V. M. CASALE.

SAFETY GATE FOR RAILWAY PLATFORMS.

APPLICATION FILED OCT. 20, 1919.

1,326,574.

Patented Dec. 30, 1919.

4 SHEETS—SHEET 1.

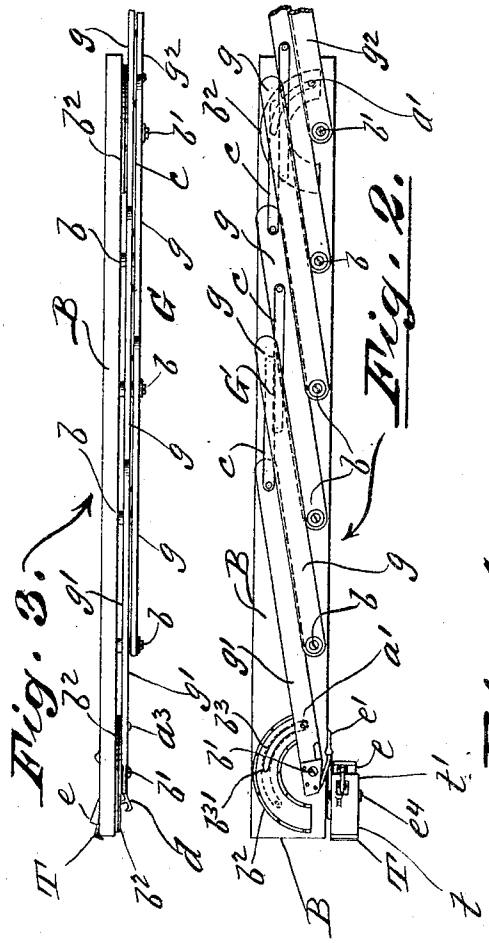


Fig. 3.

Fig. 2.

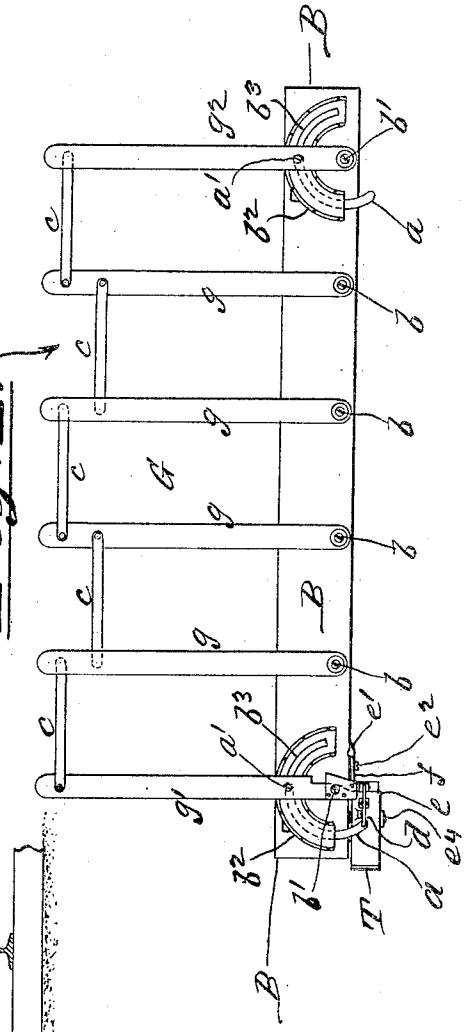


Fig. 1.

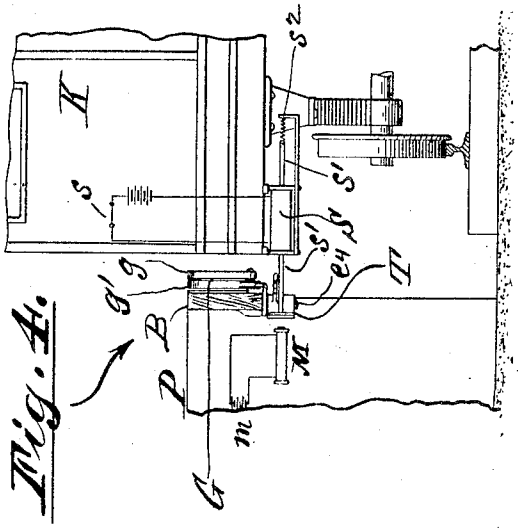


Fig. 4.

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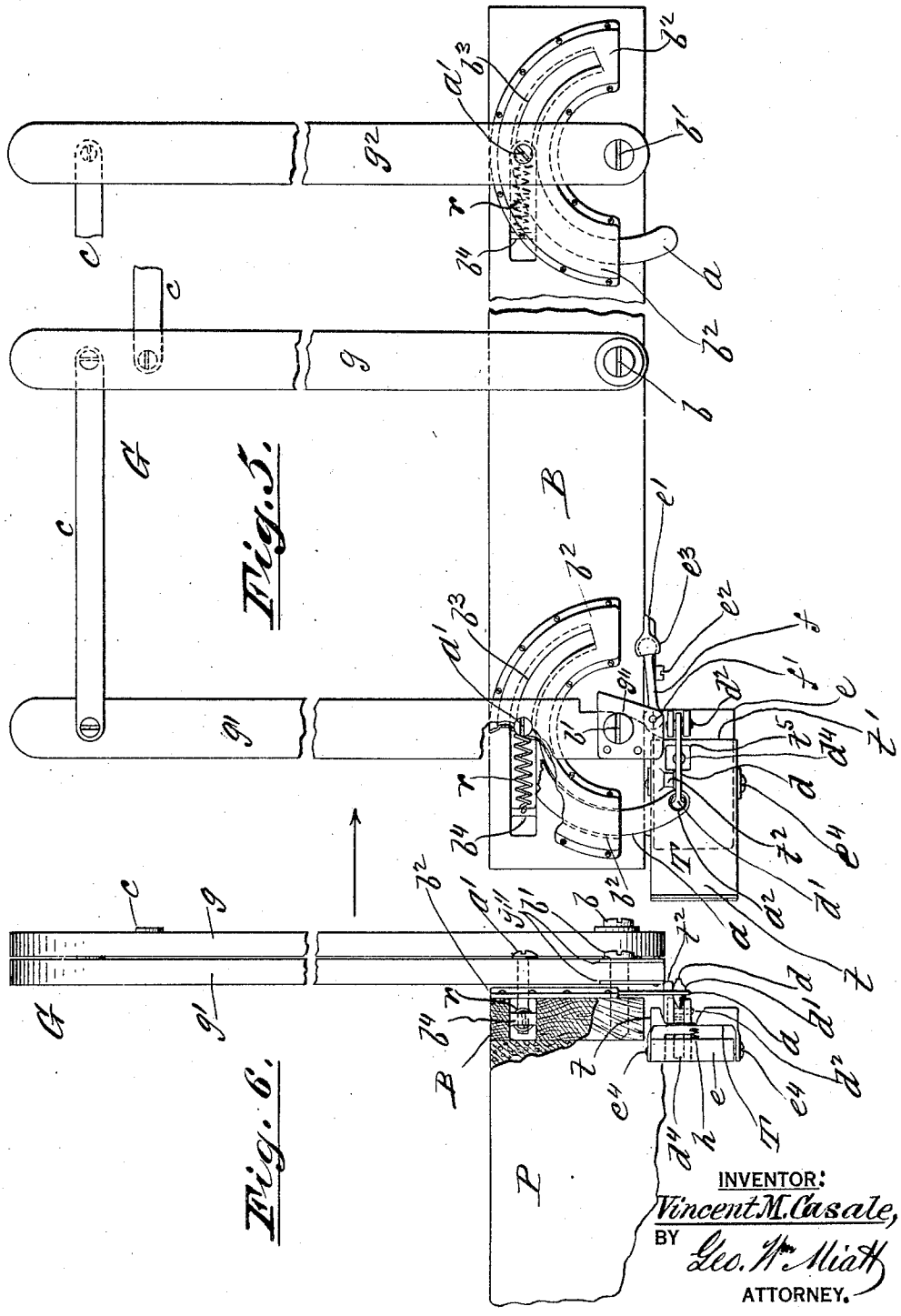


Fig. 5.

Fig. 6.

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4 SHEETS—SHEET 3.

Fig. 7.

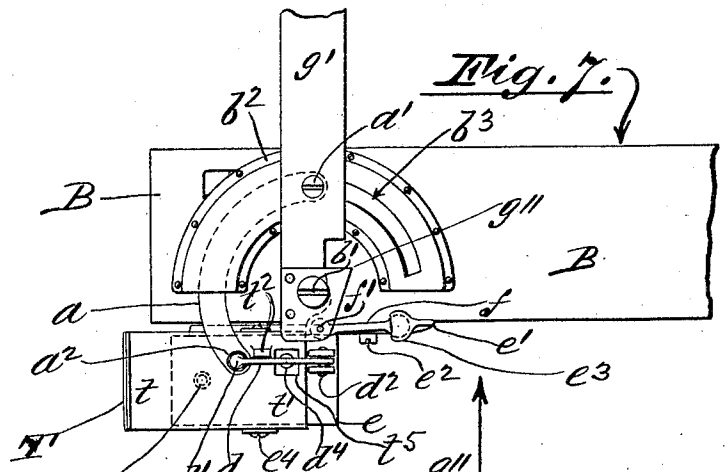
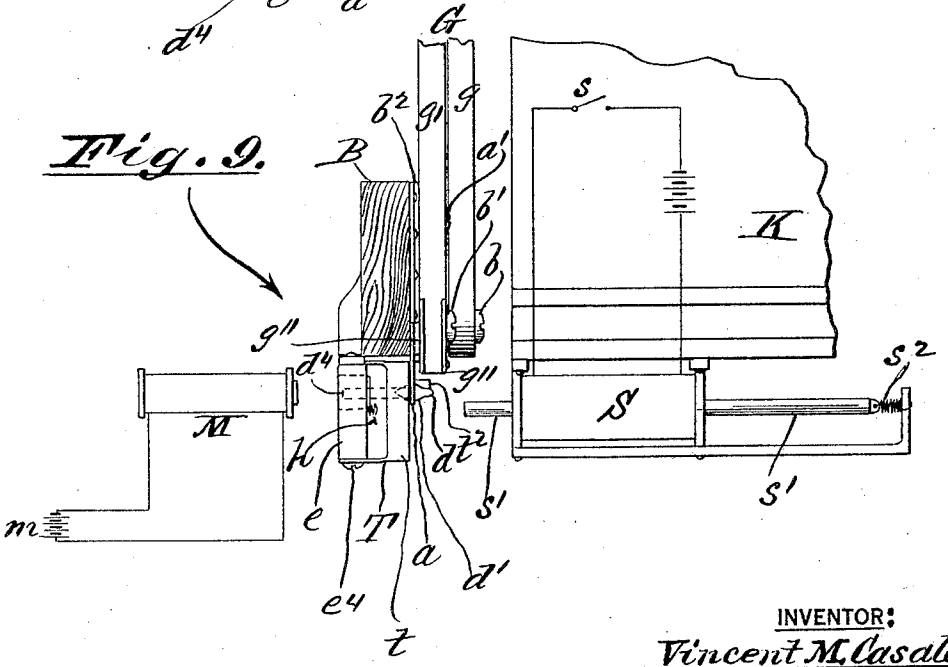


Fig. 8.

Fig. 9.



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4 SHEETS—SHEET 4.

Fig. 10.

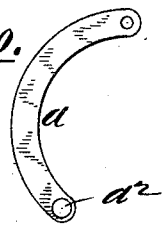


Fig. 11.



Fig. 12.

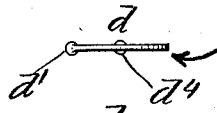


Fig. 13.

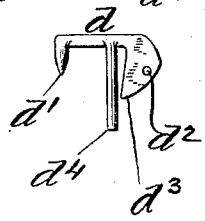


Fig. 14.

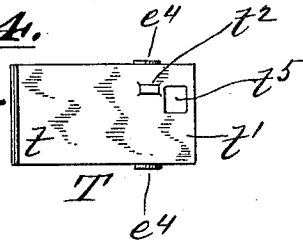


Fig. 15.

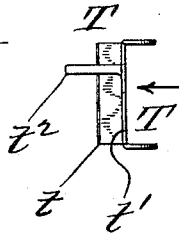


Fig. 16.

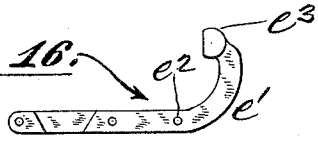


Fig. 17.

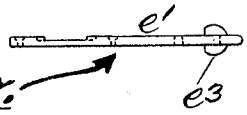


Fig. 18.

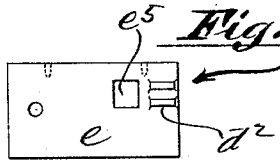


Fig. 19.

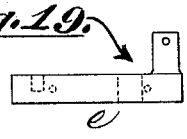


Fig. 21.

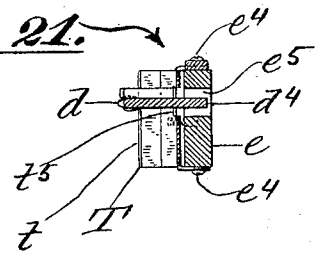


Fig. 20.

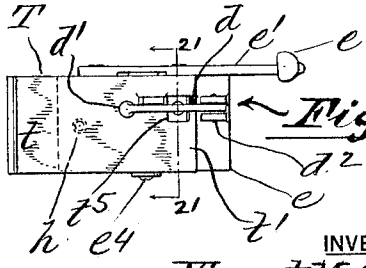
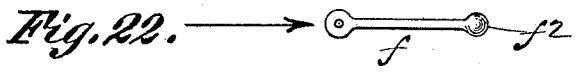


Fig. 22.



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UNITED STATES PATENT OFFICE.

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SAFETY-GATE FOR RAILWAY-PLATFORMS.

1,326,574. Specification of Letters Patent. Patented Dec. 30, 1919.

Application filed October 20, 1919. Serial No. 331,761.

To all whom it may concern:

Be it known that I, VINCENT M. CASALE, a subject of the King of Italy, (having declared my intention of becoming a citizen of the United States,) and a resident of the borough of Brooklyn, county of Kings, city and State of New York, have invented certain new and useful Improvements in Safety-Gates for Railway-Platforms, of which the following is a specification.

The object of my invention is the provision of an automatically closing platform gate that can be opened only (in a practical sense) by electro-mechanical means controlled on a railroad car suitably equipped in such manner that the gate cannot be lowered until the car entrance is in proper relation to the part of the platform on which the gate mechanism is mounted. In other words, the gate can only be lowered when the entrance to the car is in coincidence therewith; and when the operative gate opening mechanism on the car is released, the gate closes automatically so as to obviate all danger of accident, all as hereinafter more fully set forth,—the invention consisting in the specific construction and arrangement of parts described and claimed,—and distinctive features being the use on the car of a plunger actuated by a solenoid for the purpose of tripping the gate opening mechanism on the platform, and in the use of a magnetic bolt for automatically locking the gate in closed position when released from engagement with the said actuating solenoid plunger on the car.

In the accompanying drawings,

Figure 1, is a front view of my platform gate mechanism in elevated or closed position;

Fig. 2, is a front view of the same in depressed or open position;

Fig. 3, is a top view of the parts as shown in Fig. 2;

Fig. 4, is a diagrammatic view illustrating the operative relation between car and platform, the gate being in depressed or open position;

Fig. 5, is a front elevation, on a larger scale, and broken away in part, of the gate end mechanism;

Fig. 6, is a sectional elevation taken at right angles to Fig. 4;

Fig. 7, is an elevation of the gate trip mechanism;

Fig. 8, is a view of the under side of the parts as shown in Fig. 6;

Fig. 9, is a diagrammatic view showing the relative position of parts prior to the tripping operation;

Fig. 10, is a front view of the segmental tongue used in connection with the gate tripping mechanism;

Fig. 11, is an edge view thereof;

Fig. 12, is a front edge elevation of the latch lever;

Fig. 13, is a view of the under side thereof;

Fig. 14, is a front view of the trip lever plate;

Fig. 15, is an inner end elevation thereof;

Fig. 16, is a view of the under side of the horizontal rock lever;

Fig. 17, is a read edge view thereof;

Fig. 18, is a front view of the bearing block;

Fig. 19, is a bottom view thereof;

Fig. 20, is a front elevation of the bearing block, horizontal rock lever, and latch lever, assembled;

Fig. 21, is a transverse section upon plane of line 21—21, Fig. 20;

Fig. 22, is a detail of the link between the horizontal rock lever and the paling connected with the trip mechanism.

For convenience of illustration in the drawings I have shown my gate controlling mechanism as mounted upon a base B, which may be attached to or incorporated with the front structure of the station platform P, as may be found most expedient. In either case the base B, is rigidly supported in a prescribed position, and extends the whole length of the gate G, the palings g, of which are pivotally attached to said base B, as at b, b, b', b', in alinement with each other,— b', b', representing the pivots upon which the end palings g', g^2, are fulcrumed. The upper or otherwise free ends of the palings g, g', g^2, are articularly coupled together by means of link rods c, c, interposed between and pivotally connected to adjoining palings; and the alternate fulcrums of the

latter are advanced beyond those next adjacent, so that the paling, when folded together to open the gate way, may overlap and fit snugly together as shown in Figs. 2, 3, 4, 6 and 9, of the drawings.

To each end paling g', g^2, is attached by means of a pivotal stud a',—a segmental tongue a, in the form of an arc of a circle of which the paling fulcrum b', is the center. Each of these segmental tongues a, is held in place by a semi-circular cap plate b^2, secured to the front of the base B, and formed with a slot b^3, concentric with the paling fulcrum b', through which slot b^3, the aforesaid pivotal stud a, protrudes. Hence these slots b^3, allow the end palings g', g^2, to be raised or depressed with the other intermediate palings g, g, notwithstanding their pivotal connection with the segmental tongues a.

Each stud a', is connected with a coiled retractile spring r, (Figs. 5 and 6) attached at its other extremity to a fixed part b^4, said springs tending constantly to hold the palings in upright position with the studs a', resting against the upper ends (b^{31}, Fig. 2) of the cap slots b^3, that being the normal position of said gate palings, and the upper ends of the said slots b^3, performing the function of stops prescribing the closed position of the gate, in which position the parts are locked normally by a bolt d', which protrudes into a recess a^2, formed for it in the outer or unattached end of the segmental tongue a, connected with the end paling g', as shown more particularly in Figs. 5, 6, 7 and 8. The locking bolt d', constitutes practically the free end of a latch lever d, said lever d, being fulcrumed at d^2, upon a bearing block e, which is rigidly attached to a horizontal rock lever e', pivotally supported on the base B, at e^2. This horizontal rock lever e', is articularly coupled to the lower end of the paling g', by means of a link f, one end of which is pivoted at f', between plates g'', (Figs. 6, 8 and 9) rigidly secured to said lower extremity of the paling g', while the other end f^2, of said link f, is globular (Fig. 22) and rests in a socket e^3, formed for it on the inner end of the said rock lever e. This ball and socket connection between the link f, and the inner end of the horizontal rock lever e', enables the link f, to conform, without strain of parts, to the plane of motion of the rock lever e', as related to that of the end paling g'.

On the bearing block e, is fulcrumed (at e^4) a trip lever plate T, interposed between which and the bearing block e, is a spring h, (see particularly Fig. 8) which tends constantly to thrust the outer portion t, of said trip lever plate T, forward away from the bearing block e. The inner portion t', of said trip lever plate T, protrudes between the bearing block e, and the short arm d^3 of the latch lever d, as shown particularly in Fig. 8; and the trip lever plate T, is also provided with a protuberant arm or extension t^2, which extends over the latch lever d, guiding and sustaining the latter and holding it in operative position when its bolt d', is in engagement with the recess a^2, in the otherwise free end of the segmental tongue a, as will be understood more particularly by reference to Figs. 5 and 6.

The engagement of the bolt d', with the recess a^2, in the free end of the segmental tongue a, is effected and maintained under normal conditions (with the gate raised) by means of a permanently energized electromagnet M, (Figs. 4 and 9) acting upon an armature d^4, attached to or integral with the latch lever d, and from which it protrudes rearward into the field of influence of the core of said magnet M, the coil of the latter being included in a circuit in which a source m, of electricity is interposed. Hence this magnet M, acting on the latch lever armature d^4, tends constantly to pull the bolt d', into position for engagement with the free end of the segmental tongue a. In this connection it may be stated that the bearing block c, is recessed as at e^5, (Figs. 18 and 21) and the trip lever plate as at t^5, to admit of such protrusion of the rear end of the armature d^4, into the field of influence of the core of the magnet M.

S, is a solenoid suitably mounted and positioned upon the body of a railway car K, and interposed in an electric circuit which may be closed by a switch s, or equivalent means, to effect the energizing of the coil and the forward thrust of its core plunger s', otherwise held retracted by a spring s^2.

The operation is as follows, the parts being in the relative positions shown in Figs. 1, 5, 6, 7, 8 and 9, with the gate raised, and the railway car K brought into proper juxtaposition to the gate controlling mechanism shown in Figs. 7 and 8,—which is to say, with the plunger s', of the solenoid S, on the car K, substantially at right angles to, and in coincidence with, the trip lever plate T, on the bearing block e. Under these conditions if the solenoid circuit be closed, as at s, the core plunger s', will be made to impinge against the outer portion t, of said trip lever plate T, immediately rocking the latter on its pivotal support e^4, on the bearing block e, against the resistance of the spring h. As a first result, the inner portion t', of said trip lever plate T, contacting with the short arm d^3, of the latch lever d, rocks the latter on its fulcrum d^2, against the resistance of the electromagnet m, thereby withdrawing the bolt d', from the hole a^2, in the outer end of the segmental tongue a'. This unlocks the gate mechanism, and the continued advance of the plunger s', pushing against the trip lever plate T, and bearing block e, then swings the horizontal rock

lever e', on its fulcrum e^2, said rock lever e', acting through its link f, to turn the paling g', and other palings g, g, g^2, on their fulcrums b', b', b, b, against the resistance of the springs r, r, until the gate G, is depressed from the upright position shown in Figs. 1, 5 and 6, into the horizontal position shown in Figs. 2 and 3, in which position it is held by the solenoid S, and its plunger s', as long as the switch s, is closed.

Upon the opening of the switch s, the solenoid allows the spring s^2, to assert itself, and retract the plunger s', into normal position. This releases the gate actuating mechanism, which is immediately restored to normal position by the retractile springs r, r. That is to say, said springs r, r, raise the palings, until the studs a', again rest against the upper ends (b^{31}, Fig. 2) of the slots b^3, in the cap-plates b^2, the lower end of the first paling g', acting through the link f, rocking the lever e', and block e, back into normal position, when the fixed magnet M, again exerts its influence on the armature d^4, of the latch lever d, causing the bolt d', to again enter the recess a^2, in the segmental tongue a, and thus again lock the gate in elevated or closed position,—the spring h, having returned the trip plate T, to its normal position, out of contact with the short arm d^3, of the latch lever d, immediately after the plunger s', has ceased to contact with said trip plate T.

Thus, aside from the closing of the switch s, the whole operation of my safety gate apparatus is automatic both in opening and closing the gate; and the gate cannot be opened until the car K, is in a prescribed position,—*i. e.*, that necessity to bring the solenoid plunger s', in alinement with the outer portion t, of the trip lever plate T.

What I claim as my invention and desire to secure by Letters Patent is,

1. In a safety gate appliance of the character designated, the combination of a plurality of pivotally mounted and connected palings held in normal closed position by spring tension means, said spring tension means, means for locking the parts in such closed position including a latch lever formed with an armature, a magnet arranged to act on said armature, a trip lever plate arranged to retract the latch lever against the influence of said magnet on the said armature, a rock lever connected with the gate, and a solenoid and core plunger on a railway car adapted to actuate said trip lever plate and gate lever, for the purpose described.

2. In a safety gate appliance of the character designated, the combination of a plurality of pivotally mounted and connected palings held in normal closed position by spring tension means, said spring tension means, a gate rock lever for effecting the elevation and depression of the palings, and a solenoid core plunger on a railway car arranged to actuate said gate rock lever, for the purpose described.

3. In a safety gate appliance of the character designated, the combination of a plurality of pivotally mounted and connected palings held in normal closed position by spring tension means, said spring tension means, gate actuating means connected with said palings, and a solenoid core plunger on a railway car arranged to contact with and operate said gate-actuating means, for the purpose described.

4. In a safety gate appliance of the character designated, the combination of a plurality of pivotally mounted and connected palings held in normal closed position by spring tension means, said spring tension means, a trip lever plate and latch lever forming part of the gate controlling means, and a solenoid core plunger on a railway car arranged to contact with said trip lever plate, for the purpose described.

5. In a safety gate appliance of the character designated, the combination of a plurality of pivotally mounted and connected palings held in normal closed position by spring tension means, said spring tension means, a segmental tongue attached to one of the palings and formed with a bolt hole, a stationary cap plate controlling said segmental tongue, a latch lever pivotally supported on a gate rock lever and adapted to engage with said segmental tongue and being also formed with an armature, a magnet positioned to attract said armature, a trip lever plate also pivotally mounted on said gate rock lever and adapted to contact with said latch lever, said rock lever, and a solenoid core plunger on a railway car arranged to contact with said trip lever plate and gate rock lever, for the purpose described.

6. In a safety gate appliance of the character designated, in combination, a plurality of pivotally mounted and connected palings held in normal closed position by spring tension means, said spring tension means, gate actuating and locking mechanism of which an armature carrying latch lever is a component part, a magnet positioned to attract said armature carrying latch lever, a tripping plate lever arranged to contact with said latch lever, and a solenoid core plunger on a railway car arranged to contact with said trip lever plate, for the purpose described.

7. In a safety gate appliance of the character designated, in combination, a plurality of pivotally mounted and connected palings held in normal closed position by spring tension, the fulcrums of alternating palings being in advance of those next adjoining, so that the palings when closed will overlap

each other together with means for turning said palings on their said fulcrums, for the purpose described.

8. In a safety gate appliance of the character designated, in combination, a depressible gate, magnet actuated means for locking said gate in its closed position, and a solenoid core plunger on a car arranged to trip said gate locking means, for the purpose described.

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Witnesses:
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DOROTHY MIATT.