No. 671,372.

Patented Apr. 2, 1901.

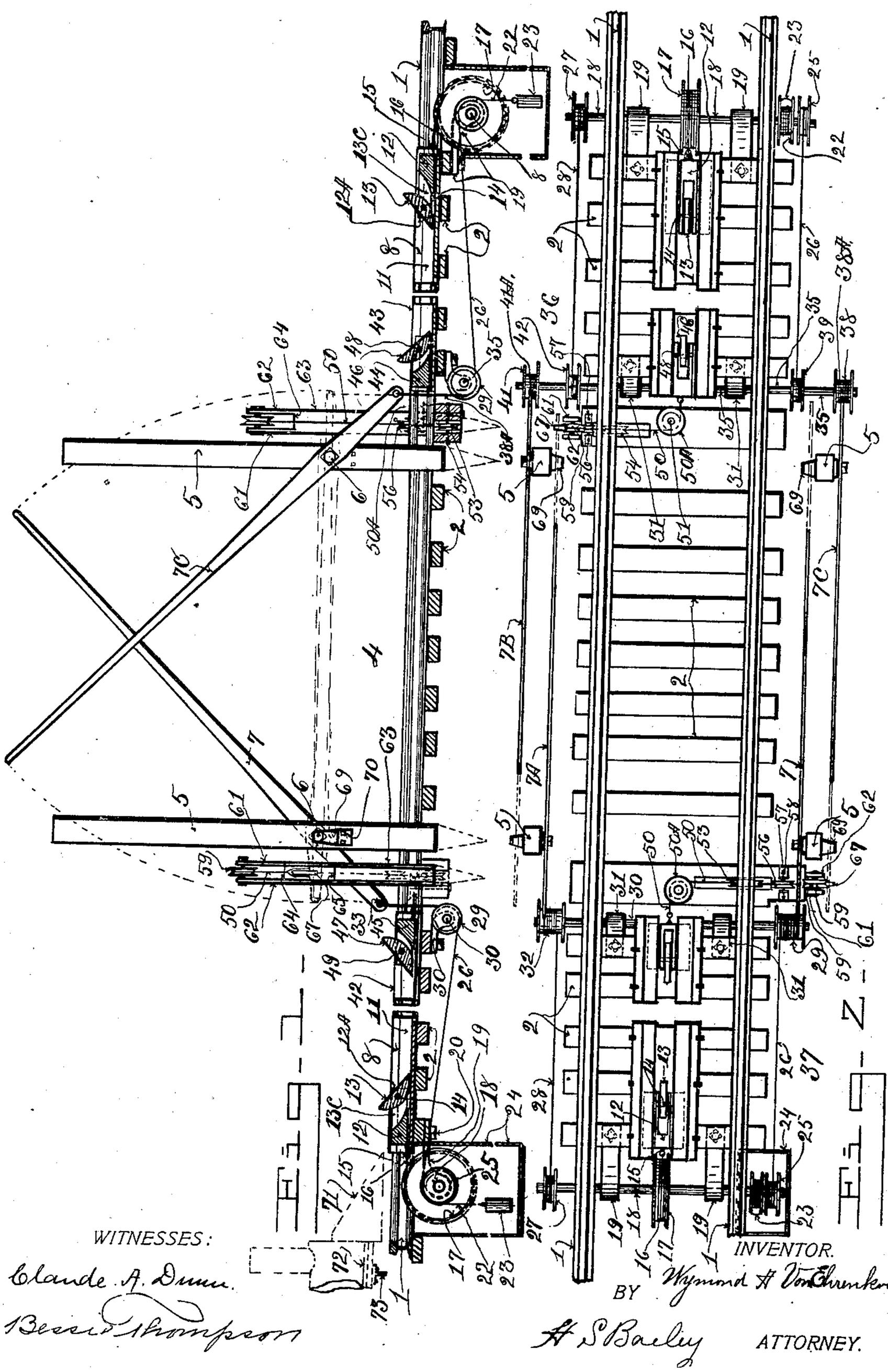
W. A. VON EHRENKROOK.

AUTOMATIC RAILWAY CROSSING GATE.

(Application filed May 7, 1900.

(No Model.)

2 Sheets—Sheet 1.



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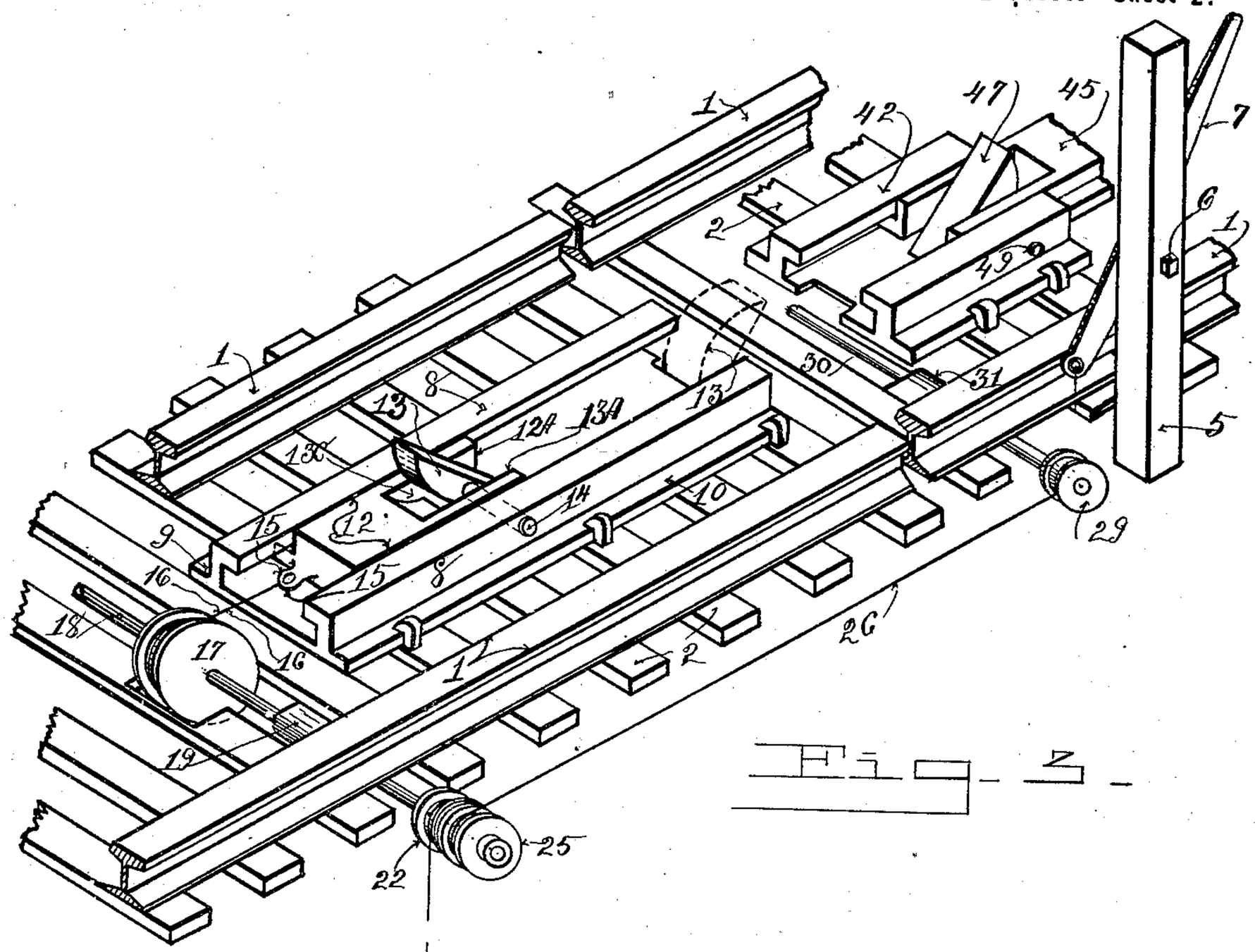

Fig. 2.

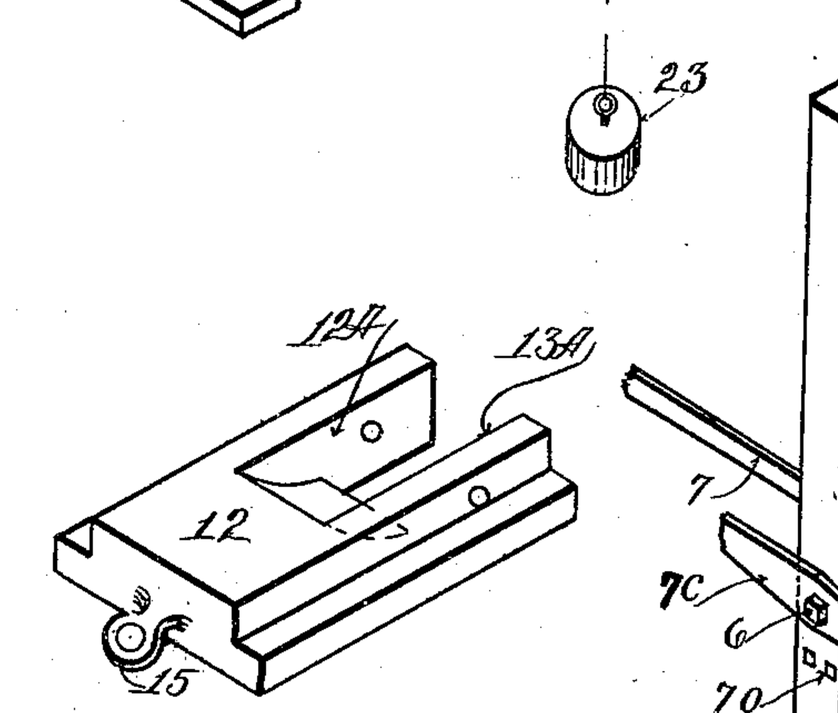

Fig. 5.

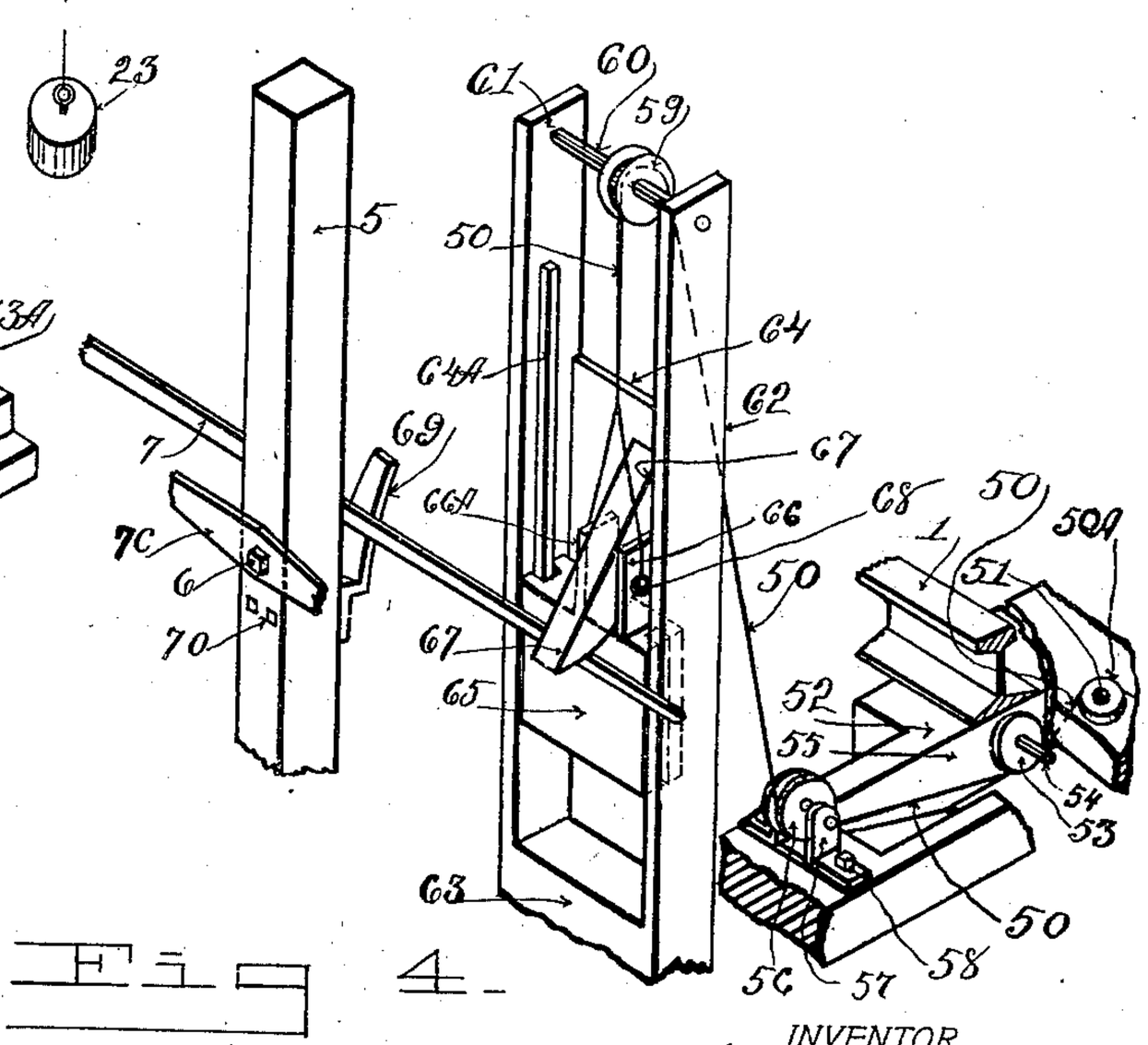

Fig. 4.

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AUTOMATIC RAILWAY-CROSSING GATE.

SPECIFICATION forming part of Letters Patent No. 671,372, dated April 2, 1901.

Application filed May 7, 1900. Serial No. 15,806. (No model.)

To all whom it may concern:

Be it known that I, WYMOND A. VON EHRENKROOK, a citizen of the United States of America, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Automatic Railroad-Crossing Gates; and I do 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, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in railway wagon-road-crossing gates; and the objects of my invention are, first, to provide a gate opening and closing mechanism that can be closed by an approaching and passing locomotive and that will open itself after a locomotive has passed; second, to provide a railroad road-crossing gate especially adapted for road-crossings which trains pass at high rates of speed; third, to provide a road-crossing gate that can be closed by a train and that will remain closed until the engine of a train has crossed the road; and, fourth, to provide a simple, durable, automatic, train-operating road-crossing gate for railroads. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side view, partially in section, of a section of a railroad and my automatic train-operating gate. Fig. 2 is a plan view of Fig. 1. Fig. 3 is a fragmentary perspective of a portion of my automatic gate. Fig. 4 is a fragmentary perspective of the gate-locking mechanism, and Fig. 5 is a perspective view of the sliding block.

Similar figures of reference refer to similar parts throughout the several views.

Referring to the drawings, the numeral 1 designates the rails, and 2 the cross-ties, of a railroad.

4 designates a wagon-road crossing, on each side of which and preferably on opposite sides of the track I place gate-posts 5. To each of these posts I pivotally secure by a bolt 6 a gate 7, 7^A, 7^B, or 7^C, which preferably consists of but a single pole, as shown. These poles are long enough to reach across the roadway and to extend beyond the posts a short distance.

In Figs. 1 and 2 I illustrate two gate-poles extending across the road from each side of it, one on each side of the track; but, if desired, only one gate-pole may be used on each side of a road.

On each side of the road and at a distance of from about two hundred and fifty to five hundred feet from it I secure to the cross-ties between the tracks a slideway 8, which preferably comprises a malleable or cast iron block having side flanges 9 and 10, by which it is spiked to the ties. The block contains through its center a T-slot slideway 11. This slideway is a number of feet long. In this slideway a T-shaped block 12 is mounted. The end of this block nearest the roadway is bifurcated and a crescent-shaped shoe 13 is pivotally mounted between its ends 12^A and 12^B on a bolt 14. This shoe is pivoted so that its lower end is the heaviest and normally bears on the bottom of the slideway, while its top end projects above the top of the block and back far enough to be struck by the cow-catcher of a locomotive. A recess 13^C is formed in the block for the shoe to tip back into when struck by a train going in the opposite direction from that in which the block slides. The opposite end of the block contains an eye 15, to which one end of a wire rope 16 is attached. The other end of this rope is coiled around and secured to a sheave 17, which is secured to and supported by a shaft 18. The shaft 18 is journaled in boxes 19, which are bolted to the cross-ties by bolts 20. This shaft extends under and beyond the rails and cross-ties and at its end a sheave 21 is secured, on which one end of a rope 22 is coiled and secured. A weight 23 is attached to the opposite end and depends into a box or hole 24. A sheave 25 is also secured to the shaft at the side of the sheave 21. One end of a wire rope 26 is coiled around and secured to this sheave. At the opposite end of the shaft 18 a similar sheave-wheel 27 is secured. One end of a rope 28 is secured to this sheave. The opposite end of the rope 26 extends to and coils around a sheave 29, that is secured to a shaft 30, which is journaled in boxes 31, attached to the adjacent cross-ties. This shaft extends under

the track beyond the opposite end of the ties, where a similar sheave 32 is secured to its end. The opposite end of the rope 28 is secured to and coiled around this sheave 32, and ropes 26 and 28 extend to the adjacent ends of the gate-poles 7 and 7^A, to which they are secured through holes 33 in their ends. These several ropes may be secured in any convenient manner to the several sheaves. A slideway, with its coöperating shafts and sheaves, is placed on the track on the other side of the roadway at about the same distance from the roadway, which will be engaged by trains coming the opposite way. The mechanism on each side of the roadway is exactly alike and the same reference-figures are used to designate them, except that shaft 35 is necessarily made longer than shaft 30, as the gate-poles 7^B and 7^C are placed outside the path of the gate-poles 7 and 7^A. This arrangement necessitates the placing of two sheaves 38 and 39 and 40 and 41 at the opposite ends of this shaft instead of the single sheaves 29 and 32 on the shaft 30. The ropes 38^A and 41^A are then coiled around and secured to the sheaves 38 and 41 and extended to and secured to the end of the poles 7^B and 7^C. This arrangement is shown only in Figs. 1 and 2.

The mechanism I have just described operates to close the gate when a locomotive crosses the roadway from either direction, but as this mechanism is placed quite a distance up and down the track the gate-poles would commence to rise again after they had been lowered by a coming train before the engine reached the crossing. Consequently in order to keep the gates down it is necessary to provide some means for locking them when down until the engine of a train has crossed the road. I prefer to do this in the following manner: Close to the roadway and on each side of it I place between the rails on the cross-ties short slideways 42 and 43, which are similar to the slideways used for the gate mechanism. In these slideways blocks 44 and 45 are fitted, which are also similar in construction to those used in the gate-operating slideways, and in the blocks crescent shoes 46 and 47 are pivotally supported by pins 48 and 49. From each block a rope 50 extends around a pulley 50^A, which is supported in a horizontal plane by a bolt 51 to a cross-tie 52. From this pulley the rope runs to a pulley 53, which is pivoted by a bolt 54 in a slot 55 in said cross-tie under the rail. (See Fig. 4.) From this pulley the rope runs under a pulley 56, supported by a bracket 57, which is secured to the cross-tie. From this pulley the rope extends to a pulley 59, which is supported by a shaft 60 in the sides 61 and 62 of the locking-post 63. A plank 64 extends across the side of post 63, facing the track toward the top of the post a portion of its height, leaving a clear space above it between the sides. Between this plank and the opposite edges of the sides there is a projecting slideway-strip 64^A, on which a cross-head 65 is slidably mounted. Two projections 66^A and 66 extend upward from the top of the cross-head, between which a crescent-shaped latch 67 is pivoted by a pin 68. The top end of this crescent latch is made longer and heavier above the pin 68 than its lower end, so that it tips back naturally against the partition, while its lower end projects out beyond the face of the post several inches. The rope 50 extends over the pulley 59 and is divided, and its ends are secured to the opposite ends of the pin 68. The cross-head and latch are enough heavier than the block and shoe in the slideway on the track to hold them normally back close to the horizontal pulley and in the adjacent end of their slideway.

As the posts and cross-heads and the latch are arranged identically the same on each side of the roadway, I have marked them with the same designating characters, and the above description applies to both. The gate-pole-supporting posts are each provided on their sides opposite that to which a gate-pole is secured with a keeper 69, which is secured to the post by a bolt 70, and the posts on one side of the roadway are so arranged that the gate-pole of each post will fall into the keeper of the opposite post, and the posts 63 are set so that their latches will project into the paths of the falling gate-poles, so that these poles will strike their projecting ends and move them back and pass by them, when they will move instantly out over the end of the gate-poles and hold them down. But two locking-posts are required, one for each set of gates, and they are arranged on opposite sides of the track and of the roadway, so that the engine of a train will cross the roadway before the gate is released and commences to rise.

The operation of my invention is as follows: When the cow-catcher 71 of an engine 72 (a fragment of which is shown in dotted lines in Fig. 1) comes along the track, it strikes the upwardly-projecting end of the crescent shoe 13 of the block 12 and pushes it and its block along the slideway to its end, unwinding the rope from the sheave 17 and winding up the rope 22 and raising the weight 23 and at the same time unwinding the ropes 26 and 28, which as they unwind from the sheaves 29 and 30 allow the gate-poles 7 and 7^A to lower. When the crescent shoe has been pushed to the end of the slideway, its lower end drops off between the cross-ties, which allows its upper end to turn over, as shown in dotted lines in Fig. 3, and down under the cow-catcher, which then passes over it. The block and shoe then stop, and the gate-poles are then down in a horizontal position, and one is locked to the opposite locking-post, as the length of the slideway, which may be from twenty to fifty feet, and the diameters of the sheaves used are proportioned to give only sufficient downward movement to the gate-poles to lock them to their locking-post. The gates 7 and 7^A are then locked, and the train passes along the several hunded feet between

the slideway and the road and crosses the road, and the cow-catcher engages the crescent shoe of the block of the slideway of the locking-post and slides the block along to the end of its slideway, where the shoe turns over in the same manner as the one above described. This draws the rope as it moves through the slideway with it and raises the cross-head and locking-latch of the locking-post up close to the pulley, as the length of this slideway and movement of the block are proportioned to do this. When the crescent latch reaches the clear space above the plank, its upper end tips over and down and is assisted in this movement by the gate-pole itself, which is under a lifting pressure from the weight 23, which is heavy enough to draw the block 12 back and to raise the gate-poles whenever the weight of the cross-head of the locking-post is relieved. Consequently when the engine strikes the shoe of the locking-post and raises its cross-head and latch the gate-pole follows it up, and when the latch tips over it is released, and its own weight 23 raises it and its opposite gate and also draws the block 12 back to its normal position, while after the engine leaves the shoe of the locking-post the weight of its cross-head will draw it and its block back to its normal position, and the latch will right up and slide down its partition. Instead of the cow-catcher's striking the shoes a bracket 73 could be secured to some convenient part of the engine, so that it would engage the shoes either way the engine was going, whether backward or ahead. After the engine leaves the first slideway as it meets the locking-post slideway and shoe of the mechanism for closing the opposite gates for trains coming from the opposite direction it also strikes the top of this shoe, but moves or tips it down into its recess back of and under it in the block. The engine also strikes the top of the shoe 12 of the opposite gate mechanism and tips it down in its recess and passes on. Both shoes immediately move back into their normal position.

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

1. In a railway-crossing gate, the combination of supporting-posts on opposite sides of the roadway, vertically-swinging gate-poles pivotally attached near one end to said posts in a position to allow their long ends to extend over the roadway and their short ends to extend beyond the posts, a slideway secured to the cross-ties of the track between the rails at a distance from the roadway, a block slidably mounted in said slideway, a shoe pivotally mounted in one end of said block with its lower end on said slideway and its upper end projecting above said slideway into the path of a locomotive-engine, a shaft journaled in suitable boxes secured to said cross-ties, a sheave secured to said shaft, a rope coiled around and secured at one end to said sheave and extending to and secured at its opposite end to said block, a second sheave on said shaft, a rope coiled at one end on said sheave and secured thereto, a weight depending from the opposite end of said rope, a sheave secured to said shaft adjacent to said weight-supporting sheave, a shaft extending under the track and close to said gate-supporting post and supported in suitable bearings, a sheave secured on said shaft in line with the short end of said gate, a rope secured at one end to and coiled around the sheave at the side of the weight-supporting sheave and extending to and coiled around the sheave under the end of said gate-pole and extending from that sheave and connected to the short end of said gate-pole, substantially as described.

2. In a railway-crossing gate, the combination of supporting-posts on opposite sides of the roadway, vertically-swinging gate-poles pivotally attached near one end to said posts in a position to allow their long ends to extend over the roadway, and their short ends to extend beyond the posts, a slideway secured to the cross-ties of the track between the rails at a distance from the roadway, a block slidably mounted on said slideway, a shoe pivotally mounted in one end of said block with its lower end on said slideway and its upper end projecting above said slideway into the path of a locomotive-engine, a shaft journaled in suitable boxes secured to said cross-ties, a sheave secured to said shaft, a rope coiled around and secured at one end to said sheave and extending to and secured at its opposite end to said block, a second sheave on said shaft, a rope coiled at one end on said sheave and secured thereto, a weight depending from the opposite end of said rope, a sheave secured to said shaft adjacent to said weight-supporting sheave, a shaft extending under the track and close to said gate-supporting post and supported in suitable bearings, a sheave secured on said shaft in line with the short end of said gate, a rope secured at one end to and coiled around the sheave at the side of the weight-supporting sheave and extending to and coiled around the sheave under the end of said gate-pole and extending from that sheave and connected to the short end of said gate-pole, a locking-post on each side of the roadway close to the lowering-path of said gate-poles, a vertically-reciprocating latch-shoe normally arranged to be engaged by and to lock over an engaging gate-pole and arranged to release said gate-pole on its upward movement, a slideway on the track adjacent to said post, a sliding block in said slideway, a tipping-shoe pivotally attached to said sliding block and arranged to be engaged by a passing engine or train, a sheave on said locking-post above said post's latch-shoe and means including a suitable, flexible connection for operatively connecting said latch with said sliding block and tipping-shoe, substantially as described.

3. In a railroad-crossing gate, the combina-

tion of posts at the sides of the roadway, with the slideway secured to the cross-ties between the rails, the sliding block reciprocately mounted in said slideway, the shoe pivotally mounted in said block arranged and adapted to be engaged by passing locomotives and moved in one direction of its reciprocative movement, and means including suitably-disposed shafts and sheaves and ropes connecting said sliding block to said gate-poles for raising and lowering the gate-poles by the movement of passing locomotives and trains, a short slideway at each side of said roadway, a block reciprocately mounted in said slideway, a shoe pivotally mounted in one end of said block and adapted to bear on said slideway at one end and to be engaged at its opposite end by passing engines or trains, two posts at diagonally opposite corners of the crossing close to the paths of the outer ends of their coöperating gate-poles, a vertically-sliding block on each post, a crescent-shaped shoe pivoted to each block and arranged and adapted to stand at a downward-diverging angle with the post and with its lower end projecting into the path of its coöperating, lowering gate-pole and adapted to be engaged by and to latch over said gate-pole, a sheave at the top of said post, a rope passing over said sheave and connected at one end to said block and at its opposite end to the sliding block of said slideway, suitable supporting-sheaves intermediate of said slideway and locking-post for operatively guiding said rope under the adjacent rail and means including the operative movement of said sliding block, and its crescent shoe and said vertically-moving block for releasing said gate-pole from said locking-post, substantially as described.

4. In a railroad-crossing gate, the combination of the posts and the gate-poles, the slideways on the track, the sliding blocks in said slideways, the shoes in said blocks, the shafts, the sheaves, the ropes and the weights operatively connecting gate-poles and sliding blocks, with the locking-post, the slideway arranged thereon, the vertical reciprocating block mounted on said slideway, the crescent-shaped latch, the plank at the back of said latch, the rope extending from said block to said sliding block in the coöperating track-slideway and the sheaves arranged on the cross-ties and operatively guiding and supporting said rope, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

WYMOND A. VON EHRENKROOK.

Witnesses:

CLAUDE A. DUNN,

BESSIE THOMPSON.