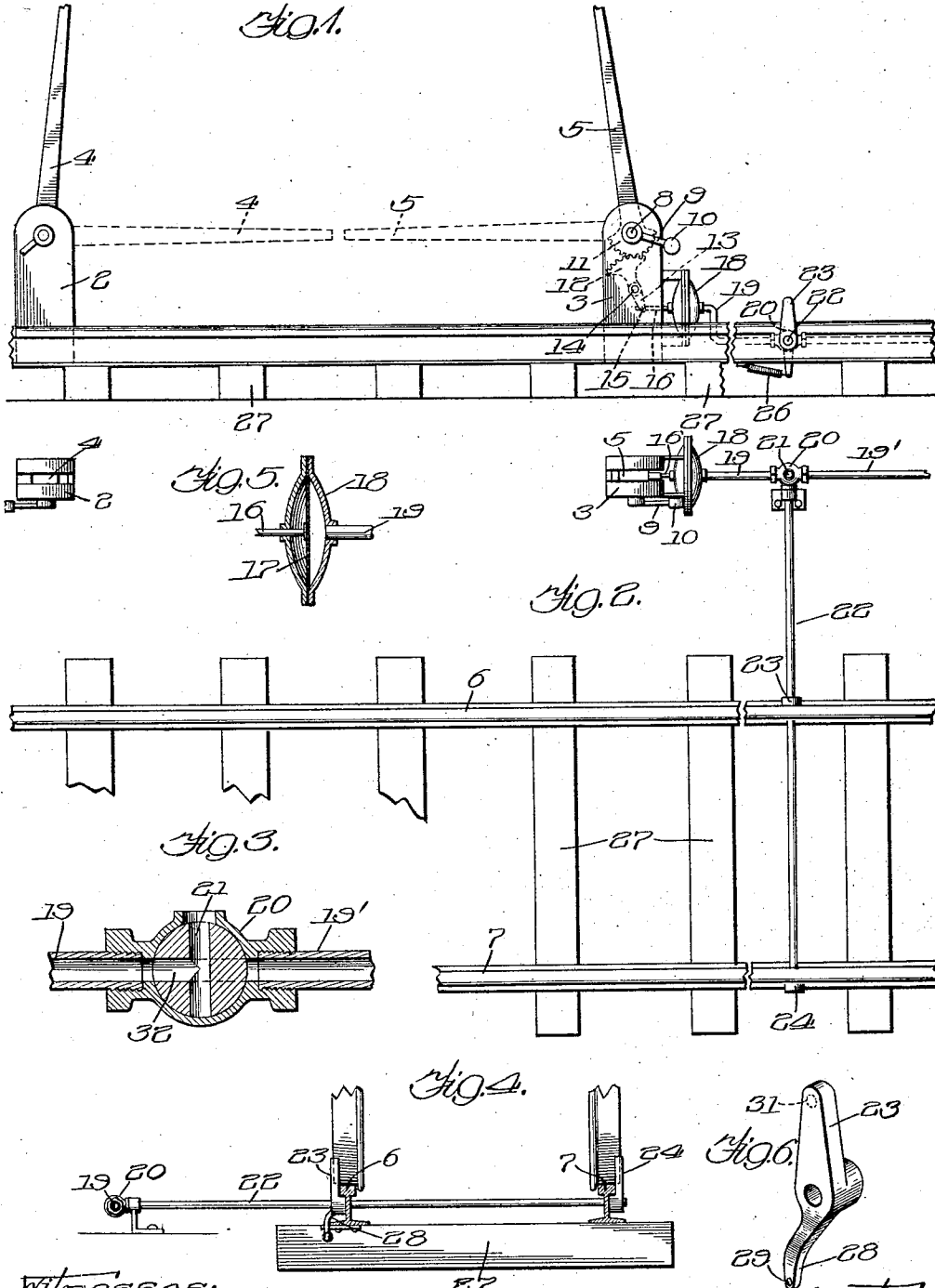


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CROSSING GATE.
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1,024,899.

Patented Apr. 30, 1912.



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UNITED STATES PATENT OFFICE.

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CROSSING-GATE.

1,024,899.

Specification of Letters Patent.

Patented Apr. 30, 1912.

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To all whom it may concern:

Be it known that I, IENS CHREST JOHNSON, a citizen of the United States, residing at Tonica, county of Lasalle, and State of Illinois, have invented certain new and useful Improvements in Crossing-Gates, of which the following is a specification.

My invention relates to crossing gates and has particular reference to automatic operation thereof.

The object of the invention is to provide crossing gates which shall be operated in an improved manner by engine, car, motor or other vehicle following a track, and the invention consists in the combination with crossing gates of the improved method hereinafter described for operating them automatically.

The invention further consists in yielding operating means which prevent a too sudden opening or closing of the gates and in means for setting up vibratory movements in the closed gates to attract the attention of wayfarers or to employ the gates as movable flag arms.

The invention will be more readily understood by reference to the accompanying drawing, in which—

Figure 1 is a side elevation of a track, crossing gates and my invention applied thereto, the invention being illustrated with only one pair of tracks of a double track road. Fig. 2 is a plan view thereof. Fig. 3 is an enlarged detail view representing a three-way valve controlling the diaphragm-operating fluid. Fig. 4 is a cross-section of the track and sections of car-wheels showing the manner in which the contacts take place. Fig. 5 is a view of the diaphragm and case. Fig. 6 is a perspective view of one of the wheel-contact toes or levers.

In the several views, 2 and 3 represent a usual form of post or standard for arms or crossing gates 4 and 5, respectively.

6 and 7 are the rails of a car-track alongside of which at a suitable distance from it are placed the arms or gates 4 and 5 and their immediate equipment.

Referring to the mechanism connected with the arm 5 in Figs. 1 and 2, which may be duplicated for the arm 4, or the latter may be connected to move synchronously with the arm 5 in any approved or prevailing manner, 8 is the pivot or rock-shaft of the arm 5, and to the arm, if it is free to rotate on the shaft, or on the shaft 8 if it

is keyed to the arm, is secured a counterbalance arm 9 carrying a counterbalance weight 10 normally tending to hold the arm in its raised or open position as it is shown in full lines in Fig. 1. At its pivoted end the arm or gate 5 is provided with a gear-segment 11, meshing with a similar segment 12 on an arm 13 fulcrumed at 14 and having its power-end pivoted at 15 to a rod 16 connected with and operated by a diaphragm 17 in the diaphragm-case or shell 18 which is shown in Fig. 2 as placed a little distance to one side of the track and in line with the crossing gate or arm standards. The side of the diaphragm opposite to that connected with the rod 16 is connected with a compressed air or steam pipe 19, the flow through which is controlled by a valve 20 shown on an enlarged scale in Fig. 3. This valve is interposed between sections 19 and 19' of the steam or air-pipe and has a bore, passage or opening 21 therein which is rotatable into alinement with the sections 19 and 19' to open one to the other or to admit steam or compressed air from the pipe-section 19' into the section 19 and thence to the right-hand side of the diaphragm to force the latter into the left-hand side of the diaphragm-chamber in the casing 18. The valve 20, in turn, is rotated in the manner stated by a shaft 22 and the latter is operated by a pair of contact-toes or levers 23 and 24 pivoted as at 25 to the side of each rail, preferably the outer side, as the wheel-tread is usually so much wider than the head of the rail that contact can be effected at either one or the other side of the track with the periphery of the wheel itself rather than its flange. The lever may in each instance be placed on the inside of each rail, if preferred, so as to cause the wheel flange to contact with it, but I prefer the arrangement shown where that is practicable.

Referring to Figs. 1 and 6, the lever or toe is held in a vertical position, or as shown, by a spring 26 connected at one end with a suitable stationary part such as a track-tie 27 and at the opposite end said spring is connected with a downwardly projecting arm 28 provided with a hole 29 for that purpose.

When the lever 24, or its companion 23 or both, are depressed or swung into horizontal position by the car wheel striking and passing over it steam or compressed air will be admitted to the diaphragm and the pressure

will gradually lower the arm. This lowering of the arm will be accomplished by a series of steps. The tension of the spring 26 will be made considerably less than the force of the car-wheels applied to the levers 23 and 24, or sufficient to slowly return the diaphragm, whereas the force applied to the levers by the car-wheels will be powerful giving an impetus to the downward movement of the arm which will be but slightly overcome by the slowly returning diaphragm, if at all, by the time the lever or levers receives or receive the next blow from the next car-wheel. Furthermore the valve admitting the fluid to the diaphragm will be kept open with substantial continuity, at least partially, on account of the short intermission between the blows from the car-wheels under any but a very slow movement of the train. If the train moves so very slowly as to permit the arm to return after each blow there would probably be no need of placing the arm across the road and its mere agitation would, no doubt, be sufficient warning. The tendency of the lever 24 to fly back, due to its spring-tension, will cause it to vibrate rapidly as the wheels of a car and successive cars pass over, or in other words, cause interruptions in the pressure of the current. This will cause the arms 4 and 5 to swing up and down to a slight extent, but not sufficient to reach the vertical or open position. This closing of the gates and signaling will be timed properly by placing the toes or levers 23 and 24 a sufficient distance up the track to enable the train to close the gates or arms by its forward end early enough before the crossing is reached to enable a person on the track to reach safety.

For the purpose of closing the gates the valve 20 is provided with a relief port 32

communicating with the passage 21. This port, when the valve is closed, is normally open to the pipe section 19, or to the diaphragm side, and permits the steam or air to escape from the diaphragm casing. The port 32 may be made of a size to make the escape of such steam or air either slow or rapid, or to retard the opening movement so that after a train has passed over the toes or levers 23 and 24 the arms or gates 4 and 5 will not be raised until the train is at or over the crossing, even though the valve mechanism and its car wheel operated levers are placed an unusual distance from the crossing.

Having thus described my invention I claim as new and desire to secure by Letters Patent—

1. The combination with swinging crossing gates or arms of a contact-lever or toe to be operated by the wheel of a car or vehicle, pneumatic means to be controlled by said toe or lever and connected with said gates or arms, said means causing vibratory or up and down movements in said gates or arms while closing and while in substantially closed position.

2. The combination with the crossing gate or arm, of a mechanism for swinging same between open and closed positions, said mechanism being operable by a passing car to close said gate or arm and vibrate same in its closed position, and to automatically restore said gate or arm to its normally open or raised position.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

IENS CHREST JOHNSON.

Witnesses:

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