July 7, 1925. 1,545,231

C. W. BUTTRICK

GATE EQUIPMENT FOR RAILWAYS

Original Filed April 17, 1922 2 Sheets-Sheet 1

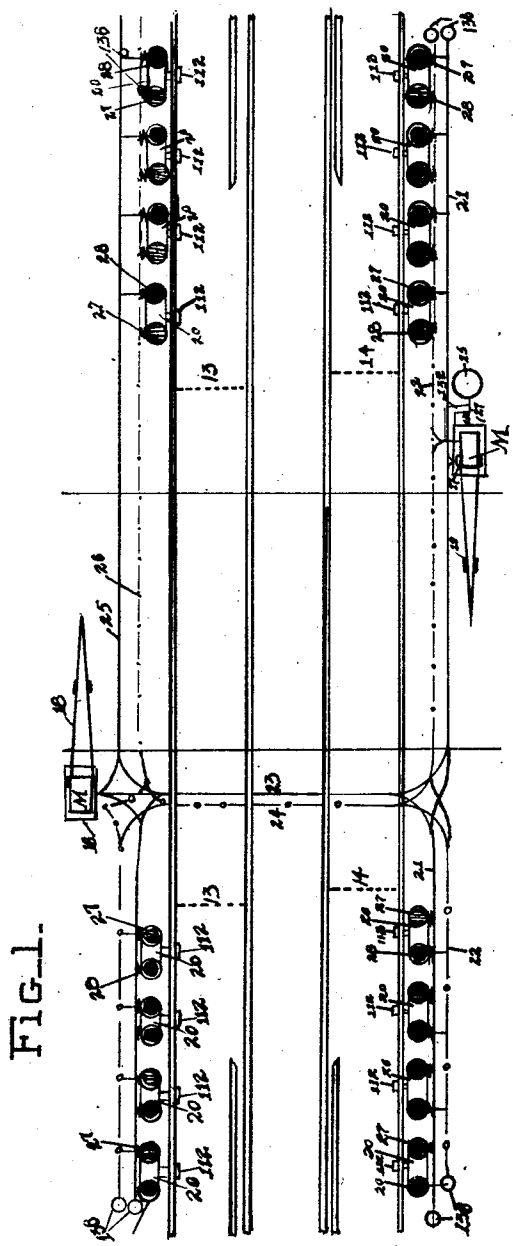


Fig. 1.

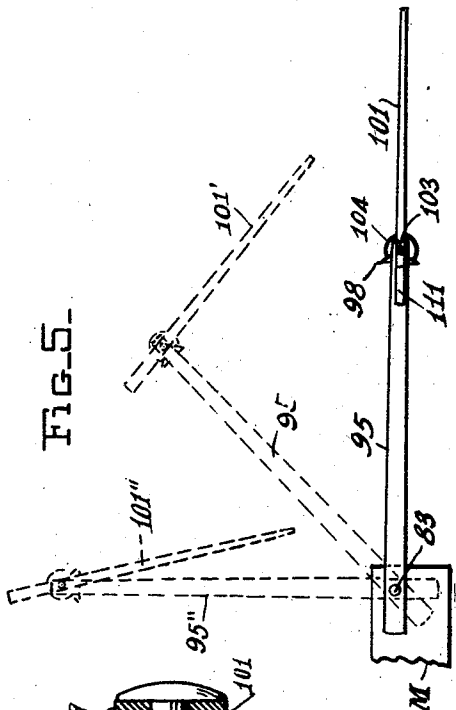


Fig. 5.

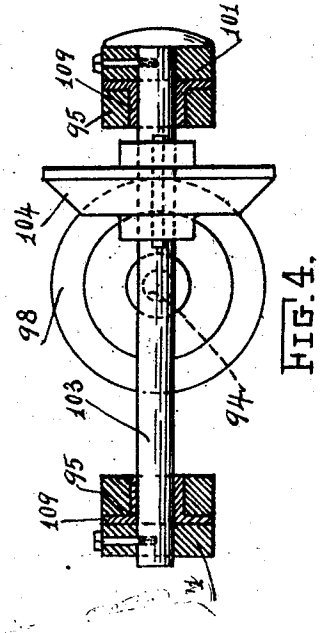


Fig. 4.

Witnesses.
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GATE EQUIPMENT FOR RAILWAYS

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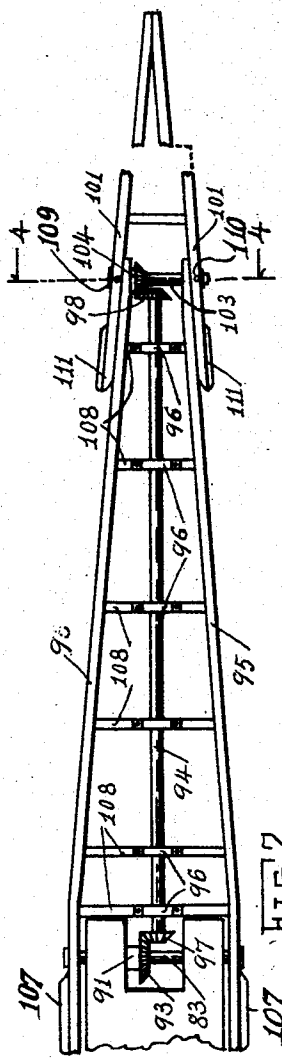


FIG. 6.

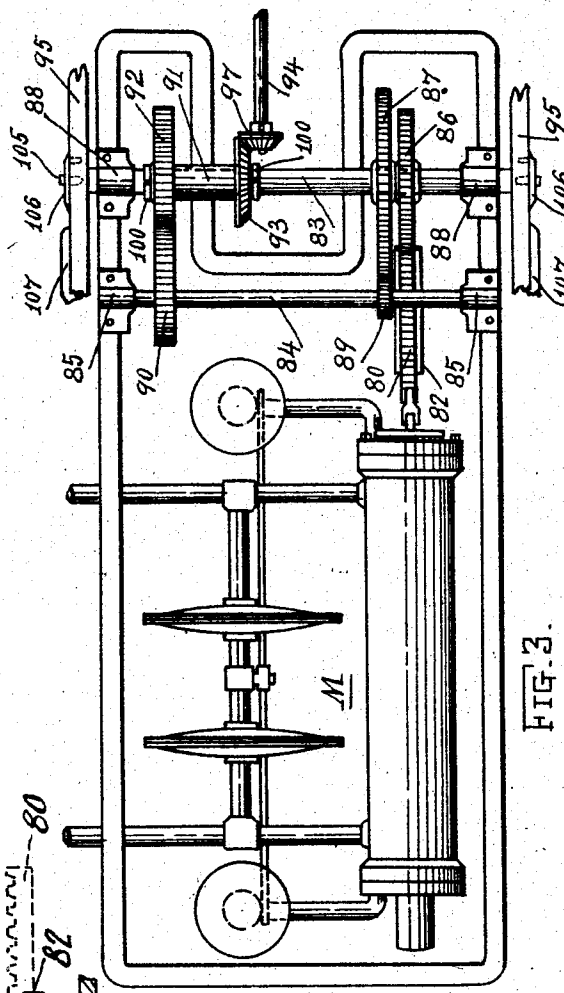


FIG. 3.

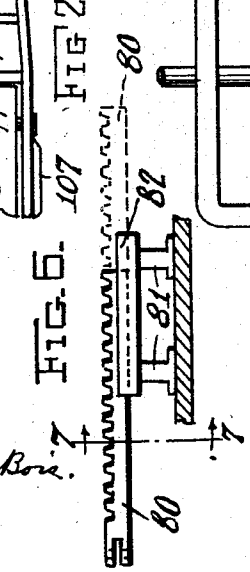


FIG. 2

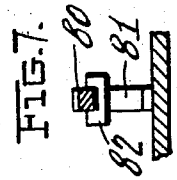


FIG. 7.

WITNESSES

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Patented July 7, 1925. 1,545,231.

UNITED STATES PATENT OFFICE.

CHARLES W. BUTTRICK, OF SPRINGFIELD, ILLINOIS.

GATE EQUIPMENT FOR RAILWAYS.

Original application filed April 17, 1922, Serial No. 553,623. Divided and this application filed September 24, 1923. Serial No. 664,537.

To all whom it may concern:

Be it known that I, CHARLES W. BUTTRICK, a citizen of the United States, residing at Springfield, in the county of Sangamon and State of Illinois, have invented a new and useful Gate Equipment for Railways, of which the following is a specification.

The invention relates to railway gate equipments such as are installed at plates where the railway crosses streets or roads, to prevent travelers on the street or road from attempting to cross the tracks when a train is approaching the crossing, either going or coming.

The objects of the invention are to provide extensible gates of improved construction, and effective means for lowering, extending and raising the gate, at variable speed across the road or street, crossing the track; and to provide other improved structural details.

I attain these objects by the mechanism illustrated in the accompanying drawings in which—

Figure 1 is a diagrammatic plan of a railway gate equipment embodying my invention;

Fig. 2 is an enlarged top plan of the extended gate;

Fig. 3 is an enlarged top plan of the motor and the train of gears used to lower and extend and raise the gate;

Fig. 4 is an enlarged transverse section through the gate, taken on the line 4—4 of Fig. 2;

Fig. 5 is a diagrammatic side view showing the closed or extended gate in full lines, also showing, in broken lines, the upright or open position of the gate and an intermediate position of the gate;

Fig. 6 is a diagrammatic side view of one channel bar; and one rack bar actuated by the motor and slidable in the channel of the channel bar to actuate the main train of gears inside one gate stand; and Fig. 7 is a vertical transverse section taken on the line 7—7, of Fig. 6. The same reference numerals designate the same parts in all the views. This application is a division of my application for patent on railway gate equipment, filed April 17th, 1922, Serial Number 533,623.

I have shown, in Fig. 1 of the drawings, a gate stand 16 outside the track rails 13; and a gate stand 17 outside the track rails 14. I have also shown conventionally a reservoir 15 containing a supply of oil under pressure; pipe lines 21 and 22 alongside the track 14 and communicating with the reservoir 15; motors M; pump-units 27 and 28; air domes 136; pipe lines 25 and 26 alongside the track 13, and pump units adjacent to the track 14 and served by the pipe lines 21 and 22. The gates 18 and 19 are operated by the respective motors M. Lateral lines 23 and 24 connect the pipe lines. Two series of pump units 20 are adjacent to the respective tracks 13 and 14. Each series comprises a number of double pumps and a number of wheel-actuated levers 112 actuating the respective pump units. The reservoir 15, the pipe lines 21, 22, 25, and 26, the pump units 20; the operating levers 112 and the air domes 136 all co-operate to supply fluid to actuate the motors M. The elements named may be of any approved construction; they are shown conventionally and described merely for the purpose of illustrating means for supplying fluid to actuate the motors. The gate stands are both alike and the mechanism housed in one is the same as the mechanism housed in the other. Each gate stand contains an engine or motor M, preferably of the type set forth in the parent application, Serial No. 553,623 above noted; and a train of gears—now to be described—for operating the gate.

A horizontal rack bar 80, actuated by the motor M, slides in a channel bar 82 which is supported on stationary standards 81 shown in Figs. 6 and 7.

A horizontal shaft 83, transverse to the housing, is oscillative in bearings 88 (Fig. 3) in the housing. A horizontal shaft 84, parallel to the shaft 83, is rotative in bearings 85 in the housing. United gear wheels 86 and 87 are keyed on the shaft 83. A pinion 89 is fixed on the shaft 84. The gear 86 engages with and is actuated by the rack-bar 80 during outward sliding and during inward sliding of the rack-bar. The scope of the longitudinal movement of the rack-bar 80 is such that each full outward movement of the rack will cause the shaft 83 and the connected gears 86 and 87 to oscillate counter-clockwise in an arc of approximately ninety degrees; and each full inward move-

ment of the rack-bar will cause the same gears to oscillate clockwise in the same arc. The gear wheel 87 meshes with the pinion 89 which is fixed on the shaft 84 and each oscillation of the gear 87, either to the right or to the left, produces one complete rotation of the shaft 84.

A sleeve 91, rotative around the shaft 83, has an integral eccentric cog gear 92 and an integral bevel gear 93.

An eccentric gear 90, fixed on the shaft 84, meshes with and drives the gear 92 and thereby causes rotation of the gear 93 at variable speed, either clockwise or counter-clockwise, according to the direction of rotation of the gear 90. Fixed collars 100 prevent sliding of the sleeve 91 on the shaft 83.

There are two gates, 18 and 19, at each highway crossing. Each gate comprises a derrick and a semaphore co-acting with the derrick to safeguard the highway while trains from either direction are approaching the place where the highway crosses the track, or tracks.

Each derrick (Fig. 2) comprises side bars 95 and cross bars 108 firmly united to form a rigid frame supporting the semaphore.

A derrick shaft 94 extends lengthwise nearly the full length of the derrick, and rotates in bearings 96 on the cross bars 108 A bevel pinion 97, secured on the shaft 94, is driven by the gear 93. A transverse shaft 103 extends through the derrick-rails 95 and is oscillative in bearings 109 in the rails. Semaphore-side-bars 101 are secured on the shaft 103 by screws 110. A miter gear 104, keyed on the shaft 103, is driven by the gear 98, to cause the semaphore to oscillate in unison with the shaft 103.

The derrick-rails 95 are secured at the respective ends of the shaft 83 by screws 105 and lock washers 106 (Fig. 3) in order that the derrick may oscillate in exact accord with the oscillations of the shaft 83. Counter weights 107, attached to the respective derrick-rails 95, facilitate the raising of the free end of the derrick. Similar counter weights 111, attached to the side rails of the semaphore, facilitate the raising of the semaphore.

Operation.

Starting with the rack 80 and the gears 86, 87, 89, 90 and 92 in the position shown in Fig. 3, the derrick and the semaphore being in depressed or closed position, extending horizontally across the highway; the gears, the derrick, and the semaphore arm will co-operate, in a manner now to be described, to raise the gates to open position. The rack-bar 80 will be slid outwardly to cause the shaft 83 and the gears 86 and 87 to oscillate counter clockwise to the extent of approximately 90 degrees, and the gear 87 driving the pinion 89 will cause clockwise rotation of the shaft 84 and the eccentric gear 90, secured on the shaft 84; the eccentric gear 90 engaging with the eccentric gear 92 will cause counter-clockwise rotation of the gear 93. The counter-clockwise oscillation of the shaft 83 will cause the weighted, or inner, ends of the derrick to turn downwardly thereby raising the outer end of the derrick.

The eccentric gears 90 and 92 are timed so that the free end of the semaphore will float in a horizontal line at a suitable height above the ground, in order that if the semaphore arm strikes an obstruction, it will yield without danger of breaking the gate or seriously injuring persons, or vehicles, which may be struck by the arm.

Simultaneously with the raising of the outer end of the derrick the gear 93 will drive the pinion 97 to oscillate the shaft 94, and the gear 98 at the outer end of the shaft will actuate the gear 104 to cause the semaphore on the shaft 103 to turn downwardly to a position approximately parallel to the raised derrick.

Having fully described my invention what I claim as new and desire to secure by Letters Patent is:

1. In a railway gate equipment of the class described, the combination of a housing; a first shaft oscillative in bearings in the housing; a second shaft rotative in bearings in the housing; united gear wheels fixed on said first shaft; a sliding rack engaging one of said united gear wheels; a sleeve loose on said first shaft; a pinion on the second shaft driven by one of the gears on said first shaft; an eccentric gear on said second shaft; an eccentric gear on said sleeve co-acting with the eccentric gear on the second shaft; a bevel gear on said sleeve; a derrick connected with said oscillative first shaft; a longitudinal derrick shaft rotative in bearings on the derrick; a pinion fixed at one end of said derrick shaft and driven by the bevel gear on said sleeve; an oscillative shaft transverse to the derrick at its upper end; a semaphore fixed on said transverse shaft; and a bevel gear fixed on said transverse shaft and driven by the bevel gear at the upper terminal of said longitudinal derrick shaft; said eccentric gears being timed to project the semaphore outwardly at variable speed during downward turning of the derrick.

2. In an appliance of the class described, the combination of an oscillative main shaft; a derrick and its semiphore carried by the main shaft; united gears fixed on the main shaft; means for actuating the united gears, to oscillate the main shaft; a second shaft parallel to the main shaft and actuated by one of said united gears; a sleeve loose on the main shaft and carrying an eccentric gear, and a bevel gear actuating the sema-

phore; and an eccentric gear carried by said second shaft and co-acting with the eccentric gear on said sleeve to effect variable speed of rotation of the sleeve, and consequent variable speed of movement of the semaphore.

In witness whereof I have hereunto signed my name at Peoria, Illinois, this 17th day of September, 1923.

CHARLES W. BUTTRICK.

Witnesses:
HILA M. BROWN,
RUDEL MCKINNEY.

Certificate of Correction.

It is hereby certified that in Letters Patent No. 1,545,231, granted July 7, 1925, upon the application of Charles W. Buttrick, of Springfield, Illinois, for an improvement in "Gate Equipments for Railways," errors appear in the printed specification requiring correction as follows: Page 1, line 10, for the word "plates" read *places*, and line 53, for "Serial Number 533,623" read *Serial Number 553,623;* and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 2d day of March, A. D. 1926.

[SEAL.]

WM. A. KINNAN,
Acting Commissioner of Patents.