of railway required to be safeguarded at a crossing or other dangerous points. When applied to a single track, the mechanism is duplicated and preferably arranged upon opposite sides of the track, so that a train passing in one direction will operate one signal and gate only and a train passing in the opposite direction will actuate the other signal and gate. For double tracks each will be applied at the point to be protected with a signal and gate. It is to be further understood that the working parts are to be suitably housed to protect them from the weather and from being injured by animals and vehicles passing thereover.

Figs. 1 and 2 of the drawings show the invention applied to a single track, the parts being duplicated at each side thereof and arranged so that a train approaching from one direction will actuate one mechanism and a train moving in the opposite direction will move the other mechanism. Inasmuch as the mechanisms are duplicated a detailed description of one only will be given.

The track is indicated by the reference-numeral 1, and the crossing by the reference-numeral 2. A gate 3 is located at one side of the track, so as to obstruct the crossing when



thrown into operative position. This gate may be of any usual type commonly employed for protecting railway-crossings; but the construction illustrated is preferred because of its simplicity and ease of operation. As shown, the gate comprises a bar 4 and arms 5 and 6 and is adapted to fold into a pocket 7, provided in the roadway adjacent to the crossing. The arms 5 and 6 have pivotal connection with opposite ends of the bar 4. The arm 5 is connected to a rock-shaft 8, so as to move therewith, said rock-shaft being journaled in bearings applied to an extension of a tie or to any suitable framework. The inner end of the rock-shaft is provided with a crank-arm 9, to which the power is applied for opening and closing the gate.

A signal is arranged at the crossing or other point requiring to be protected and is of the audible and visual type, the visual signal comprising a lantern to give warning by night and a semaphore to indicate danger by day. A post 10 carries the visual signal and a hammer 11 of the audible signal, said hammer being adapted to strike a gong-bell 12 when the post 10 is turned to give warning of impending danger. A crank 13, secured to the lower end portion of the post 10, is coupled, by means of a link or connection 14, to a crank-arm 15 at the outer end of a rock-shaft 16, journaled parallel with the rock-shaft 8 and provided at its inner end with a bell-crank 17, from the arms of which project pins 18 and 19 in diametrically opposite directions. When the rock-shaft 16 is turned in one direction, the signal is moved to indicate danger, and when turned in the opposite direction the signal is moved to "safety."

A rock-shaft 20 is arranged parallel with the rock-shafts 8 and 16 and is provided at opposite ends with crank-arms 21 and 22, the former being coupled to the signal-setting trip A by means of a rod, wire, or like connection *a*. The signal-setting trip A is located along the track at any determinate distance from the crossing, so as to be actuated by the approaching train in ample time to throw the signal-operating mechanism into condition for positive movement when actuated. The trip may be of any construction and arranged so as to be operated by any part of the moving train. A lifter 23 is provided for normally holding the signal-operating mechanism out of gear and may be of any formation so long as it subserves the intended purpose. As depicted, the lifter 23 is of link form, comprising side bars and horizontal rods. A link or link connection 24 couples the upper end of the lifter to the crank-arm 22, whereby movement of the rock-shaft 20 results in a corresponding movement of said lifter. A rock-shaft 25, provided at opposite ends with crank-arms 26 and 27, parallels the other rock-shafts and has its crank-arm 26 coupled to the signal-operating trip B by means of a rod,

wire, or analogous connection *b*. A dog 28 is pivotally connected to the crank-arm 27 and under normal conditions is held out of action by means of the lifter 23 by resting upon the upper rod or portion thereof. A guide 29 prevents vertical or lateral displacement of the dog 28, yet admits of a limited vertical and longitudinal movement thereof. The hooked end of the dog 28 overhangs the pin 19 of the bell-crank 17 and normally is held sufficiently elevated therefrom by means of the lifter 23 to prevent operation of the rock-shaft 16, even though the trip B should be actuated or the connection *b* drawn upon. However, when a train is approaching the crossing and actuates the signal-setting trip A the lifter 23 is moved to a position to admit of the dog 28 lowering at its hooked end, so as to rest upon the pins 19, thereby throwing the signal-operating mechanism into gear. As the train in its onward movement actuates the signal-operating trip B the shaft 25 is rocked and the dog 28 moved, and its hooked end, coming in contact with the pin 19, rocks the shaft 16 and sounds the audible signal and throws the visual signal into position to give warning of the approaching of the train. When the train actuates the gate-operating trip C, the shaft 8 is rocked and the gate projected across the roadway, as indicated most clearly in Fig. 4.

A rod, wire, or like connection *c* couples the trip C to a link 30, having an end portion provided with a longitudinal slot 31 to receive the arm of crank 9. The link 30 is pivotally connected to the connection *c* and rests upon the pin 18, and the upper edge of its slotted portion 31 is provided with a shoulder 32, intermediate of its ends, to engage with the pin 18 and rock the shaft 8 and throw the gate into operative position. So long as the rock-shaft 16 occupies a normal position, the link 30 will be held out of action, thereby preventing operation of the gate by actuation of the gate-operating trip C. When, however, the rock-shaft 16 has been operated, the pin 18 is lowered, thereby permitting the slotted end of the link 30 to descend and rest upon the pin 18, and upon actuation of the gate-operating trip C the shoulder 32, coming in contact with the arm of the crank 9, rocks the shaft 8 and throws the gate into position across the roadway.

The resetting-trip D is arranged some distance from the crossing, and a rod, wire, or like connection *d*, coupled thereto, has links 33 and 34 pivotally connected thereto, the link 33 having a slotted end 35 to receive the arm of the crank 9 and the link 34 having a slotted member 36 pivotally connected thereto and receiving the upper rod or portion of the lifter 23. After the train has passed by the crossing and actuates the resetting-trip D the links 33 and 34 are drawn upon and lock the shafts 8, 16, and 25 in an opposite



direction, thereby returning the parts to a normal position. The link 34 rests upon the pin 19 of the bell-crank 17 and is provided with a hook 37, so disposed that when the re-  
 5 setting-trip is actuated the shoulder 37 will come in contact with the pin 19 and effect an oscillatory movement of the bell-crank 17 and a locking of the shaft 16.

Within the purview of the invention the  
 10 several trips may be of any construction and arrangement so as to be operated by the moving train. However, it is preferred to have them of approximately uniform structure and substantially of the form shown in Fig. 5,  
 15 which illustrates each of the trips as consisting of oppositely-disposed pivoted bars 38 and 39, having their outer end portions downwardly deflected, said bars being arranged adjacent to a rail of the track with their pivotal  
 20 ends below the tread thereof, their inner ends slightly elevated, so as to be depressed by the wheels of the cars passing thereover. Links 40 and 41 are pivotally connected at their upper ends to pendent lugs at the inner ends of  
 25 the pivoted bars, the lower end portion of one of the links, as 41, being curved toward the link 40 and pivoted thereto, whereas the link 40 is extended below its point of connection with the link 41 and is connected to  
 30 one end of a lever 42, the opposite end portion of which is coupled to a connecting-rod 43, which may be either one of the rods *a*, *b*, *c*, or *d*. A spring 44 is connected to the lever 42 for returning the bars to a normal po-  
 35 sition when relieved of the pressure of the car-wheels.

Having thus described the invention, what is claimed as new is—

1. In safety appliance for railways, the com-  
 40 bination of a signal, operating mechanism therefor comprising elements normally disengaged, a trip adapted to be actuated by an approaching train for throwing the said disengaged parts into engaging position, and a sec-  
 45 ond trip normally in position to be moved by the train to effect operation of the signal-actuating mechanism after the disengaged parts have been thrown into operative position for operating the signal to give warning of im-  
 50 pending danger.

2. In safety appliance for railways, the combination of a signal, operating mechanism therefor comprising parts normally disengaged, a gate, gate-operating mechanism com-  
 55 prising parts normally disengaged, a trip for throwing the disengaged parts of the signal-operating mechanism into engaging position, a second trip for operating the signal and bringing the disengaged parts of the gate-  
 60 operating mechanism into engaging position, and a third trip for actuating the gate.

3. In safety appliance for railways, the combination of a signal, operating mechanism therefor, a gate, gate-operating mechanism  
 65 normally out of action, a trip operatively con-

nected with the signal-operating mechanism for actuating the same, means actuated by the signal-operating mechanism to throw the gate-operating mechanism into gear or working position, a trip for projecting the gate across  
 70 the roadway.

4. In safety appliance for railways, the combination of a signal, operating mechanism therefor comprising elements normally out of action, a gate, operating mechanism therefor  
 75 normally out of action, a signal-setting trip for throwing the signal-operating mechanism into gear, a signal-operating trip for actuating the signal-operating mechanism, means actuated by the signal-operating mechanism  
 80 to throw the gate-operating mechanism into working position, and a gate-operating trip for actuating the gate-operating mechanism.

5. In safety appliance for railways, the combination of a signal, operating mechanism  
 85 therefor comprising elements normally out of action, a gate, operating mechanism therefor normally out of action, a signal-setting trip for throwing the signal-operating mechanism into gear, a signal-operating trip for actuat-  
 90 ing the signal-operating mechanism, means actuated by the signal-operating mechanism to throw the gate-operating mechanism into working position, a gate-operating trip for actuating the gate-operating mechanism, a re-  
 95 setting-trip, and independent connections between the resetting-trip and the signal and gate operating mechanism for restoring the working parts to a normal position.

6. In combination, a signal, operating mech-  
 100 anism therefor comprising cooperating suitable elements, a lifter normally holding said elements separated and out of action, a trip connected with the lifter to effect movement thereof to permit the aforesaid separable ele-  
 105 ments to come into working condition, and a second trip connected with one of the aforesaid separable elements for actuating it and the signal-operating mechanism, substantially  
 110 as set forth.

7. In combination, a signal, operating mechanism therefor comprising cooperating separable parts, a pivoted lifter normally holding  
 115 said parts separated, a trip connected with said lifter for operating it to permit said separable parts to come into working position, and a second trip connected with one of said separable elements to impart movement thereto and to the signaling-operating mechanism, substantially  
 120 as set forth.

8. In combination, a signal, operating mechanism therefor comprising cooperating separable parts, a pivoted lifter normally holding  
 125 said parts separated, a trip connected with said lifter for operating it to permit said separable parts to come into working position, a second trip connected with one of said separable elements to impart movement thereto and to the signaling-operating mechanism, a  
 130 resetting-trip, and a loose connection between



said resetting-trip and the said lifter for restoring the parts to normal position.

9. In combination, a signal, operating mechanism therefor comprising cooperating elements normally separated, a gate, operating means therefor normally held out of action by the signal-operating mechanism, a trip for throwing the parts of the signal mechanism into gear, a second trip for actuating the signal-operating mechanism and throwing the gate-operating mechanism into gear, and a third trip for actuating the gate-operating mechanism.

10. In combination, a signal, operating mechanism therefor comprising cooperating elements normally separated, a gate, operating means therefor normally held out of action by the signal-operating mechanism, a trip for throwing the parts of the signal mechanism into gear, a second trip for actuating the signal-operating and throwing the gate-operating mechanism into gear, a third trip for actuating the gate-operating mechanism, a fourth trip, independent connections between the fourth trip and the gate, and signal-operating mechanisms for restoring the individual parts to normal position, substantially as set forth.

11. In combination, a signal, a rock-shaft connected with the signal and having a crank portion, a dog normally extended across the path of said crank portion, a trip connected with said dog, a lifter normally holding said dog away from the aforesaid crank portion of the rock-shaft, and a trip for actuating said lifter to permit the dog to assume a position for imparting movement to said rock-shaft when the dog is actuated, substantially as set forth.

12. In combination, a signal, a rock-shaft connected with the signal and having a crank portion, a dog normally extended across the path of said crank portion, a trip connected with said dog, a lifter normally holding said dog away from the aforesaid crank portion of the rock-shaft, a trip for actuating said lifter to permit the dog to assume a position for imparting movement to said rock-shaft when the dog is actuated, a resetting-trip, a connection between the resetting-trip and the crank portion of the rock-shaft, and a coupling member between said connection and lifter for restoring the said parts to normal

position upon actuation of the resetting-trip, substantially as set forth.

13. In combination, a signal, a rock-shaft connected thereto and having oppositely-extended crank portions, a dog normally extended across the path of one of said crank portions, a lifter normally holding said dog out of engagement with its cooperating crank portion, a gate, a rock-shaft for actuating the gate and having a crank portion, a link cooperating with the gate-operating rock-shaft and normally resting upon the other crank portion of the signal-operating rock-shaft, and a series of independent trips for successively operating the lifter, the signal-operating mechanism and the gate-actuating means, substantially as set forth.

14. In combination, a signal, a rock-shaft connected thereto and having oppositely-extended crank portions, a dog normally extended across the path of one of said crank portions, a lifter normally holding said dog out of engagement with its cooperating crank portion, a gate, a rock-shaft for actuating the gate and having a crank portion, a link cooperating with the gate-operating rock-shaft and normally resting upon the other crank portion of the signal-operating rock-shaft, a series of independent trips for successively operating the lifter, the signal-operating mechanism and the gate-actuating means, and a resetting-trip having independent connection with crank portion of the signal and gate operating rock-shaft and with the lifter, substantially as set forth.

15. In railway safety appliance, the combination of a safeguard, actuating means therefor, and a trip, the latter comprising oppositely-disposed pivoted bars, links pendent from the inner ends of said bars and pivotally connected, a lever forming connecting means between one of said links and the rod for transmitting motion to the operating means of the safeguard, substantially as set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

JAMES G. O. COMBS.  
ISAAC D. COMBS.

Witnesses:

J. Z. TAYLOR,  
S. S. BROWN.