No. 658,036. Patented Sept. 18, 1900.

C. R. WOODWARD.

GATE FOR RAILWAY CROSSINGS.

(Application filed July 26, 1899. Renewed Apr. 20, 1900.)

(No Model.) 3 Sheets—Sheet 1.

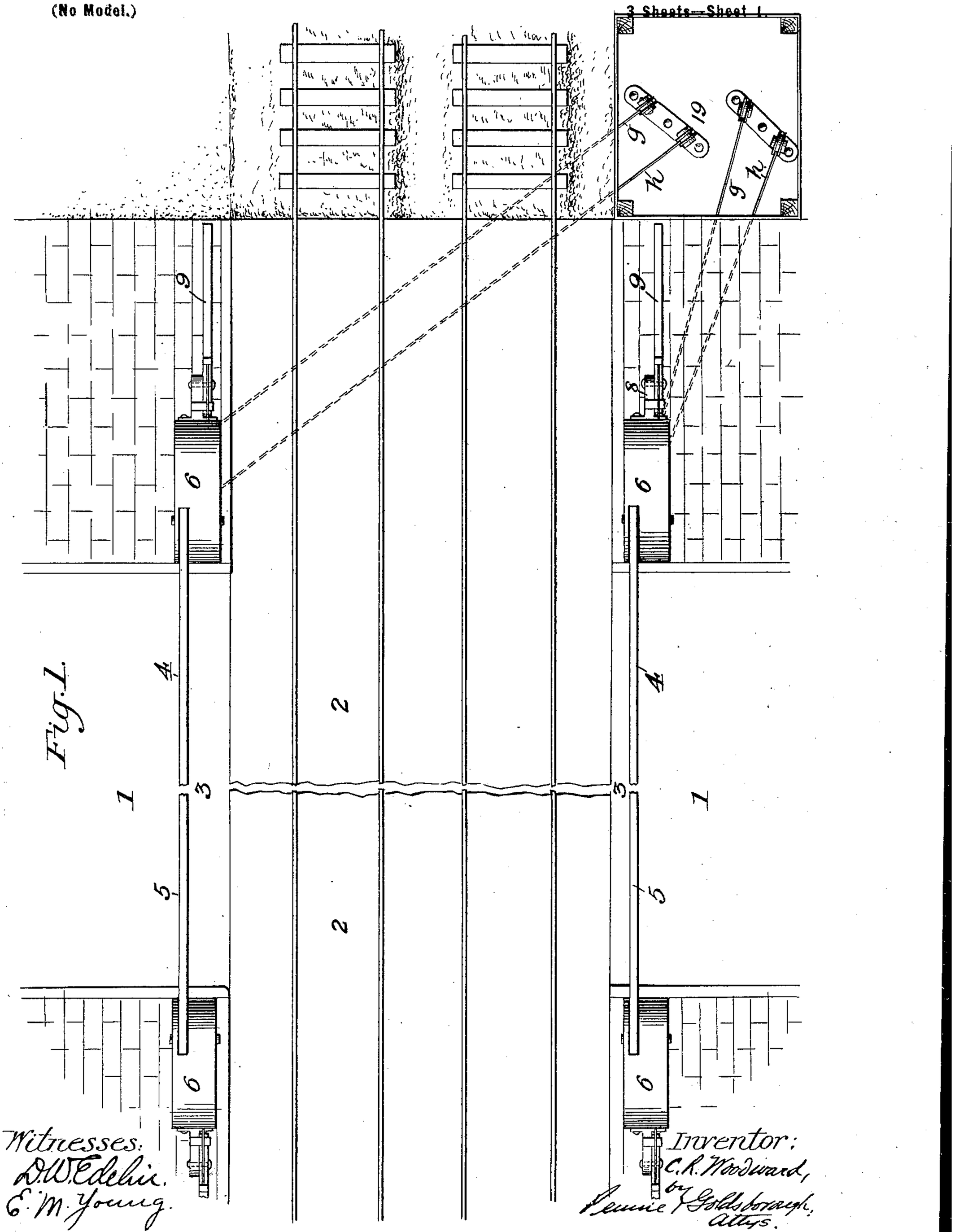

Fig. 1.

Witnesses:
D. W. Edelin.
E. M. Young.

Inventor:
C. R. Woodward,
by Lemuel Goldsborough,
Attys.

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(No Model.) 3 Sheets—Sheet 2.

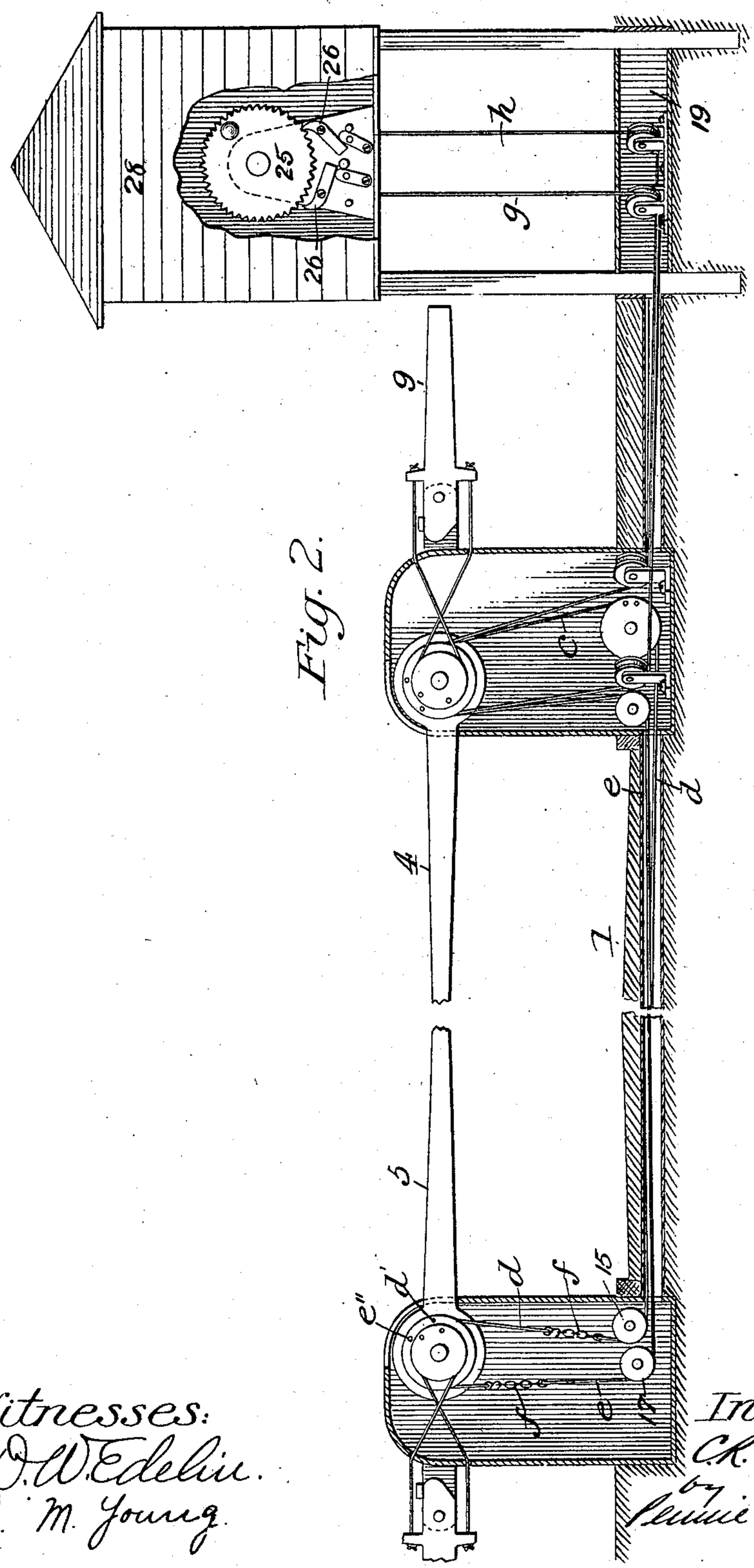

Fig. 2.

Witnesses:
D. W. Edelin.
E. M. Young.

Inventor:
C. R. Woodward,
by Pennie & Goldsborough,
Attys.

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C. R. WOODWARD.

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(No Model.) 3 Sheets—Sheet 3.

Fig. 4.

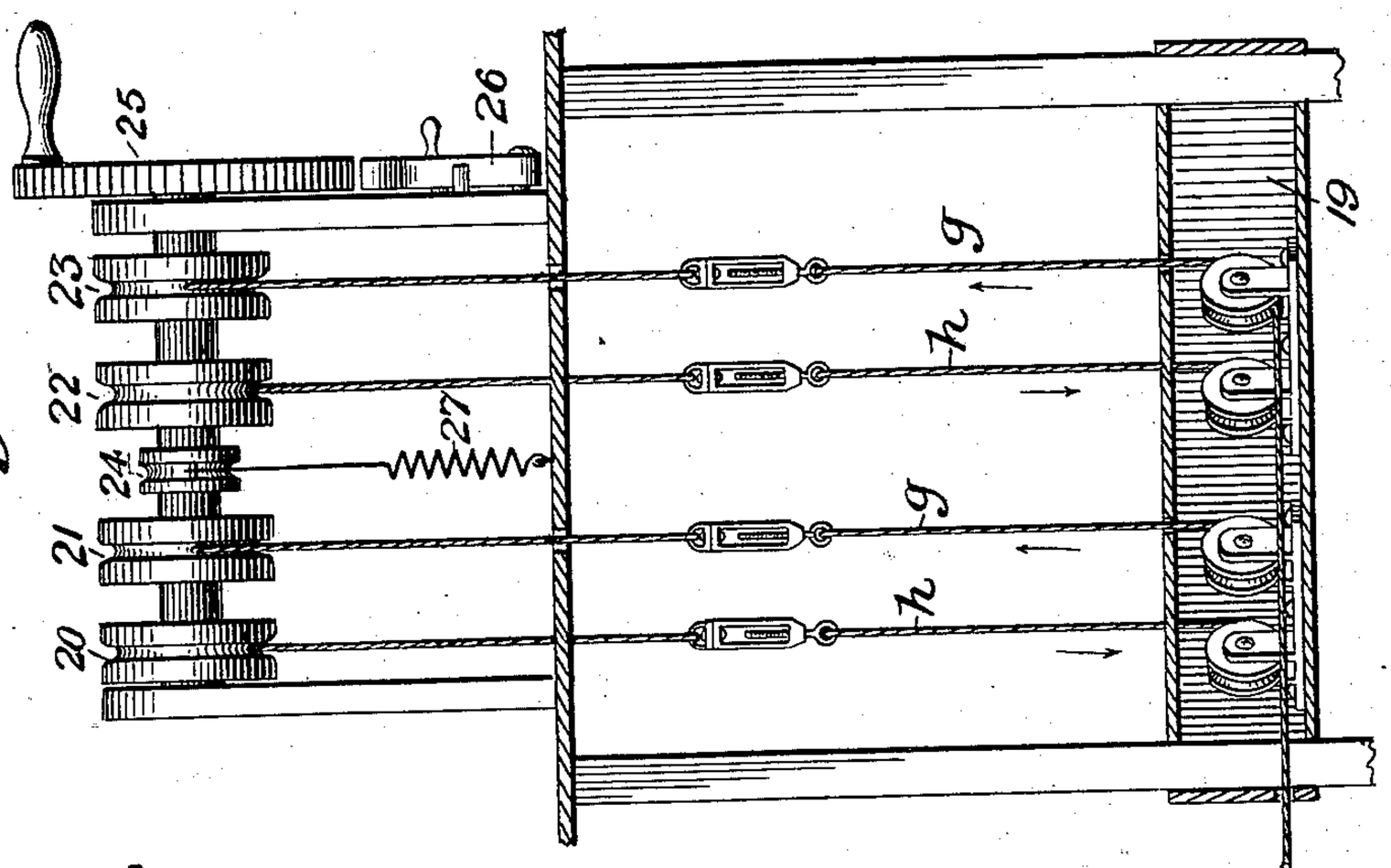


Fig. 3.

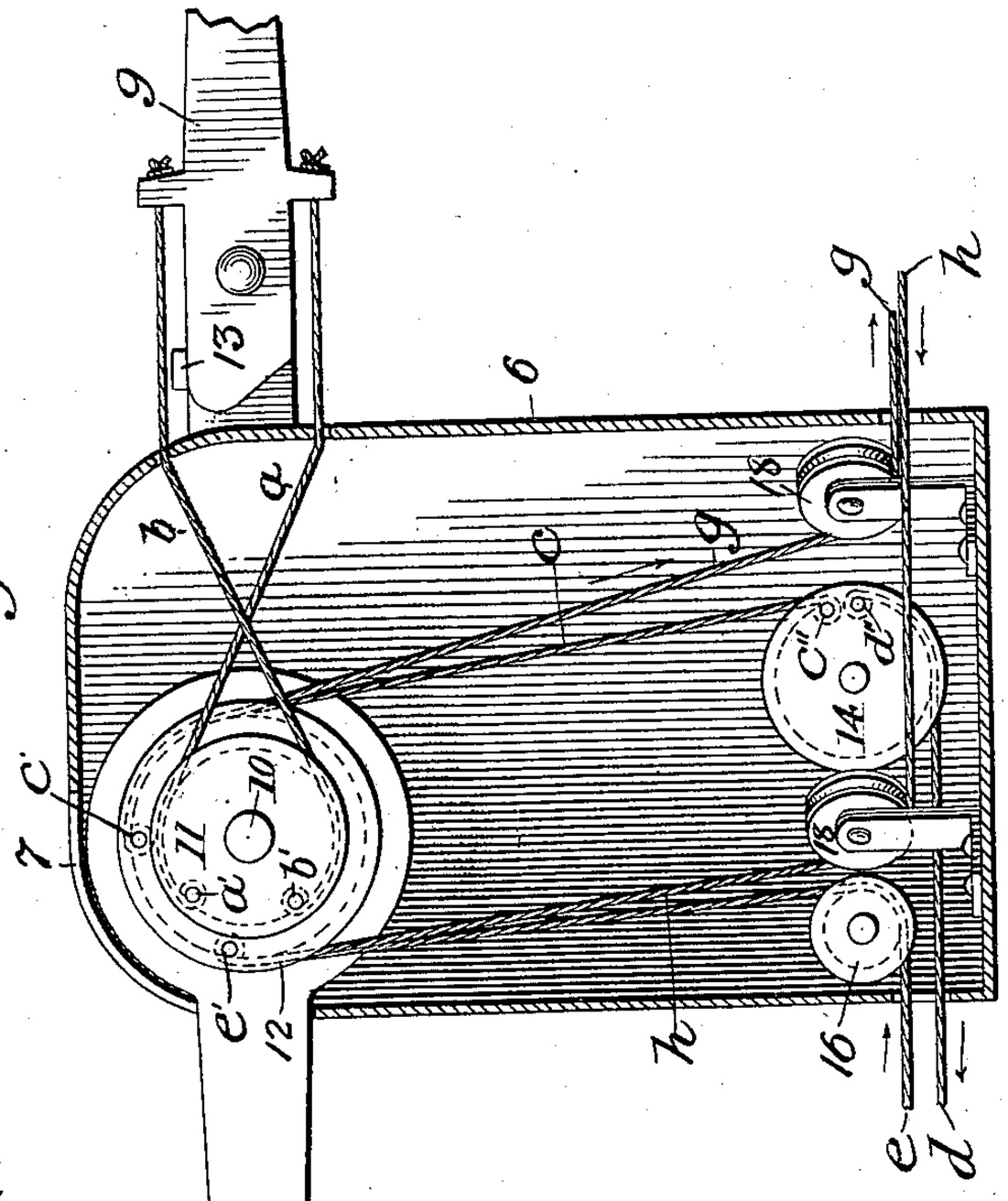
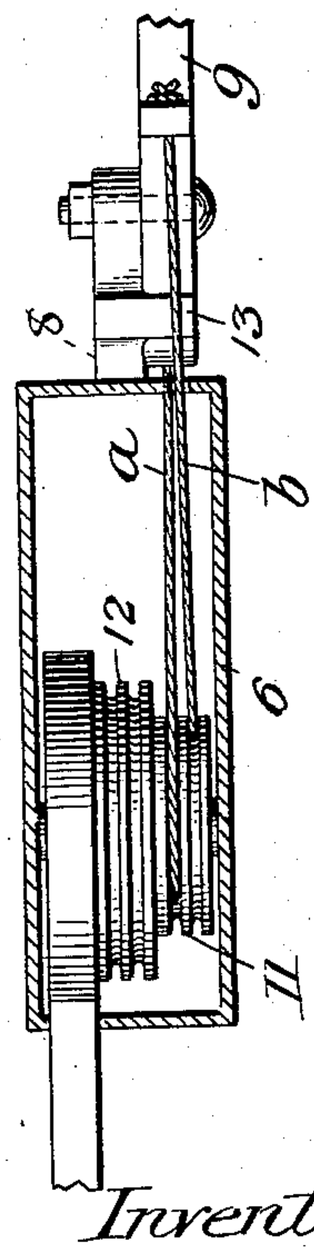


Fig. 5.



Witnesses:
D. C. Edelin.
E. M. Young.

Inventor:
C. R. Woodward,
by Dennis & Goldsborough
Attys

UNITED STATES PATENT OFFICE.

CHARLES R. WOODWARD, OF CAMPBELL, NEW YORK.

GATE FOR RAILWAY-CROSSINGS.

SPECIFICATION forming part of Letters Patent No. 658,036, dated September 18, 1900.

Application filed July 26, 1899. Renewed April 20, 1900. Serial No. 13,648. (No model.)

To all whom it may concern:

Be it known that I, CHARLES R. WOODWARD, a citizen of the United States, residing in Campbell, county of Steuben, and State of New York, have invented certain new and useful Improvements in Gates for Railway-Crossings; and I 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.

This invention relates to that kind of railway-crossing gates in which the gate-bars are pivoted to swing in a vertical plane, and is more especially directed to improvements in cable-operating mechanism, whereby the lowering of such gates is rendered easy and certain and the friction necessarily involved in this form of operating means reduced to a minimum.

The invention is also directed to improvements generally in railway-gates and to the avoidance of such errors as have heretofore rendered such safeguards inefficient in operation.

I have illustrated the invention in the accompanying drawings, in which—

Figure 1 represents a plan of the intersection of a street or road and a railway with my gates located thereat. Fig. 2 represents a section of a set of gates for one side of the track and their connecting devices and shows also the operating-station, disclosing the interior thereof. Fig. 3 represents an elevation of the interior of a gate-stand, on an enlarged scale, showing the pulleys and cables. Fig. 4 represents the operating devices; and Fig. 5 represents a horizontal section through the gate-stand, showing the gate-pulley and its connection with the sidewalk-guard.

Like characters refer to like parts throughout the several views.

1 indicates the roadway, and 2 the railway-tracks, the gates 3 being located on each side of the railway-track.

Each gate consists of two gate-bars 4 and 5, pivoted in standards 6. The bars 4 and 5 are of such length as to extend about halfway across the roadway, and their inner ends are rounded and inclosed in the standards, projecting through an opening 7 in the top and side thereof. The standards 6 are of the usual box-like construction, accommodating the various pulleys and cables and having a projecting arm 8, to which is pivoted the sidewalk gate or guard 9. These standards are designed to extend into the ground, having openings in their sides through which the operating-cables may enter. As these cables extend in a subway from the operating-station to the standards, all the parts of this gateway are protected from accident and from the weather.

Each gate-bar is journaled at 10 in its standard, and to the shaft of each are secured two pulleys 11 and 12, the former being somewhat smaller than the latter. On opposite sides of the axis of the pulley 11 at a' and b' cables a and b are secured, one in each groove of said pulley. These cables cross each other, as shown, and extend through openings in the standard 6, their ends being secured to lugs on the sidewalk-guard 9. When the gate-bar is turned up or down, the sidewalk-guard moves up or down also, owing to the cross cable connection between the two. The gate-bar is limited in its vibration by the extremities of the slot 7, while the sidewalk-guard has a heel which strikes a lug 13 on the arm 8 and determines its downward swing. This heel is rounded to serve as a guide for the cable when the sidewalk-guard is elevated.

The pulleys 11 and 12 are preferably double pulleys—*i. e.*, they have two grooves. The pulleys 12 of the gate-bars 4 and 5 are connected by means of cables c, d, and e, the last two being adjustable in length by having a chain and hook f or some equivalent adjusting device interposed in their length. These cables extend through a passage beneath the roadway in the usual manner and are crossed in this passage, so that the gate-bars will move in opposite directions. If desired, all the pulleys may be double.

The arrangement of the cables c, d, and e is an important feature of my invention, since much of the frictional resistance is dependent thereupon, and my device lessens this resistance in a material degree. The cable c is short and extends from a fixed point c' in the inner groove of the pulley 12 of gate-bar 4 to a fixed point c'' in the inner groove of a fixed guide-pulley 14. The cable d extends from

a fixed point d'' in the outer groove of the pulley 14 through the subway, around guide-pulley 15, to a fixed point in the outer groove of double pulley 12, attached to gate-bar 5, and the cable e extends from a fixed point e' in the inner groove of pulley 12 on the opposite side of the axis of the pulley from the cable c around guide-pulley 16, through subway, (crossing cable d therein,) thence around guide-pulley 17 to outer groove of pulley 12 on the opposite side from cable d on gate-bar 5, where it is secured at e''. By the use of the double pulley 12 on the bar 5 the cables d and e will not touch each other, and thus the friction and wear caused thereby will be obviated. This is also the reason for the use of the double pulley 14; but it will be understood that single pulleys may be used at 14 and on the gate-bars 5. In such case, however, care must be taken that the cables c and d and d and e do not touch, and this can only be the case when the pulleys in question never make a complete revolution. In case pulley 14 is so small, however, as to have its revolution multiplied on account of the greater size of the operating-pulley 12 of the gate-bar 4 it should have two grooves.

Each gate 3 includes two gate-bars 4 and 5, and the pulleys 12 on the former are the main operating-pulleys, not only being connected to the pulleys 12 on the gate-bars 5, but also with the operating mechanism in the station. From the inner groove of each pulley 12 of the gate-bars 4 two cables g and h extend on opposite sides of the pulley, the same being attached at convenient points, preferably in line with the points e' and c' in the adjacent groove. Thence these cables extend around guide-pulleys 18, through an opening in the standards, through a subway into a box 19 below the station, where they pass around guide-pulleys, and upwardly therefrom to an operating-windlass in the station. This windlass consists of two uprights on a platform in the station supporting a single shaft on which are fixed four pulleys 20 21 22 23, a central pulley 24, and a toothed or ratchet wheel 25, having a handle. The wheel 25 is on the outside of one of the uprights, and on the side of this upright are arranged two pawls or dogs 26, which when in engagement with the teeth of the wheel 25 prevent said wheel from rotating under the influence of the gates. The pawls may be applied either singly or together, thus either preventing the gate from being thrown either up or down by exterior means or holding it in any position.

The cables g and h are attached to the pulleys 20, 21, 22, and 23, each to each, the cable h being attached to its pulley on the side opposite to that of the attachment of the cable g. By the use of a separate pulley for each cable friction between the cables is avoided, and by the relative manner of attaching the cables a positive motion is given to the gates, whether they are thrown up or down. Thus the unbalanced weight of the gate is not depended upon to carry it down. In fact, it may be evenly balanced, weights being unnecessary in this construction. They are useful, however, necessitating less power than unweighted gates.

The operating-station 28 is located upon one side of the railway and may be elevated, so that the operator may have an unobstructed view. A subway connects the box 19 with the standard 6 upon the opposite side. The cables passing therethrough are shown in dotted lines in Fig. 1. With this construction it will be seen that to extend the gates across the roadway it is simply necessary to turn the windlass in one direction, a positive pull being exercised on the cables h and the gate-bars lowered. A reverse motion of the windlass will positively elevate the gates. The spring 27, attached to the collar 24 and to the platform, tends to retain the gates in their elevated position, allowing the shaft to be readily turned by the operator, however.

The cables g and h have interposed in their length turnbuckles, by means of which they may be lengthened or shortened when desired.

By the above-described construction the gates are positively operated in either direction, and changes in temperature do not affect the operating devices, as they are positively attached to the pulleys and do not depend upon a taut rope to give sufficient friction. A taut rope in winter becomes slack and practically inoperative in summer, and sudden changes in temperature may cause serious accidents, owing to inability to operate the gates before adjustment. None of these disadvantages are pertinent to my construction.

An important advantage of my construction is its freedom from many frictional resistances heretofore present in cable-actuated railway-gates, necessitating less power in its operation.

Having thus described my invention, what I claim is—

1. In a railway-crossing gate, the combination of a pivoted gate-bar for the roadway, an oppositely-extending pivoted gate-bar for the sidewalk, and operating ropes or cables extending from the roadway-gate on opposite sides of its axis to the sidewalk-gate on opposite sides of its axis, said cables being crossed so as to cause the gates to move in opposite directions.

2. In a railway-crossing gate, the combination of a pivoted gate-bar on one side of the roadway, a similar bar on the opposite side of said roadway, oppositely-extending pivoted gate-bars for each sidewalk, ropes or cables connected at their opposite ends to the roadway gate-bars on opposite sides of their axes so as to cause them to swing in opposite directions, and ropes or cables connected at opposite ends to said roadway-gates and to said sidewalk-gates, said cables being crossed so as to cause each sidewalk-gate to move in the opposite direction to its roadway-gate.

3. In a railway-crossing gate, the combination of pivoted gate-bars on each side of the roadway, pivoted gate-bars on one side of each sidewalk, operating ropes or cables connecting the roadway gate-bars together on opposite sides of their axes, crossed ropes or cables connecting the sidewalk gate-bars with the bars of the roadway-gates, an operating-station located in proximity to the crossing, a shaft at said station and ropes or cables extending from said shaft to one of the roadway gate-bars whereby both the said bars and both the sidewalk-bars are operated.

4. In a railway-crossing gate, the combination of pivoted gate-bars on each side of the roadway, pivoted gate-bars on one side of each sidewalk, operating ropes or cables connecting the roadway gate-bars together on opposite sides of their axes, crossed ropes or cables connecting the sidewalk gate-bars with the bars of the roadway-gates, an operating-station located in proximity to the crossing, a shaft at said station, and ropes or cables extending from opposite sides of said shaft to one of the roadway gate-bars whereby both the said bars and both the sidewalk-bars are operated positively in both directions.

5. A railway-gate comprising a pivoted sidewalk gate-bar, a pivoted roadway gate-bar, and flexible means connecting each side of the latter opposite its pivot with the other side of the former opposite its pivot, in combination substantially as described.

6. In a railway-gate, the combination of a standard, a roadway gate-bar pivoted thereto, and provided with a pulley, a sidewalk gate-bar also pivoted thereto, and flexible connections secured to the pulley, extending therefrom on opposite sides of the pivot and secured to opposite sides of the sidewalk gate-bar, said connections crossing each other intermediate the pivots, substantially as described.

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

CHARLES R. WOODWARD.

Witnesses:
D. J. SUNDERLIN,
CHAS. N. SUNDERLIN.