

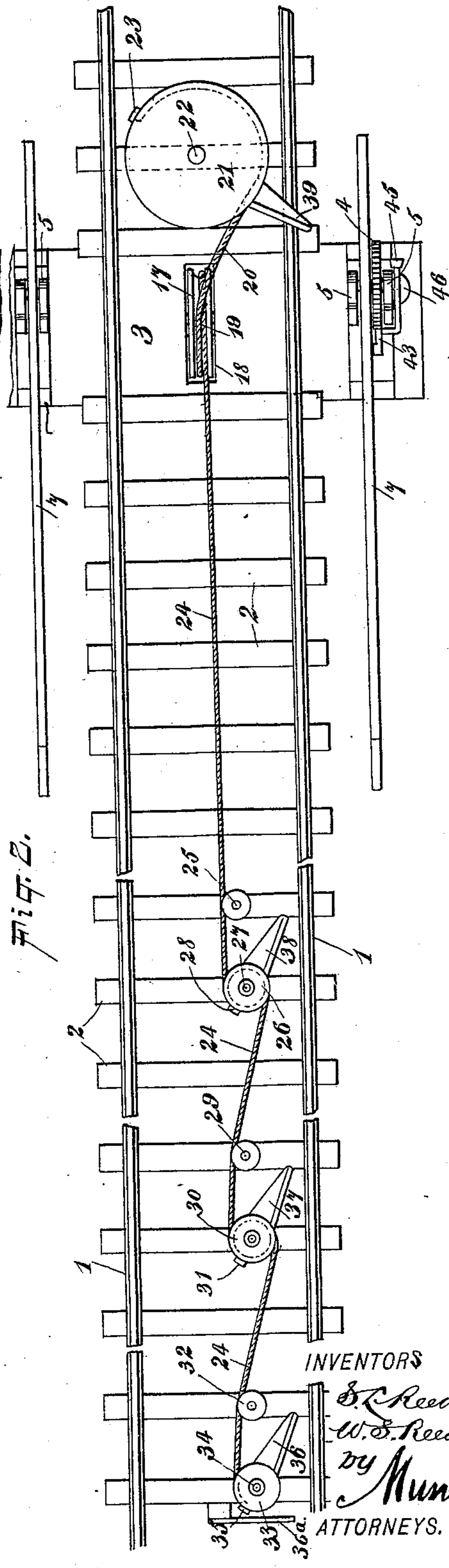
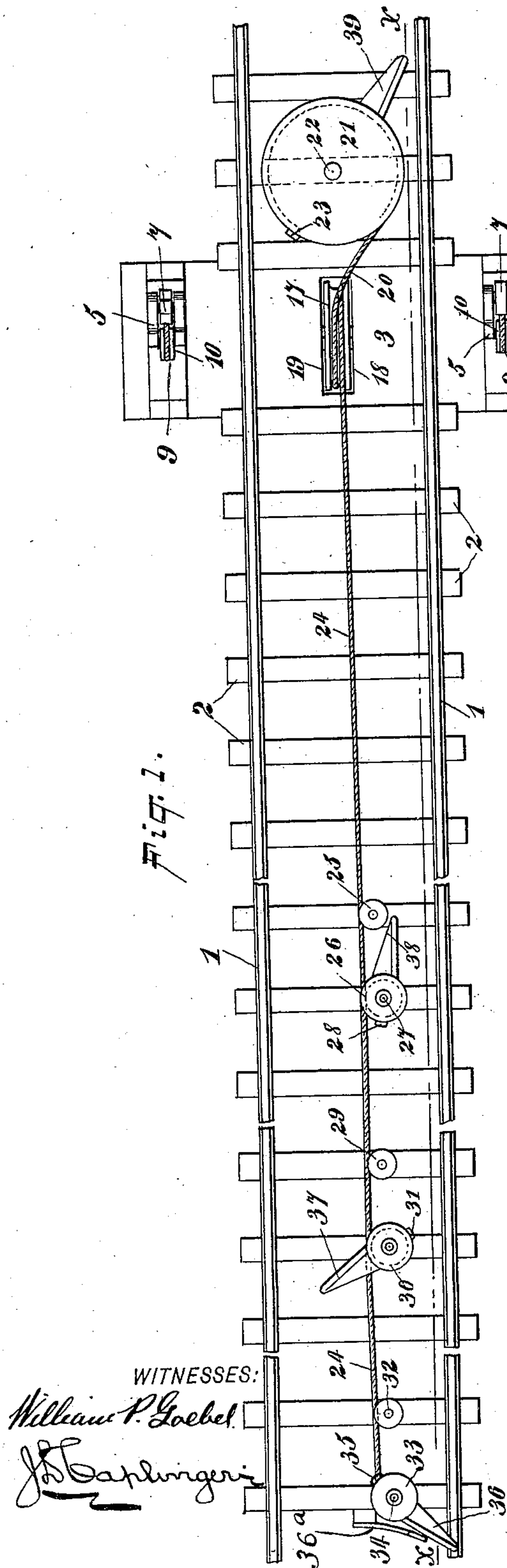
(No Model.)

2 Sheets—Sheet 1.

S. L. & W. S. REED.  
RAILWAY GATE.

No. 556,211.

Patented Mar. 10, 1896.



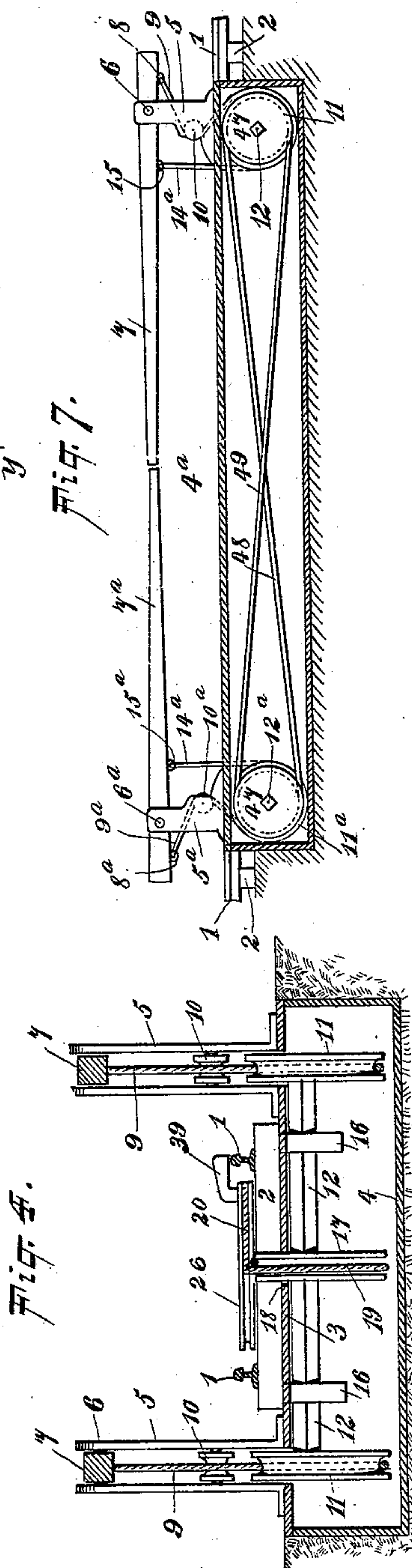
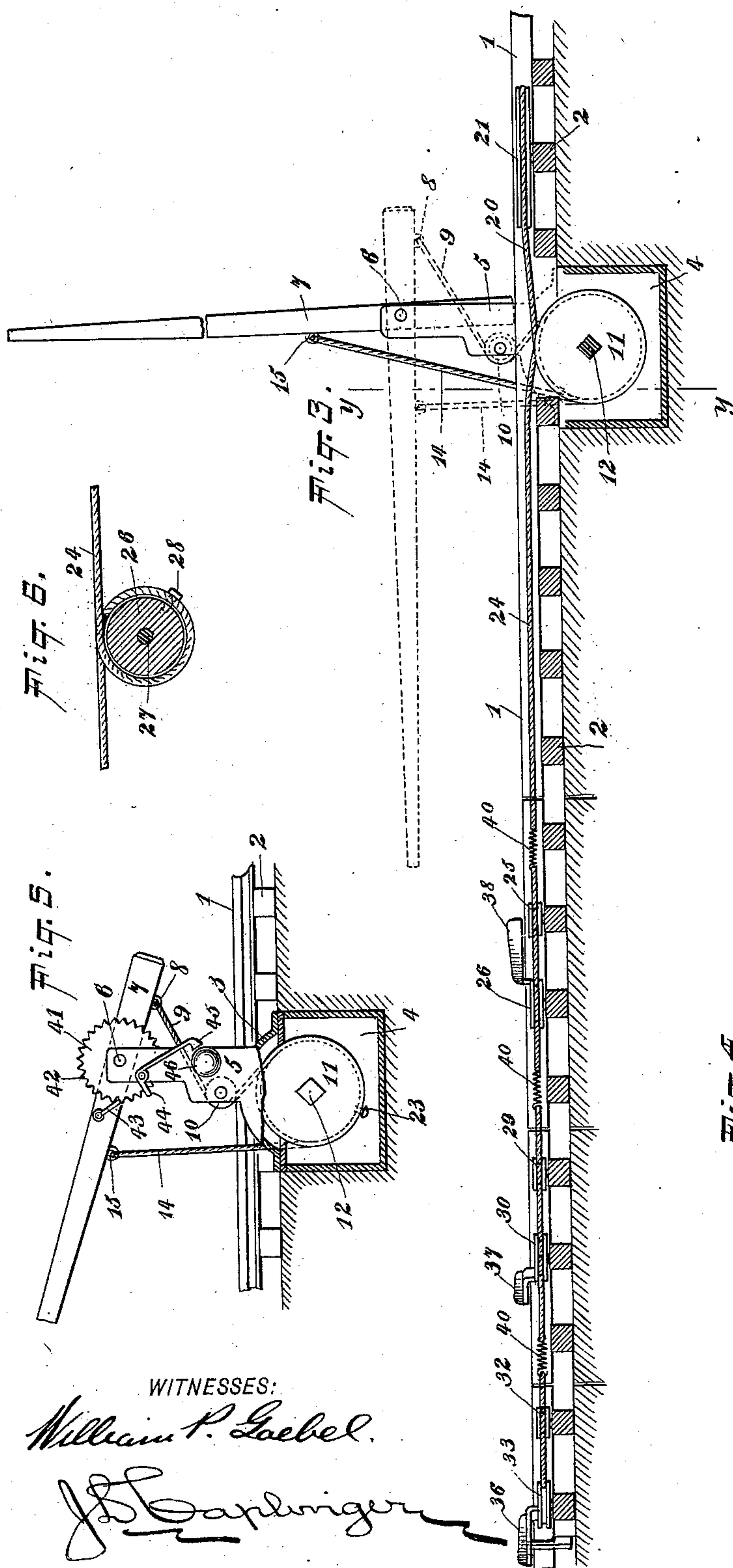
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**INVENTORS**

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# UNITED STATES PATENT OFFICE.

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## RAILWAY-GATE.

SPECIFICATION forming part of Letters Patent No. 556,211, dated March 10, 1896.

Application filed July 18, 1895. Serial No. 556,403. (No model.)

*To all whom it may concern:*

Be it known that we, SAMUEL L. REED, of Ebensburg, and WILLIAM S. REED, of Johnstown, in the county of Cambria and State of Pennsylvania, have invented certain new and useful Improvements in Railway-Gates, of which the following is a full, clear, and exact description.

This invention relates to certain improvements in railway-gates, such as are employed at crossings, &c., to close the roadway on the approach and passing of a train, and the object of the invention is to provide a device of this character of a simple and inexpensive construction which shall be adapted to be actuated automatically by the train as it approaches the crossing in such a way as to close the gates, the device being so arranged that the gates are also automatically opened when the train has passed the crossing.

The invention contemplates certain novel features of construction and combinations and arrangements of the various parts of the improved gate whereby certain important advantages are attained and the device is made better adapted for use than other gates heretofore employed, all as will be hereinafter fully set forth.

The novel features of the invention will be carefully defined in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan view of a railway-crossing gate constructed in accordance with our invention, the parts being shown in the positions occupied by them when the gate is open. Fig. 2 is a similar view, but showing the several parts in the positions they assume when the gate is closed. Fig. 3 is a sectional side elevation of the gate, the parts being shown in the position seen in Fig. 1, the plane of the section being indicated by the line  $xx$  in Fig. 1. Fig. 4 is a transverse section taken in the plane indicated by the line  $yy$  in Fig. 3. Fig. 5 is a fragmentary side elevation showing the signal device carried by the gate for giving notice at the crossing of the approach of a train. Fig. 6 is an enlarged detail view showing the means employed for se-

curing the cord to one of the actuating devices located along the track. Fig. 7 is a view somewhat similar to Fig. 3, but showing in side elevation the embodiment of our improvements in a double railway-crossing gate.

Referring primarily to Figs. 1 to 6, 11 represent the track-rails of the line of railway mounted in the usual way on ties 2. The crossing-gate comprises a casing 3 arranged transversely across the road-bed at one side of the crossing to be controlled by said gate, and said casing forms a trough-like chamber adapted to house certain of the operative parts of the device, as will be hereinafter set forth.

At opposite ends of the casing are formed upwardly-extending posts or standards 5, arranged in pairs, one pair at each end of the casing, and between these posts or standards 5, at the upper parts thereof, are pivoted, as seen at 6 in the drawings, the gates 7, each consisting of a wooden bar of suitable length and strength, adapted when in its lowered position, as indicated in dotted lines in Fig. 3, to extend across the road governed by the crossing-gate so as to close the same off and prevent vehicles thereon from crossing the railway-track. When raised to a vertical position, as seen in full lines in Fig. 3, the road is left entirely free and unobstructed.

As indicated in Figs. 1 and 2, the posts or standards 5 and the gates 7 thereon are located at opposite sides of the railway-track, and in order to operate said gates automatically and in unison each gate 7 is provided at its short end with an eye or equivalent device 8, to which is secured the end 9 of a rope, chain or other flexible connection, extending down around a sheave or pulley 10, journaled loosely between the posts 5 of the pair, whence said connection extends around a grooved sheave 11, secured on the end of a shaft 12 journaled in the trough-like chamber 4 beneath the casing 3 and extending transversely of the railway-track, as seen in Fig. 4. The other end 14 of said flexible connection is carried upward and connected to a second eye 15 or equivalent device located on the longer arm of the gate 7, as seen in Fig. 3, whereby it will be seen that when the shaft 12 is turned in one direction the gate 7 will be raised, and



when said shaft is turned in the opposite direction the gate will be lowered, and, as seen in Fig. 4, the sheaves or pulleys 11 of the respective gate-operating devices are fixed on  
5 opposite ends of the same shaft 12, so that both gates 7 will be correspondingly moved when said shaft is rotated.

The shaft 12 is journaled in brackets 16, depending from the roof of the trough-like  
10 chamber 4 wherein said shaft is mounted, and on the central portion of the shaft is fixed a grooved sheave or pulley 17, the periphery of which extends upward through an opening 18 in the casing 3 slightly above the same,  
15 and said sheave or pulley 17 serves to receive the bight 19 of an operating rope, chain or flexible connection, as clearly indicated in the drawings, said connection extending longitudinally of the railway-track about mid-  
20 way between the rails 1, and having one end arranged to wind on the grooved periphery of a sheave or pulley 21, mounted to turn on a vertical shaft or stud 22, projecting up from one of the ties 2 between the rails, the ex-  
25 tremity of the connection being secured to said sheave 21 by means of a bolt or screw 23, as seen in Figs. 1 and 2. The other end 24 of the flexible connection extends along the track in the opposite direction to the end 20  
30 and passes over a guide-sheave 25, mounted on a vertical stud on one of the ties, beyond which guide-sheave it is passed around a small sheave or pulley 26, mounted on a vertical shaft or stud 27, to which sheave 26 said con-  
35 nection is fixed by means of a screw or bolt 28, as shown in the detail view Fig. 6, said screw or bolt passing through the said connection and having its head arranged to clamp the same securely to the sheave.

40 From the sheave 26 the connection extends over a guide-sheave 29 to a sheave or pulley 30, similar to the sheave 26, around which it is also passed, being secured by means of a bolt or screw 31, and from sheave 30 the said  
45 connection extends over a guide-sheave 32 to a sheave or pulley 33 pivoted on a vertical stud 34, to which sheave the extremity of the end 24 of the connection is secured by means of a bolt or screw 35.

50 The sheaves or pulleys 33, 30, 26, and 21 are provided, respectively, with arms 36, 37, 38, and 39, which extend outwardly from their peripheries a sufficient distance to lie closely adjacent to the track-rails in position to be en-  
55 gaged by the wheels of the locomotive and cars as the same approach the crossing, and said arms 36, 37, 38, and 39 form cams adapted to be operated by the train to open and close the crossing-gate.

60 The arms or cams 36, 37, and 38 of the smaller sheaves 33, 30, and 26 connected to the end 24 of the flexible connection are arranged to stand when the gate is open, as seen in Figs. 1 and 3, at angles of sixty degrees  
65 from each other, the arm or cam 36 of the last sheave 33 being then in position to be engaged by the wheel of the locomotive, as seen

in Fig. 1, the arm or cam 37 of the second sheave 30 being arranged sixty degrees in the rear of cam 36, so that said cam 37 will not  
70 come into position to be engaged and operated by the locomotive until the cam 36 has made its movement and caused sheave 33 to make one-third of a rotation, thereby acting  
75 on the sheaves 30 and 26 through the medium of the connection to turn said sheaves one-third of a rotation, so as to bring the cam 37 on sheave 30 into operative position.

As seen in Figs. 1 and 2, a spring 36<sup>a</sup> is arranged to bear against the rear side of cam  
80 36 so as to permit the same to be engaged and moved by a train backing along the road. In this way as the flange of each wheel passes the said cam the spring 36<sup>a</sup> is compressed and  
85 acts after the passage of said wheel to throw back said cam into position to be engaged by the wheel when the train again moves forward, so that the gate may be properly closed. The cam 37 having been thrown into oper-  
90 ative position will be engaged by the locomotive-wheel and also turned so as to cause its pulley 30 to make an additional one-third of a rotation, which by means of the flexible connection is communicated to sheave 20, so  
95 as to cause the same also to turn an additional third of a rotation so as to bring the cam 38 thereon into position to be engaged by the locomotive-wheel, whereby said sheave 26 is turned an additional one-third of a rotation.  
100 By this means it will be seen that a gradual pull is exerted on the end 24 of the connection by the approaching train, so that the gate is slowly closed, thereby giving time for the passage beneath the gate of a train which may  
105 be in the act of crossing the track at the moment the locomotive strikes the first cam 36. The end 20 of the connection being connected to the large pulley or sheave 21 will move the same on its shaft 22 to an extent equal to the  
110 motion imparted to the several cams 36, 37, and 38, whereby the cam 39 of said sheave 21 is moved from its inoperative position (seen in Fig. 1) to its operative position. (Seen in Fig. 2.) The gates being then closed and the  
115 train having passed the crossing the wheels of the locomotive engage the cam 39 of pulley 21 and move the same, together with the cams 36, 37, and 38, back to the position seen in Fig. 1, thereby raising the gate quickly to the position seen in full lines in Fig. 3.

When desired, a number of springs 40 may be inserted in the end 24 of the connection at  
120 points between the sheaves 33, 30 and 26, as seen in Fig. 3, so as to permit a certain degree of slack between the several cams, whereby breakage of the parts will be prevented, and in some cases the horizontally-moving cams and sheaves may be replaced by treadle-levers and sheaves working in vertical planes.

One or both of the gate-bars 7 is provided  
130 with a circular toothed wheel or rack 41 loosely secured and adapted to turn on its pivot 6, and having its teeth 42 arranged to be engaged by a pawl or dog 43 mounted on



the bar 7 and adapted to ride over said teeth when the gate-bar 7 is raised, but to engage said teeth 42 and move said wheel 41 when the gate-bar is lowered to close the gate, and  
 5 the said teeth 42 of wheel 41 are arranged when said wheel is turned to engage the bent end 44 of a lever 45 pivoted on one of the standards 5 and provided with a hammer at its end adapted to strike and sound a bell 46  
 10 also mounted on the standard. In this way, when the gate-bars 7 are lowered by the approach of a train, the pawl 43 engages the teeth 42 of wheel 41 and rotates said wheel, and in the rotation thereof the teeth 42 en-  
 15 gage the end 44 of the lever 45 and vibrate the same, thereby sounding the gong 46, but when said gate-bars are raised to open the gate the pawl 43 rides freely over the teeth of wheel 41 and imparts no movement there-  
 20 to. Therefore the bell or gong 46 is not sounded.

The crossing-gate constructed as above set forth is extremely simple and inexpensive and is not liable to become deranged or in-  
 25 operative while in use. Furthermore, it is entirely automatic in its action and may be arranged so as to be adapted to be operated by the train when the same is at any desired distance from the crossing.

30 When the gate is to be employed on single-track roads or where it is to be operated by trains moving in opposite directions over the same track, the mechanism shown in Figs. 1 and 2 may be duplicated, a set of cams 36, 37,  
 35 38 and 39 being then arranged on each side of each crossing, so as to operate the gate slowly, or the cam 39 may be set so as to permit of being operated by trains passing in both directions along the track, and when de-  
 40 signed for use on double-track railways the chamber 4 and the shaft 12 therein are made to extend across both tracks, and one pair of standards 5 having a pivoted gate is mounted at each end of the casing, as will be readily  
 45 understood.

In order to simplify the devices when the crossing is provided with double gates—as in the case of a very wide crossing, for instance—we prefer to employ the construction shown  
 50 in Fig. 7, wherein the casing 4<sup>a</sup> is made to extend across the space between the gates 7 7<sup>a</sup>, which are usually located at opposite sides of the cross-road and operated by mechanism similar to the mechanism above described  
 55 and shown in Figs. 1 to 6. The shafts 12 and 12<sup>a</sup> of the respective gates 7 and 7<sup>a</sup> are provided with pulleys or sheaves 47 on their ends, over which passes a band or belt 48, crossed, as indicated at 49, so that the move-  
 60 ment of that shaft 12 or 12<sup>a</sup> which is directly actuated from the gate-operating mechanism is communicated to the corresponding shaft of the other gate to simultaneously operate the same.

65 From the above description of our improvements it will be evident that the crossing-gate is susceptible of considerable modification

without material departure from its principles, and for this reason we do not wish to be understood as limiting ourselves to the exact  
 70 construction and arrangement of the several parts herein set forth.

Having thus described our invention, we claim as new and desire to secure by Letters  
 75 Patent—

1. A railway-crossing gate, comprising a gate, a series of cams mounted adjacent to the track and adapted to be engaged and moved successively by a passing train, means  
 80 operated from said cams, for closing the gate, each cam being arranged when moved, to partially close said gate and to throw the succeeding cam into position to be engaged and moved by the train, substantially as set forth.

2. The combination with a railway-track, 85 of a casing extending transversely within the track, a shaft within the casing, a pivotally-mounted gate, a sheave on the shaft, a flexible connection having each end fixed to the gate and passed around the sheave, a second  
 90 sheave within the casing and arranged to turn with the first sheave, a second flexible connection connected with the second sheave, and a trip for said second connection, substantially as described.

3. The combination with a railway-track, of a pivoted gate, a transverse shaft connected with said gate, a sheave on the shaft, a flexible connection passed over the sheave and having its ends extending oppositely there-  
 100 from, a trip connected with one end, a sheave connected with the opposite end, and a trip fixed to said sheave, substantially as described.

4. The combination with a railway-track, 105 of a casing extending transversely and below the same, a pivotally-mounted gate at each end of the casing, a shaft extending through the casing, a sheave at each end of the shaft, flexible connections for each gate having their  
 110 ends fixed to the respective gates, the flexible connections being passed over the respective sheaves, an additional sheave midway of the shaft in the casing, a flexible connection wound around said additional sheave, a trip  
 115 for one end of the connection, a sheave outside of the casing and connected with the remaining end of the connection, and a trip fixed to the said sheave, substantially as described.

5. A railway-crossing gate, comprising a gate, a plurality of cams mounted adjacent to the track and adapted to be engaged and moved successively by a passing train, and means actuated from the cams for operating  
 125 the gate, said cams being each arranged when actuated to move the gate in the same direction, all but one of the cams being normally held out of operative position and each being  
 130 moved into position to be engaged by a passing train by the movement of the preceding cam, substantially as set forth.

6. A railway-crossing gate, comprising a gate, a plurality of cams mounted adjacent



to the track on one side of the gate and adapted to be engaged and moved success-  
ively by a passing train, means actuated from  
the cams for operating the gate, said cams  
5 being each arranged when actuated to move  
the gate in the same direction, all but one of  
the cams being normally held out of opera-  
tive position and each being moved into po-  
sition to be engaged by a passing train by the  
10 movement of the preceding cam, and a cam  
mounted adjacent to the track on the oppo-  
site side of the gate and operatively connected  
with the first-mentioned cams and with the  
gate, said last-named cam being normally held  
15 out of operative position and being moved  
into operative position by the movement of

the first-mentioned cams, and being adapted  
when engaged and moved by a passing train  
to move the gate in the direction opposite to  
that in which it was moved by the first-named 20  
cams, substantially as set forth.

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Witnesses to the signature of Samuel L.  
Reed:

MATHIAS READE,  
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