G. T. HARDENBURGH & J. A. SCHROYER.

AUTOMATIC RAILWAY CROSSING GUARD.

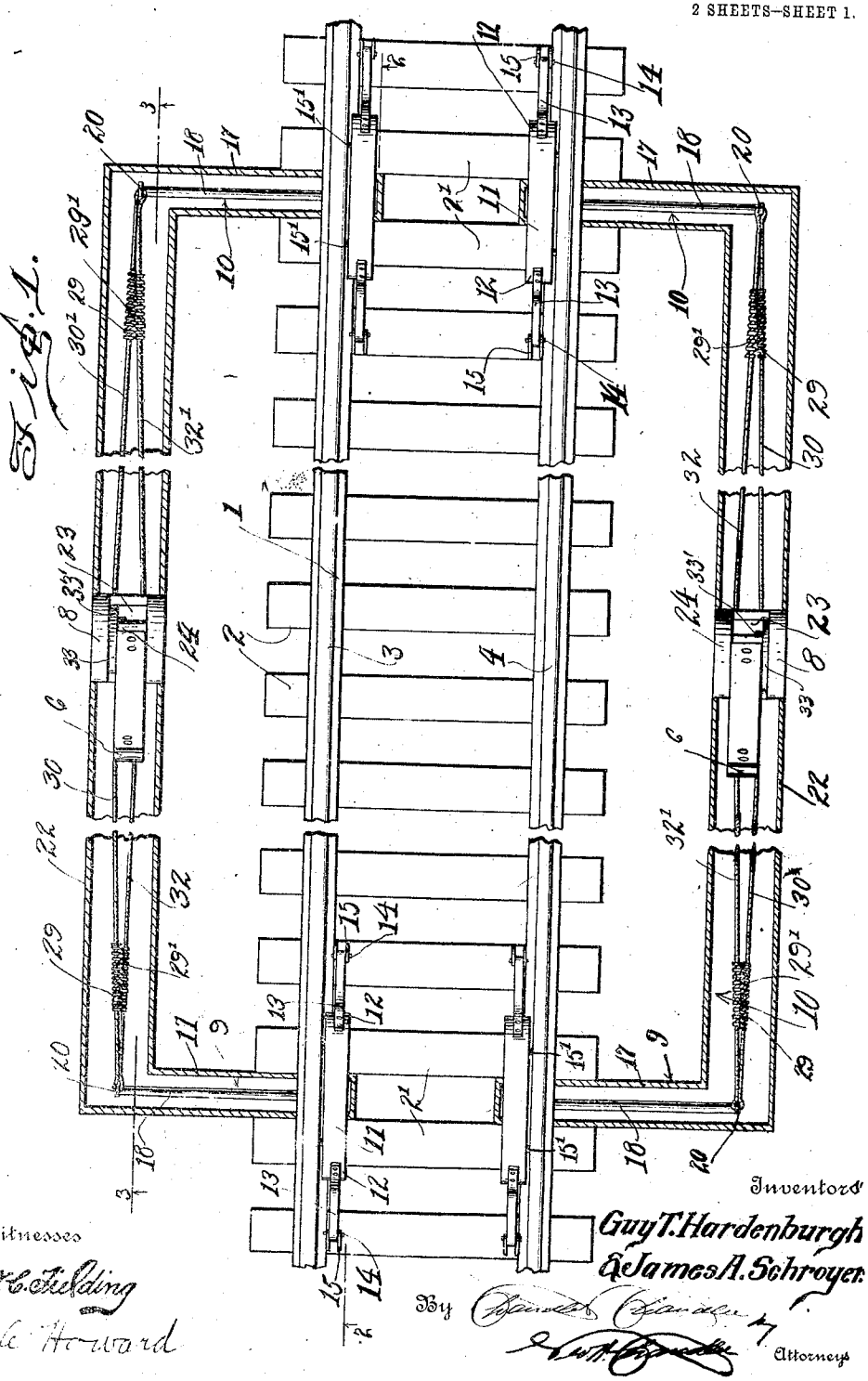
APPLICATION FILED FEB. 27, 1911.

1,023,015.

Patented Apr. 9, 1912.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses

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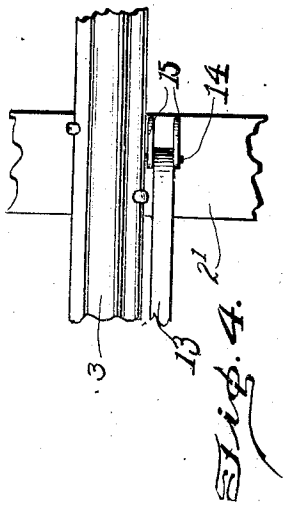

Fig. 4.

Fig. 2.

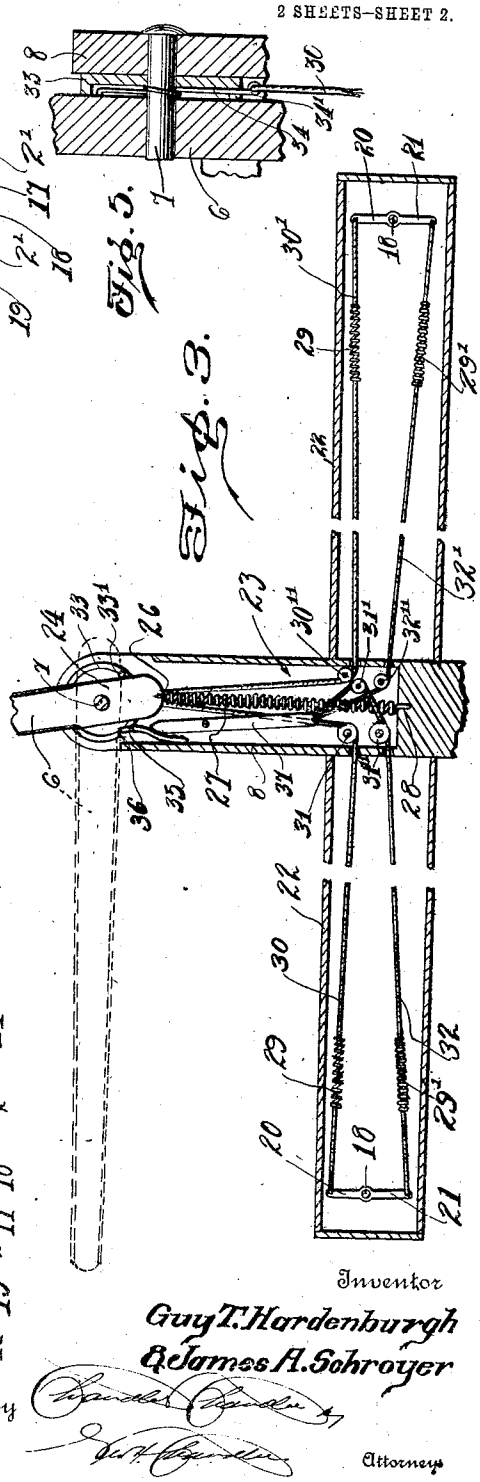

Fig. 3.

Fig. 5.

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AUTOMATIC RAILWAY-CROSSING GUARD.

1,023,015. Specification of Letters Patent. Patented Apr. 9, 1912.

Application filed February 27, 1911. Serial No. 611,213.

To all whom it may concern:

Be it known that we, GUY T. HARDENBURGH and JAMES A. SCHROYER, citizens of the United States, residing at Ira, in the county of Jasper, State of Iowa, have invented certain new and useful Improvements in Automatic Railway-Crossing Guards; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to improvements in automatic railway crossing guards and more particularly to devices of this character in which a pivoted barrier is caused to swing across the road on the approach of a train.

The object of the invention is in general to provide a construction for accomplishing this result which will be simple, reliable and of a durability and efficiency sufficient to fit it to the rather arduous service conditions to which it will be subjected.

With this in view, the invention consists primarily in a false rail placed adjacent one of the line rails at a suitable distance from the crossing and adapted to be moved in a certain manner by the approach of a train in one direction and in a different manner by the approach of a train in the opposite direction, and means whereby these motions may be communicated to a barrier to lower and raise the same.

The invention further consists in a certain construction, combination and arrangement of parts as will be hereinafter more fully set forth, particularly pointed out in the appended claims and illustrated in the accompanying drawings, which show a preferred embodiment of the invention.

In these drawings, which are attached to and form a part of this application, Figure 1 is a top plan view of a railway crossing and showing our improved crossing guards installed. Fig. 2 is a sectional elevation on the line 2—2 of Fig. 1. Fig. 3 is a sectional elevation on the line 3—3 of Fig. 1, and Fig. 4 is an enlarged detail plan view of a false rail spring showing the means of securing the same to the tie. Fig. 5 is a section through the line 5—5 of Fig. 2.

Referring more specifically to these views, in which similar reference numerals designate corresponding parts throughout, 1 indicates in general the road-bed to which are anchored by means of the ties 2, line rails 3 and 4. A highway, not shown, crosses the road-bed adjacent one end of the figure. In order to close the crossing a barrier 6 is pivoted as at 7 in a post 8 at one side of the highway and as shown in Fig. 2 the barrier may be disposed in an elevated or lowered position to bar or leave open the crossing as may be required. As is obvious it is desirable that this barrier should be dropped across the highway some time before the approach of the train and should be elevated again when the train has passed. In order to accomplish this result the barrier operating mechanisms designated in general by 9 and 10 are positioned upon the track at suitable distances on either side of the crossing and are connected with the barrier itself in such a manner that the same will be lowered as the train passes over the first of said mechanisms and elevated when the second has been passed.

Referring to Fig. 2 of the drawings, it will be seen that the mechanism 9 comprises a horizontal member 11, which will be called the false rail, having the arcuate or sloping ends 12. Secured to these ends are leaf springs 13, each of which as shown in Fig. 4 has its outer end slidably secured to a tie by means of the trunnions 14 working in the slotted ears 15. The normal tendency of the springs 13 is to hold the false rail 11 in a horizontal position and slightly above the level of the line rails. In order to maintain this false rail in horizontal position at all times it is provided adjacent each end with a Z shaped pivotal supporting member 15′, one arm of each of said members being revolubly mounted in a suitable bore formed in the rail while the other arm is similarly mounted in a bore formed in the false rail. Cast integrally with or secured to the under face of the false rail 11 is an arm 16. Designating the two ties beneath the false rail by the numeral 2′, it will be seen that the space between these rails is occupied by a hollow or box like structure 17 which as shown in Fig. 1 extends completely across the track and some distance outwardly on either side of the same. Carried in suitable journals in this box is a rock-shaft 18. Secured to the rock-shaft immediately beneath the false rail 11 is a U-shaped or bifurcated piece 19 which as shown is of approximately the width of the T-section 16. The outer end of the rock-

shaft is provided with the oppositely disposed arms 20 and 21 the ends of which are preferably formed with eyes therein.

Communicating with the outward end of the box 17 is the cable conduit 22 which is disposed parallel to the track and ends at the base of the post 8. From Fig. 3 it will be seen that this post or pillar is a hollow member, preferably a casting. The barrier 6 is as previously described pivoted in the upper end of the standard and capable of oscillation in the slot 23. The pivoted or journaled end of the barrier 6, which will be here designated as 24 has a threaded aperture in which is secured the eye-bolt 26. To this eye-bolt is secured a relatively heavy helical spring 27 which is fastened at its lower end 28 to the bottom surface of the post cavity. The tension of this spring is such that a slight additional force will raise the barrier 6. A recessed pulley wheel 33 is revolubly mounted upon the bearing 7 and a coil spring 34 is secured in said recess about the pivot 7 one end of said spring being secured to the barrier member and the other end passing out through an aperture in the periphery of the pulley and bent to form the eye 34′. A spring pawl 35 secured to the inner portion of the casing 8 is adapted to engage a notch 36 upon the pulley 33. This pulley is provided with a laterally directed pin 33′ which bears against the barrier 6 and holds the same in raised position when the pulley is locked by the spring pawl 35. A lever 37 is pivoted near its upper portion to the casing and has its upper end bearing against the spring pawl 35. A cable 30, in which is inserted the helical spring 29, connects the arm 20 with an eye 34′ of the spring 34, passing over a pulley 31 in the base of the post. It will be seen that counter-clockwise rotation of the rock-shaft 18 will elevate the barrier from the position shown in dotted lines to that shown in full lines. A cable 32 secured to the arm 21 and passing over pulleys 31′ and 31″ is connected with the lower end of the pawl releasing lever 37 and it will be seen that a clockwise rotation of the rock-shaft will by means of this cable permit the lever 37 to return to its normal position. The cable 32 is also provided with a tension spring intermediate its length as shown at 29′.

The track mechanism 10 similar to the one above described is connected to the barrier post by means of cables 30′ and 32′, the cable 30′ being secured at the point of attachment of the cable 30 while the cable 32′ is secured to the point of attachment of that designated 32. These cables as shown are passed over suitable pulleys 30″ and 32″ respectively.

The operation of the mechanism above described is as follows. As a train approaches the crossing from the left, the wheel flanges will strike the sloping or arcuate surfaces 12 of the false rails 11 of the mechanism giving to the same a longitudinal motion. At the same time the false rail will be depressed and engaging that arm of the U-member 19 nearest the crossing will cause the rock-shaft 18 to be rotated in a clockwise direction, which will release the pulley and allow the barrier 6 to swing by gravity into a horizontal position and thus guard the crossing. After having passed the crossing the wheel flanges of the train will engage the track mechanism 10, rotating the rock-shaft of this mechanism also in a clock-wise direction. The connections of the cables 30′ and 32′ are such however that this rotation will elevate the barrier, at the same time returning the rock-shaft 19 to its normal position. The false rails are returned to the elevated central position by the spring 13 as soon as they are relieved from the wheel flange pressures. The function of the helical springs 29 and 29′ is to absorb the shock incident to elevating or lowering the barrier. It will also be seen that these springs will permit of both track mechanisms being operated at the same time, as in the passage of an exceptionally long train, without breaking the cables or otherwise straining the mechanism.

The function of the spring 34 is the same as that of the springs 29. As will be seen when the barrier 6 is in its lowered position the pull exerted upon either the cable 30 or 30′ will revolve the pulley 33, thus tightening the spring 34 and through it raising the barrier 6, the full strain of the barrier however is not thrown upon the cable at once, but is gradually increased as the spring 34 is tightened. With this construction the springs 29 may be entirely done away with if desired, although I prefer to use both the spring 34 and the springs 29, thus avoiding all possibility of breaking of the mechanism. It will thus be seen that the turning of either of the rock shafts will cause a corresponding turning of the other and therefore both rock shafts will be turned twice by the passage of a train. Because of this they will both be in the same position after the passage of the train in which they were in before its passage. It will of course be generally necessary to provide a duplicate crossing guard on the other side of the track, and it is obvious that this mechanism may be operated either independently of or in conjunction with the opposite guard as may be preferred.

Although we have shown and described the invention as being operated by cables it will readily be understood that the common or any preferred form of motion transmitting rods, such as those used in blockhouse switch control systems, may be substituted, in which case the pulleys 31 will be

replaced by bell-crank levers; and it is also obvious that if a rod is used only one connection will be necessary between the track mechanisms and the barrier since the rod will be capable of transmitting both compression and tension.

What we claim is:

1. In a railway crossing guard, in combination, a barrier adapted to close the crossing, a false rail secured to the track and adapted to be moved by the flange of a wheel passing over said track, a rock-shaft journaled beneath said track, a U-arm secured to said rock-shaft, a downwardly extended portion on said false rail adapted to engage one arm of said U with the passage of a wheel flange in one direction and to engage the other arm of said U with the passage of a wheel flange passing in the opposite direction and means for transmitting motion from said rock-shaft to said barrier.

2. In a railway crossing guard, in combination, a barrier pivoted on one side of the crossing and adapted to close the same, false rails disposed on either side of the crossing and parallel and adjacent to the inner tread of a line rail, means whereby the passage of a wheel flange over said rail will cause said false rails to move longitudinally and downwardly, the direction of longitudinal movement being dependent upon the direction of motion of the wheel, rock-shafts journaled beneath said false rails, U-arms secured to said rock-shafts, downwardly extended portions on said cross rails adapted to engage one arm of said U's with the passage of a wheel in one direction and the other arm with the passage of a wheel in the opposite direction, and means whereby similar rotation of said rock-shafts will cause oppositely directed rotations of said barrier.

3. In a railway crossing guard, the combination, of a barrier pivoted on one side of the crossing and adapted to close the same, a grooved pulley mounted for rotation upon the pivot bolt of the barrier, and provided with a pin engaging said barrier, a catch for locking said pulley against rotation, a lever for releasing said catch, false rails carried by the line rails on either side of said barrier, levers pivoted intermediate their length and operable by said false rails, cables connecting upper arms of said levers with the pulley, and cables connecting the lower arms of said levers with the catch releasing lever.

4. In a railway crossing guard, the combination, of a barrier pivoted on one side of the crossing and adapted to fall by gravity to close the same, means for cushioning the fall of said barrier, said means also assisting in raising the same, a grooved pulley mounted for rotation upon the pivot bolt of the barrier and provided with a pin engaging with said barrier, a catch for locking said pulley against rotation, a lever for releasing said catch, false rails carried by the line rails upon either side of said barrier, levers pivoted intermediate their length and operable by said false rails, cables connecting the upper arms of said levers with the pulley, and cables connecting the lower arms of said levers with the catch releasing lever.

5. In a railway crossing guard, the combination of a barrier pivoted on one side of the crossing and adapted to close the same, a grooved pulley mounted for rotation upon the pivot bolt of the barrier, means coacting with said pulley to engage with said barrier, means for locking said pulley against rotation, means for releasing said locking means, false rails carried by the line rails on either side of said barrier, levers pivoted intermediate their length and operable by said false rails, cables connecting the upper arms of said levers with the pulley, and cables connecting the lower arms of said levers with the lock releasing means.

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

GUY T. HARDENBURGH.
JAMES A. SCHROYER.

Witnesses:
LOU. I. HARDING,
A. W. JEFFRIED.