(No Model.)

2 Sheets—Sheet 1.

F. A. CURTIS.

RAILWAY CROSSING GATE.

No. 551,722. Patented Dec. 17, 1895.

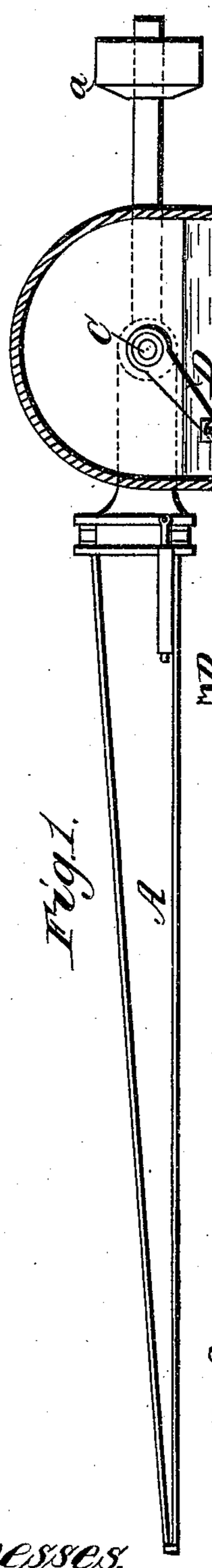

Fig. 1.

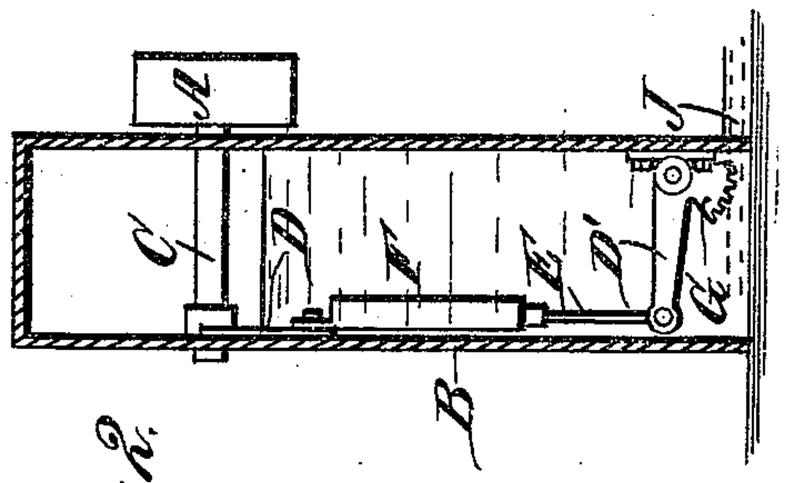

Fig. 2.

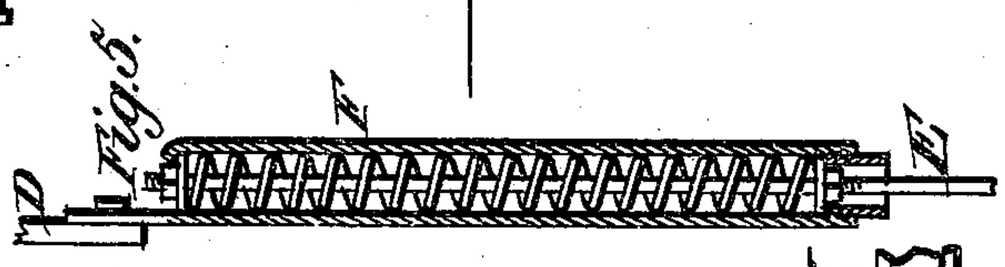

Fig. 5.

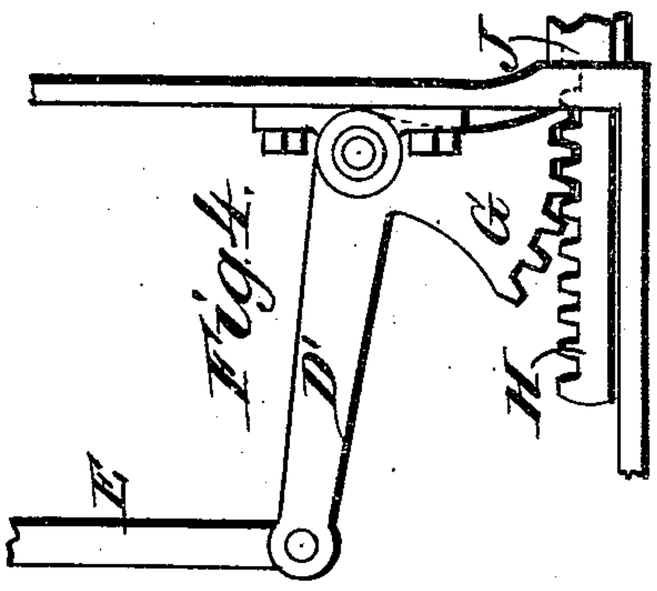

Fig. 4.

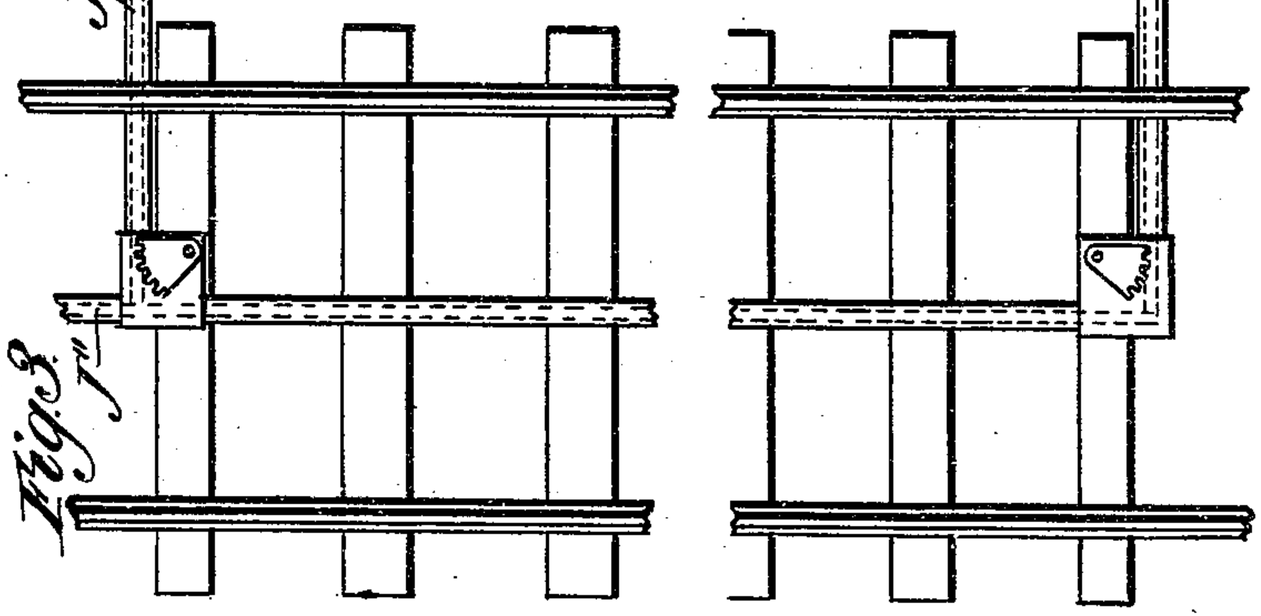

Fig. 3.

Witnesses.
Robert Ewell.
Geo. W. Rea.

Inventor.
Frederic A. Curtis.
By
Edward Taggart
Atty.

(No Model.) 2 Sheets—Sheet 2.

F. A. CURTIS.

RAILWAY CROSSING GATE.

No. 551,722 Patented Dec. 17, 1895.

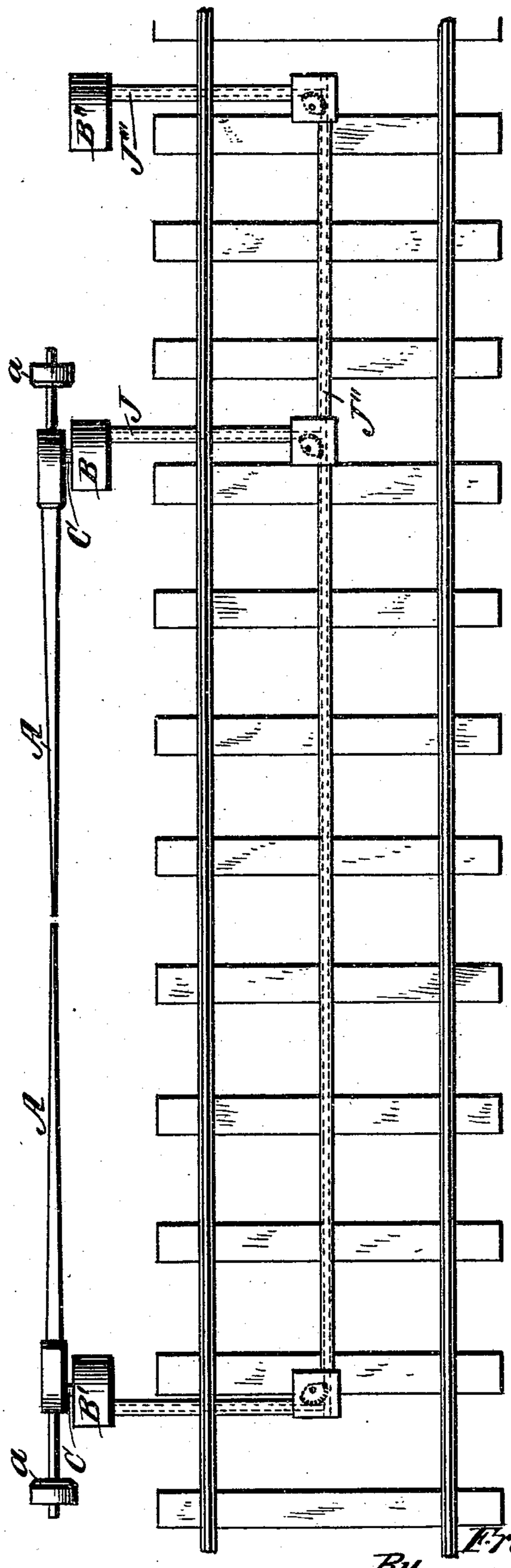

Fig. 6.

Witnesses.
Robert Evatt.
Geo. N. Rea.

Inventor:
Frederic A. Curtis.
By Edward Taggart Atty.

UNITED STATES PATENT OFFICE.

FREDERIC A. CURTIS, OF MUSKEGON, MICHIGAN, ASSIGNOR TO THE CURTIS AUTOMATIC RAILROAD GATE COMPANY, OF SAME PLACE.

RAILWAY-CROSSING GATE.

SPECIFICATION forming part of Letters Patent No. 551,722, dated December 17, 1895.

Application filed October 9, 1893. Serial No. 487,700. (No model.)

To all whom it may concern:

Be it known that I, FREDERIC A. CURTIS, a citizen of the United States, residing at the city of Muskegon, in the county of Muskegon and State of Michigan, have invented certain new and useful Improvements in Railway-Crossing Gates, of which the following is a specification.

My invention relates to improvements in railway-crossing gates; and its objects are, first, to secure an elastic action of the gate-arm in a simple and efficient manner; second, to prevent freezing and the resulting interference with the operation of the gates, caused by water in the winter-time; third, the specific improvements hereinafter particularly pointed out. I have attained these objects by means of the mechanism shown in the accompanying drawings, in which—

Figure 1 is a sectional side elevation of the arm-supporting frame and one of the arms, showing also the spring-case within the arm. Fig. 2 is a cross-section of the same arm-supporting frame on a plane at right angles to that shown in Fig. 1. Fig. 3 shows the method of connection between the two arms, one on each side of the crossing. Fig. 4 is an enlarged view of the lever connection at the base of the arm-supporting frame, showing the method in which the spring is operated by the rod. Fig. 5 is a detailed enlarged view of the spring and its containing-case interposed between the lever connection shown by Fig. 4 and the gate-arm. Fig. 6 is a plan of an entire system in use, showing the relative position of the gate-house, both gate-arms, and the track.

In the drawings similar letters refer to similar parts throughout the different views.

A is the gate-arm. B is the supporting-frame therefor, both constructed, excepting the points hereinafter specified, in the usual manner. The weight of the gate A may be counterbalanced, as usual, by a weight *a*, as shown in Fig. 1. This arm is hung upon a pivot, supported and turning in the sides of the frame, the same being shown by C in Fig. 2. To this pivot or shaft within the case or frame B is attached a short arm or crank D, the purpose of which is to turn or rock the shaft. This short arm D is connected through its lower end with the lever-arm D′, situated at or near the bottom of the casing-frame, the connection being substantially by a rod E, pivoted at its lower end to the lever-arm D′ and pivotally connected at the upper end to the rocking-arm D. Instead of making this lever connection directly, however, I interpose a spring in the form shown in Fig. 5.

The spring is contained in a suitable case, preferably cylindrical, the case being shown by F in Fig. 5, and this is pivoted at its upper end to the rocking-arm D, as shown by means of a suitable ear or extension situated thereon. The rod E passes up through this case, having at its upper end a washer and nut and having a similar washer and nut situated upon said rod at the lower end of the spring-containing case. Between these two washers is the spiral spring, and it is by the washers held within the case. The adjustable nuts at each end of the spring permit the tension thereof to be properly regulated.

At the bottom of the frame the lever-arm D′ is connected to a toothed segment, which in connection with the lever-arm D′ constitutes a bell-arm, and is hung to the supporting-frame in a suitable manner.

The segment marked G in Fig. 2 is operated by a corresponding toothed rack, this construction being shown more in detail in Fig. 4, where the rack is marked H. This rack is upon the upper surface of the rod J, which extends along the ground and under the rail to a point within the track where it is connected by means of a similar toothed segment to a similar rack, the rod running lengthwise of the track and the motion thereby changed. This latter rod is connected by a similar toothed segment to a rod running at right angles to the track and to the other gate-frame on the other side of the crossing. This construction is shown in Fig. 3, where the second gate-frame is marked B′, and the three rods above referred to are marked J, J′ and J″. Within the second gate-frame B is a similar construction to that shown in the first frame, and the second gate-arm is operated in the same manner. The rod J″, Fig. 3, is also constructed to extend along the track beyond the point where it is connected with the rod J′ to

the point, as shown in Fig. 6, where it is similarly connected to the similar rod J'''. This latter rod extends out of the track to the supporting-frame B'', where it is suitably connected with and operated by a lever or other mechanical power in the usual manner.

The operation of the device is as follows: By moving the operating-lever situated in the supporting-frame B'', the rod J''' may be moved, say, toward the track. This will cause the rods J and J' to move away from the track and thereby operate the toothed segments at the bottoms of the supporting-frames. This in turn will raise the rods E and thereby raise the gate-arms. Instead, however, of a rigid action, such that the gate-arms will start and stop with a jar, the interposed spring insures an elastic action which prevents jar or breaking.

In the construction of my device I connect the two supporting frames or cases for the gate-arms, and also the smaller containing-frame for the operating-lever at the gate-house by a system of piping and boxes, surrounding, respectively, the connecting-rods and the mechanism at the angles for changing the direction of the motion, the system of such piping and boxing being shown together in Fig. 6. The pipes are attached to the boxes and to the frames B B', &c., by suitable water-tight connections, and water is thereby prevented from entering any part of the construction, while the entire device from the gate-house to the further supporting-frame forms one complete and connecting water-tight box. In operation I then fill this entire system of pipes and boxes with a suitable material, preferably crude oil, which will not freeze. The height of the supporting-frame for the gate-arms being, as usually constructed, about three feet, this provides sufficient margin to equalize any difference in the height of the ground at the different points or places where the cases are located. The entire system being thus flooded with oil, all the parts are lubricated, rusting is prevented, the entire absence of water is insured, and as the oil cannot freeze, any interference with the successful operation of the gates in cold weather, caused by freezing, is avoided.

I find it desirable, in operation, to construct the toothed segments situated in the railroad track with an offset, thereby permitting the rods and containing-pipes at right angles to the rail to pass under the rail, and the rod and containing-pipe to lie lengthwise of the track upon the ties. The entire system is thus open and subject to easy repair at any time.

Evidently this construction and system can be used in connection with an automatic lever, operated by the approaching train, as well as with the hand-levers.

Having thus described my invention, what I claim to have invented, and desire to secure by Letters Patent, is—

1. The combination of the gate, a water tight system of casings extending up and surrounding the operating mechanism of the gate, and connecting the gate with the operating lever, the operating mechanism within such system for causing the gate to be operated by the lever, and a non freezing liquid permanently filling the interior of the said system, substantially as described.

2. In a railway crossing gate, the combination with a gate-arm having a pivot C, of an arm or crank D secured to the pivot, a rod E, a spring case F connected with the arm or crank, and a spring arranged within the case and acting thereupon and upon the said rod to relieve the shocks in both the opening and closing movements of the gate, substantially as described.

3. In a railway crossing gate, the combination with a gate-arm having a pivot C, of an arm or crank D secured to the pivot, a rod J having a rack H, a lever D' having a toothed segment G engaging the rack, and a spring-containing case interposed between the arm or crank and the lever, and connecting these parts to relieve the shocks in both the opening and closing movements of the gate, substantially as described.

In witness whereof I have hereunto set my hand and seal in the presence of two witnesses.

FREDERIC A. CURTIS. [L. S.]

Witnesses:
P. J. CONNELL,
ARTHUR C. DENISON.