(No Model.) 2 Sheets—Sheet 1.

E. DEATH.

AUTOMATIC RAILWAY GATE AND SIGNAL.

No. 529,250. Patented Nov. 13, 1894.

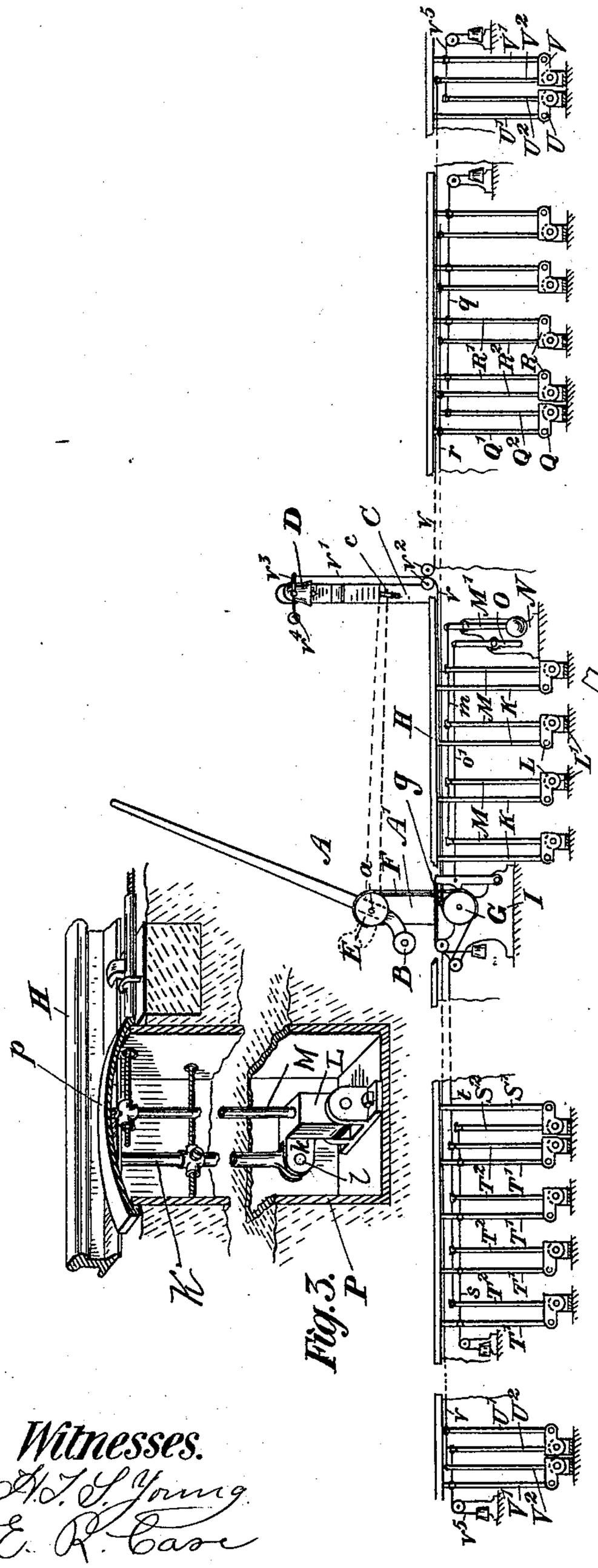

Fig. 3.

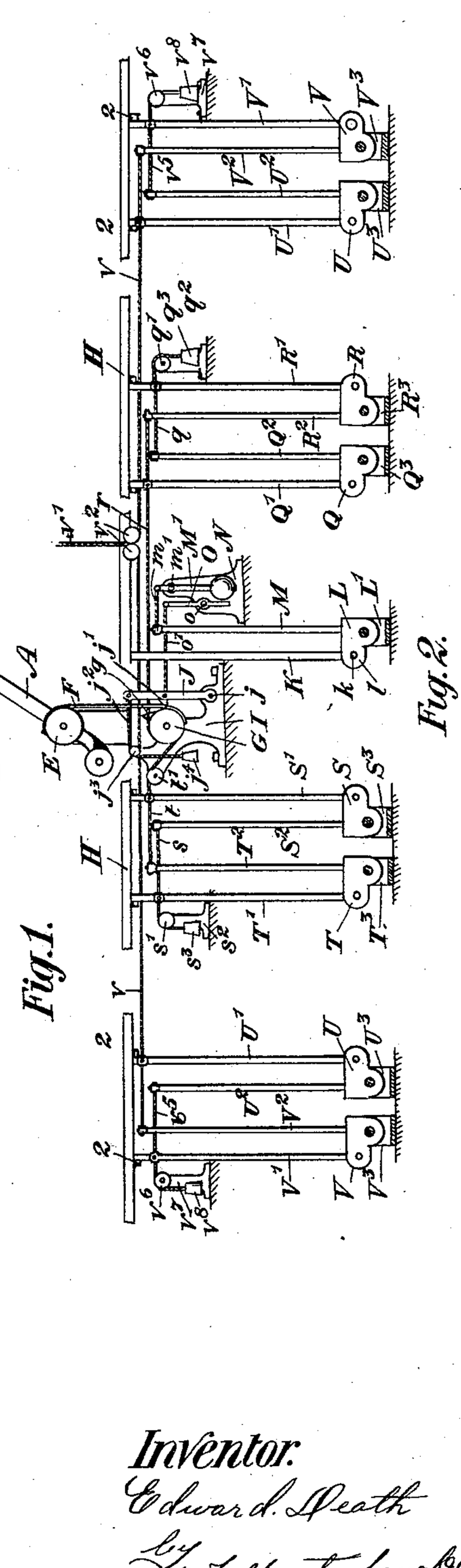

Fig. 2.

Fig. 1.

Witnesses.
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(No Model.) 2 Sheets—Sheet 2.

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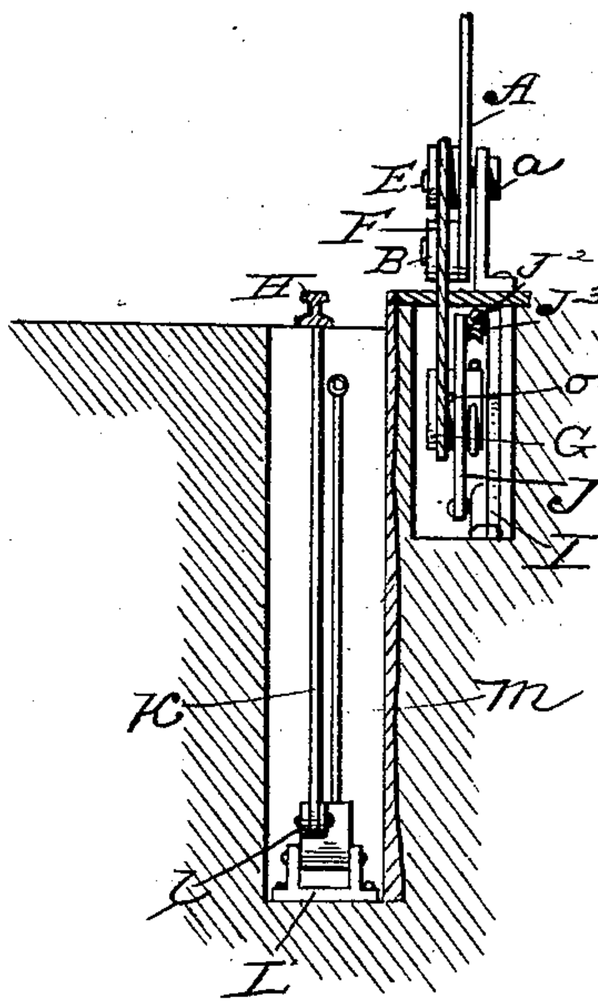
Fig. 4.



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UNITED STATES PATENT OFFICE.

EDWARD DEATH, OF TORONTO, CANADA, ASSIGNOR OF TWO-THIRDS TO EDWARD WOODS WYATT, OF SAME PLACE.

AUTOMATIC RAILWAY GATE AND SIGNAL.

SPECIFICATION forming part of Letters Patent No. 529,250, dated November 13, 1894.

Application filed June 9, 1894. Serial No. 514,063. (No model.)

To all whom it may concern:

Be it known that I, EDWARD DEATH, bricklayer, of the city of Toronto, in the county of York, in the Province of Ontario, Canada, have invented certain new and useful Improvements in Automatic Railway Gates and Signals, of which the following is a specification.

My invention relates to improvements in automatic railway gates and signals and the object of the invention is to devise a simple, cheap and efficient operating mechanism whereby warning may be given at crossings and the gates closed automatically by the train before it has reached the crossing and automatically opened after it has passed and it consists essentially of providing a series of plungers underneath one of the rails of the track which are pivotally connected at the lower end to bell cranks which have rigidly attached above their pivot points an upright, the plunger and upright connected to each bell crank being situated at desired distances apart beneath the rail and being connected by wire or cord to a bell and to a wheel connected by a belt or chain to a wheel on the gate, means being provided to lock the gate when the train is passing and unlock it when the train has passed and the operating parts being otherwise arranged and constructed in detail as hereinafter more particularly explained.

Figure 1, is a sectional elevation intermediately broken away so as to show the general construction and arrangement of the mechanism comprised in my invention. Fig. 2, is an enlarged view showing my device more in detail. Fig. 3, is an enlarged sectional perspective view intermediately broken away vertically so as to show the construction, position and connection of each bell crank, plunger and upright as incased. Fig. 4 is a section taken transversely of the track on one side of the gate.

In the drawings like letters and numerals of reference indicate corresponding parts in each figure.

A, is the gate which is pivoted at, *a*, upon the standard, A′, and provided with a weighted end, B.

C, is the post at the opposite side of the road-way. The post, C, is provided with a rest, *c*, into which the free end of the gate, A, fits when it is down as indicated in dotted lines.

D, is the bell which is swung near the top of the post C.

E, is a wheel which is rigidly secured to the gate, A, and journaled on the stud, *a*.

F, is a belt or chain which passes partially around the wheel, E, and passes down to the wheel, G, suitably journaled on the standard, I, beneath the road-bed to one side of the rail, H. The belt, F, extends partially around the wheel, G, as shown.

g, is a ratchet shaped tooth formed on the wheel, G, to one side of the rim.

J, is a bar pivoted at the lower end at, *j*, on the standard, I, and provided with a ratchet tooth, *j*, with which the tooth, *g*, is designed to be brought in engagement as hereinafter described.

j^2, is a cord which is secured at one end of the bar, J, and extends over a pulley, j^3, journaled in the top of the standard plate, I. The cord, j^2, is provided with a weight j^4, as indicated.

K, is a plunger which is pivotally connected at, *k*, within the jaw, *l*, located at one side and forming part of the bell crank, L. The bell crank, L, is pivoted in the bearing bracket, L′. The plunger, K, is normally vertical and extends up to and touches or nearly touches the bottom of the rail.

M, is an upright which is secured in the top of the bell crank, L, and extends upwardly as shown. The upright, M is connected by the cord, *m*, to the weighted lever, M′, which is pivoted at, *m′*, on the standard, N.

O, is a lever pivoted at, *o*, on the standard, N, and having the lower end extending in proximity with the weighted end of the lever, M′. The upper end of the lever, O, is connected by the cord, *o′*, to the bar, J. There is a series of plungers, K, and uprights, M, and bell cranks, L, as indicated in Fig. 1, the bell cranks being situated at suitable distances apart. Each plunger, K, upright, M, and bell crank, L, and journal bracket, L′, is inclosed in a suitable casing, P, which is provided with a cover, *p*, as indicated in Fig. 3.

Q, Q′, Q^2, are a bell crank, plunger and up-

right, the bell crank of which is journaled in the bracket, Q^3, to the right hand of the crossing and similarly formed to the bell crank, L, plunger, K, and upright, M, underneath the rail at the crossing.

R, R′, R^2, are bell cranks, plungers and uprights the bell cranks of which are pivoted on the bracket, R^3, as shown in Fig. 1, one set only being shown in Fig. 2. There are a series of sets of bell cranks, plungers and uprights, R, R′, R^2, situated at desired distances apart as indicated in Fig. 1.

r, is a wire or cord which is connected to the top of the uprights, R^2, and plunger, Q′. The other end is connected to the wheel, G, and partially extends round the rim of the same to one side of the belt, F.

q, is a wire or cord which is connected to the upper end of the upright, Q^2, and plunger R′, and passes round the pulley, *q*′, journaled in the upper end of the standard, q^2. The cord or wire, *q*, is provided with a weight, q^3. It will be noticed that the bell crank R, is reversely turned to the bell crank, Q.

S, S′, S^2, are a bell crank, plunger, and upright, the bell crank of which is journaled in the bracket, S^3.

T, T′, T^2, are the bell cranks, plungers and uprights, which are journaled in the brackets, T^3, as shown in Fig. 3. There is a series of these bell cranks, plungers and uprights each set being located at desired distances apart, as indicated in Fig. 1.

t, is a wire or cord which is connected to the top of the uprights T^2, and plungers, S′, and extends to the wheel, G, which it partially surrounds to one side of the belt, F.

t′, is a pulley journaled in the standard, I, forming a guide for the wire or cord, *t*.

s, is a wire or cord connected at the top of the upright, S^2, and plungers, T′, and extending over the pulley, *s*′, journaled in the top of the bracket, s^2. The cord, *s*, has secured to its free end the weight, s^3.

U, U′, U^2, are a bell crank, plunger and upright, the bell crank of which is journaled in the bracket, U^3, to the right hand side of the crossing, and, V, V′, V^2, are a reversely turned bell crank, plunger and upright located in proximity to the bell crank, U. The bell cranks, U, and, V, and their plungers and uprights are located to each side of the crossing and farther away from it than the bell cranks, Q, R, or S, and T.

v, is a cord connecting each upright, V^2, and plunger, U′, to the cord, *v*′. Both cords, *v*, *v*′, pass around the pulleys, v^2, and are connected together to the cord, *v*′, which is connected to the arm, v^3, of the bell, D. The opposite end of the arm, v^3, has a weight, v^4, which is designed to take up the slack.

The uprights, U^2, of each bell crank, U, are connected to the plungers, V′, of the bell cranks, V, by the cords, v^5, the free ends of which extend over the pulleys, v^6, journaled in the upper end of the standards, v^7, and are provided with weights v^8.

2, are the stop blocks secured to the bottom of the rail next to each of the plungers as shown in Fig. 2 to limit the movement of the plungers.

Having now described the principal parts involved in my invention I shall briefly describe the mode of operation of the parts.

It is well understood that the rails when a train passes over them temporarily subside to a more or less degree and from this fact I have found that such temporary subsidence can be utilized to accomplish the object of my invention. The train is supposed to be coming from the right. As it passes over the rail, H, the subsidence of the rail causes the plunger, V′, to move downwardly and tilt the bell crank on its pivot. The upright, V^2, being rigidly attached to the bell crank will be thrown to the right and draw upon the cord, *v*, and cord, *v*′, so as to pull upon the arm, v^3, and swing and ring the bell. The plunger, U′, being connected to the upright, V^2, by the cord, *v*, will be swung free from the bottom of the rail so that the subsidence of the rail will have no effect upon this as the train passes over it. The train as it passes along still causes the rail, H, to subside and next operates the plunger, R′, so as to tilt the bell cranks, R, in succession so that if one fails the succeeding ones will be sure to act. By tilting the bell cranks, R, the uprights, R^2, are thrown to the right and draw upon the cord, *r*, so as to partly rotate the wheel, G, and partially wind the belt, F around the wheel, G, so as to draw upon and partially rotate the wheel, E, and thereby cause the gate to swing down in the position shown in dotted lines in Fig. 1. At the same time that the wheel is partially rotated the tooth, *g*, is brought round and passes by reason of its peculiar form the tooth, *j*′, of the bar, J, and is locked. As the train still passes along the track the rail, H, is still caused to subside and the plungers, K, are brought down so as to tilt the bell cranks, L, and by means of the uprights, M, draw upon the cord, *m*, so as to tilt and hold up the weighted lever, M′. Upon the train having passed from this portion of the rail, H, and therefore passed the crossing, the weighted lever, M′, will fall downwardly and strike the lower end of the lever, O, thereby drawing by means of the cord, *o*′, the bar, J, and consequently the tooth, *j*′, out of engagement with the tooth, *g*, of the wheel, G. The wheel, G, being now released the weight, B, on the end of the gate, A, will cause the gate to assume the upright position shown in Fig. 1. As the train still passes along the track and causes the rail, H, to subside the plunger, S′, is next caused to descend and by means of the cord, *s*, will pull upon the plungers, T′, of the bell cranks, T, thereby tilting the plungers on their pivot and removing their tops from beneath the rail so that there will be no possibility of the gate being operated by these plungers, T′, upon the train having passed the crossing.

The train still in passing along the track in the direction described will next reach the plunger, U′, at the left hand side of the figure and press it down and tilt the bell crank, U, on its pivot. As the upright, U^2, of the bell crank, U, is connected to the plunger, V′, of the bell crank, V, it will be seen that this plunger will be also removed from contact with the bottom of the rail so that the upright, V^2, and cord, *v*, on this side of the crossing will have no tendency whatever to ring the bell after the train has passed the crossing.

From this description it will be seen that I provide a very simple, cheap, and effective operating device whereby railroad crossings are rendered perfectly safe, warning being given and the gate closed automatically only upon the approach of a train to the crossing. It will be also understood that, if the train is coming from the opposite direction, the plungers, bell cranks, and uprights will operate in exactly the same manner to ring the bell and automatically close and open the gate.

What I claim as my invention is—

1. In an automatic gate and signal, in combination a weighted gate journaled on the shaft carried by a vertical standard, a wheel secured to said gate journaled on said shaft, a corresponding wheel below the gate, connections between said wheels whereby the rotation of one rotates the other, a bell crank pivoted below the track, a plunger abutting on the under side of said track carried by one arm of said bell crank, an upright extending vertically from the other arm of the bell crank, the connection therefrom to the lower wheel whereby the depression of said plunger by the subsidence of the track will swing the bell crank with its upright, partially rotate said wheel and the wheel carried by the gate and lower said gate, and means for locking said gate in its lowered position, substantially as described.

2. In combination with a normally raised gate carried by a standard, and a signal bell, the bell cranks pivoted beneath the rail and having vertical arms supporting the said rail and adapted to be depressed on the passing of a train, the arms rigidly connected with said bell cranks, and connections from said rigid arms to the gate and bell whereby subsidence of the rail rings the bell and raises the gate, substantially as described.

3. In combination with the gate A having a weighted end, the wheel E connected thereto, the wheel G having operating connection to wheel E, the rocking bell crank lever having a plunger operated by the track rail, the rigid arm R^2 on the bell crank lever, the cord connection from said arm to the wheel G whereby the depression of the rail operates to raise the gate, the pivoted bar J having a projection engaging the wheel G to hold the gate in a raised position, means for holding the bar J normally toward said wheel G, and means for moving said bar in the opposite direction to unlock the wheel G and permit the gate to be lowered, substantially as described.

4. The combination with the gate A, provided with a wheel E journaled on the pivot stud, of the belt F connecting the wheel E to the wheel G, the cord *r* connected to the uprights R^2 of the bell cranks R, and the plungers R′ pivoted in the end of the bell cranks and abutting on the rail at the top, the bar J having a tooth *j*′, designed to lock the wheel G by means of the tooth *g* and the said tooth *j*′, and having connected to its upper end a cord j^2 which passes over a pulley j^3 and is provided with a weight j^4, and the bell cranks L provided with plungers K, uprights M connected by a cord *m* to the weighted lever M′, the lever O connected by the cord *o*′ to the pivoted bar J, the said plungers K being adapted to be depressed by the subsidence of the rail as the train is passing over them to tilt their respective bell cranks and raise the weighted lever M′ and upon the train having passed to allow the lever M′ to swing downwardly and strike the lower end of the lever O to draw upon the bar J, and free the tooth *g*, of the wheel G from engagement with the tooth *j*′ of the bar J, substantially as described.

5. The combination with the gate A, belt F, and wheel G of the bell cranks R provided with plungers R′ and uprights R^2, the uprights R^2 being connected by the cord *r* to the wheel G and the bell crank Q, plunger Q′, upright Q^2 connected to the said plungers R′ by the cord *q* which passes over the pulley *q*′ and is provided with a weight q^3 all arranged to one side of the crossing, and corresponding bell crank S, plunger S′, upright S^2, cord *s*, pulley *s*′, weight s^3, bell cranks T, plungers T′, uprights T^2, and cord *t*, connected to the uprights T^2 at one end and to the wheel G at the opposite side of said crossing all arranged to coact, substantially as described.

6. The combination with the bell crank U, plunger U′ and upright U^2, cord v^5, pulley v^6 and weight v^8 and bell crank V, plunger V′ and upright V^2 connected to the end of the cord *v*, the opposite end of the said cord *v*, passing round the pulleys v^2 and connected to the cord *v*′ connected to the arm by which the bell is swung, the said plungers and uprights being connected together substantially as described.

7. The combination with the bell cranks, plungers and uprights all arranged to operate as specified upon the subsidence of the rail, of the stop blocks 2, arranged to abut against each plunger when in its normal position as and for the purpose specified.

8. In combination, the gate, the wheel on the axis thereof, the wheel G below the track having a tooth, the connection between the wheels, the locking means arranged to engage the said tooth, the plunger below the said track arranged to be operated by the depression of the rail, the connection between the same and

the wheel G and a second plunger arranged to be operated by the train and connected with the locking means for releasing the gate as the train passes the crossing, substantially as described.

9. In combination, the pivoted gate, the wheel on the axis thereof, the wheel G having a belt connection therewith the said wheel G having a tooth, the toothed locking bar J to engage the toothed wheel, the lever *o*, connected with the locking bar, the weighted lever M arranged to operate the lever *o*, the plunger arranged to be operated by the passing train, and the connection from said plunger to the weighted lever, substantially as described.

10. A railway gate to be operated by the subsidence of the track rail comprising the pivoted gate, a series of plungers arranged at different points along the said track to be operated in succession by the subsidence of said track rail under the weight of the train, and a connection leading to the gate to operate the same, said connection being common to all the plungers whereby they will act in succession to give the gate a closing movement, substantially as described.

11. In combination, the pivoted gate, the plunger R′ arranged beneath the track to be depressed, the bell crank lever, the upright, the cord *r* extending from the upright R^2 and connected with the gate, a second plunger arranged to be operated by the passage of the train having a bell crank and upright connected with the upright R^2 the said second plunger being connected with the first whereby when either plunger is first operated the other will be thrown out of operative position, substantially as described.

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