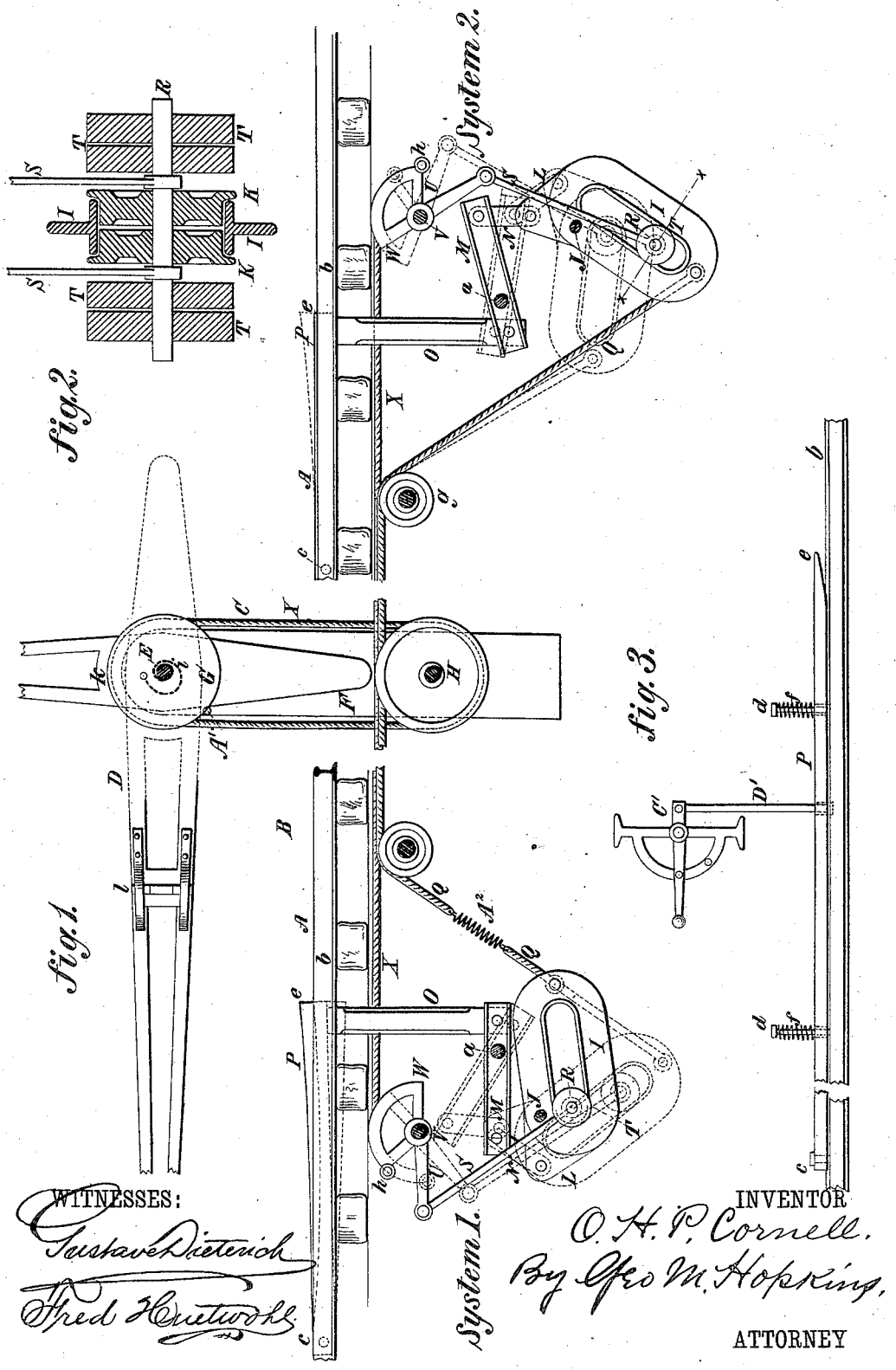
(No Model.)

O. H. P. CORNELL.

RAILROAD GATE.

No. 306,222. Patented Oct. 7, 1884.



WITNESSES:

Gustave Dieterich

Fred Hueteworth

INVENTOR

O. H. P. Cornell.

By Geo M. Hopkins,

ATTORNEY

UNITED STATES PATENT OFFICE.

OLIVER H. P. CORNELL, OF ALBANY, NEW YORK.

RAILROAD-GATE.

SPECIFICATION forming part of Letters Patent No. 306,222, dated October 7, 1884.

Application filed October 25, 1883. (No model.)

To all whom it may concern:

Be it known that I, OLIVER H. P. CORNELL, a citizen of the United States, residing at Albany, in the county of Albany and State of New York, have invented a new and useful Improvement in Railroad-Gates and Mechanism for Operating the Same; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to the class of railroad-gates operated by the locomotive or cars; and it consists of apparatus for releasing and replacing gate-operating weights by the engagement of the locomotive or car wheels with a track-lever connected with the weight sustaining and releasing mechanism, as hereinafter described. The common difficulty with railroad-gates operated by the cars or locomotive is that the high speed imparted to the gate and gate-operating mechanism tends to quickly injure and destroy them and render the gate unreliable or useless. To avoid these difficulties, I employ weights to operate the gate, and I provide mechanism for replacing the weights by power transmitted from the passing locomotive or cars.

Figure 1 is a side elevation of my improved gate-operating system with parts broken out to bring the apparatus within the compass of the drawings. Fig. 2 is a transverse section of the weight and weight-frame taken on line *x x* in Fig. 1. Fig. 3 is a plan view of apparatus for holding the track-lever out of the path of the locomotive and car wheels.

Like parts are designated by the same letters of reference in the different figures of the drawings.

At one or both sides of the railroad-track A, and at the side of the highway B to be closed, is placed a gate, C, consisting of a counterbalanced arm, D, placed loosely on the shaft E, journaled in the post F. The arm D is capable of being placed in either a vertical or horizontal position, and has sufficient length to reach wholly or partly across the highway.

To the shaft E is fixed a sheave, G, and in the post F, under the sheave G, and below the surface of the ground, is journaled a sheave, H, having two peripheral grooves.

On opposite sides of the gate, and at a suitable distance therefrom, are placed similar but oppositely-arranged systems of mechanism, which, for the sake of clearness, I shall designate as "system 1" and "system 2," and as the corresponding parts of the two systems are alike I shall refer to them by the same letters of reference.

Below the railroad-bed is placed an oblong frame, I, on a fixed pivot, J, on which it is capable of making a quarter of a revolution in a vertical plane parallel with the railroad-track. The sides of the frame I are T-shaped in cross-section, with the double flange of the T innermost, forming a bearing-surface for the flanged wheels K to roll on. The pivot J is on the upper side of the frame I near one end. An arm, L, projects from the pivot end of the frame I, and is connected with the longer arm of a lever, M, by a link, N. The lever M has a fixed fulcrum, *a*, and its shorter arm is pivoted to a vertical bar, O, extending upward at the side of the rail *b* of the track A. A curved track-lever, P, is pivoted to the rail *b* at *c*, with its free end resting on or jointed to the upper end of the bar O. The pivoted end of the track-lever P is on a level with the top of the rail *b*, but the free end *e* in its normal position is a short distance higher. The top surface of the track-lever P forms a vertical curve, which may be either regular or compound, and its upper surface at the pivot-point is tangent to the horizontal plane of the top of the rail. The car-wheel runs along the curved upper surface of the lever P and depresses the said lever gradually without giving a sudden shock to the lever or mechanism connected therewith. The track-lever P is slotted to receive two bolts, *d*, which pass through the slots into the rails, and support two spiral springs, *f*, which press the track-lever P against the rail *b*. The free end *e* of the track-lever P is beveled, so that a car-wheel striking against the beveled end of the track-lever will push it away from the rail and pass it without depressing it. The track-levers of systems 1 and 2 both lie in the same direction for reasons that will be made clear when the operation of the apparatus is described. The free ends of the frames I are connected by a wire rope, Q, which runs over

sheaves *g*, and is of such length as to hold one frame in a raised position, while the other is down, and vice versa. The flanged wheels K K turn on a shaft, R, extending through eyes formed in the ends of the yoke S, and through disk-weights T, which may be readily applied or removed, if desired, to increase or diminish the speed of closing or opening the gates. The yoke S straddles the frame I and parts attached thereto, and is jointed to a lever-arm, U, secured to a shaft, V. A sector-lever, W, in system 1 has a grooved periphery for receiving the wire rope X, which is secured to the said sector-lever at *h*, and extends to and around the doubly-grooved sheave H, thence upward around the sheave G on the shaft E, thence downward and around the sheave H in its second groove, thence to the sector-lever W of system 2.

Upon the shaft E is placed the counterbalanced bar D forming the gate. A spring, *i*, attached by its inner end to the shaft E, is connected with the bar D at its outer end, and pushes the said bar forward against a pin, *j*, projecting from the sheave G, so that whenever the sheave G is made to turn the gate will turn also, except there should be some obstruction beneath the gate at the moment of closing, when the spring *i* will yield, allowing the sheave G to move forward without carrying the bar D. The wire rope X is fastened at the point *k* on the sheave G to insure a positive motion of the said sheave. The post F is provided with a stop, A′, for preventing the gate from falling below a horizontal position or rising past a vertical position.

The gate-bar D, beside being capable of yielding vertically, is made in two parts and hinged together by a rule-joint, *l*, and the two parts are held in line normally by the springs *m m*, fastened to one part of the bar D and pressing on the other part. The rule-joint is arranged relative to the track, so that it may open outward or away from the track, allowing a team or animal to escape should the gates shut while the animal or team is on the track. The track-lever P has considerable length, and a curved inclination or grade which is slight near the pivotal point and increases toward the free end. This construction insures a gradual and easy starting of the gate-operating mechanism, and prevents anything like blows or severe shocks to the mechanism. A switch-lever, C′, placed near the track, is connected with the track-lever by the rod D′, which passes loosely through a hole in the track-lever P, and has a head, *p*, at the inner side of the track-lever. By turning the switch-lever C′ the track-lever P may be drawn away from the track, so that the locomotive and car wheels will not engage the track-lever; but when the switch-lever C′ is in its normal position the operation of the track-lever is in no manner interfered with, as the said track-lever is free to move vertically or laterally.

To prevent any disarrangement of the gate-operating mechanism in case a very long train should cover both systems, or in case there should be a train on each system, as might be the case in a car-yard, I place a spiral spring, Q′, in the cable Q, so that when both track-levers are depressed the spring will yield, allowing the parts to move without straining the cables or endangering the mechanism. The spring Q′ has sufficient strength to prevent it from yielding during the normal working of the gate-operating mechanism.

It is obvious that the spring Q′ may be placed between either of the track-levers P and the vertical bars O, or in any suitable part of either system; therefore I do not confine myself to any particular position for the said spring Q′.

The operation of the mechanism is as follows: A locomotive or car wheel running upon the curved track-lever P of system 1 depresses the said lever, slowly at first and more rapidly thereafter, bringing more or less pressure to bear upon the vertical bar O, pushing down the shorter arm of the lever M, raising the longer arm thereof, and through the connection of the said lever M with the arm L raises the said arm, moving the free end of the frame I downward into a nearly vertical position. This operation releases the weights T, which before were retained at the end of the slot in the frame I near the pivot J. Simultaneously with the depression of the frame I of system 1 the free end of frame I of system 2 is raised by virtue of its connection with frame I of system 1 by the wire rope Q. This raises the weights T of system 2 at the same moment the weights T of system 1 are released, so that they are free to fall of their own gravity, while the weights T of system 2 are replaced at the end of the slot in the frame I, all as shown in dotted lines. The falling of the weights T pulls down the lever U, turning the sector-lever W, and drawing the wire rope X forward toward system 1. This movement of the rope X turns the sheaves H and G and moves the gate-arm D from a vertical to a horizontal position, as shown in dotted lines, and also draws the weights T of system 2 to the end of the slot near the pivot J in frame I. The locomotive, after passing the highway B, runs upon the track-lever P of system 2, which has been elevated by the movement of the frame I. The said track-lever P is now depressed, and through the medium of the bar O, lever M, and link N throws the frame I downward into the position shown in full lines in the drawings, at the same time raising frame I of system 1 by means of the rope Q. The weights T of system 2 now fall, drawing down the lever U, turning the sector-lever W, and drawing the wire rope X toward system 2, turning the sheaves H G, returning the gate-bar D to the vertical position, and at the same time replacing the weights T of system 1 at the end of

the slot in frame I near the pivot J. The raising of the frame I of system 1 replaces the track-lever P in its inclined position, ready to be acted upon by the next passing locomotive or car.

I do not limit or confine myself to the exact construction and combination of parts herein shown and described, as these may be varied without departing from my invention. In some instances I may place the entire mechanism above the level of the ground instead of beneath the ground. In such case the connections and levers would necessarily require some modification to meet the exigencies of the case. Again, I may in some instances connect the track-lever P by means of a bar directly with the frame I, dispensing with the lever M and link N.

Instead of the curved track-lever P, I may employ a straight track-lever by placing the upper surface of its pivoted end below the level of the rail, so that the car-wheel will not touch the lever until after it has passed the pivot. With this arrangement, the car-wheel, after contact with the straight track-lever, will continue to depress it until it passes off at the free end.

The springs *f* may be supported by brackets attached to the rail and extending around the track-lever. In this case the track-lever would be imperforate.

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

1. The combination, with a railroad-gate, of two gate-operating weights and two pivoted and oppositely-arranged weight-sustaining and weight-releasing frames, as described, the said frames being connected with pivoted track-levers, and capable of being moved by a passing train, so that a train approaching the gate will cause one of the weights to be supported by its frame and the other released to close the gate, and the train on receding from the gate will reverse the movement of the weight-sustaining and weight-releasing frames and of the weights and cause the gate to open, substantially in the manner specified.

2. In mechanism for operating railroad-gates, the combination, with a track-lever arranged to be operated by locomotive or car wheels, of a pivoted weight-sustaining and weight-releasing frame I, as specified.

3. The track-levers P, frames I, weights T, and connective devices, in combination with the gate-bar D, as described.

4. In mechanism for operating railroad-gates, two systems of oppositely-arranged operating mechanism, each consisting of a track-lever, P, bar O, lever M, frame I, and weights T, the two systems being connected with each other and with the gate by means of wire ropes or other connective medium.

5. In mechanism for operating railroad-gates, the frame I, wheels K, and weights T, in combination.

6. The combination of the frame I, bar O, and intermediate connections, the track-lever P, and switch-lever C′, as specified.

7. The spring-pressed track-lever P, having the beveled end *e*, in combination with the frame I and intermediate connections, as described.

8. The combination of the spring-acted rule-joint *l* with the gate-bar D, as specified, whereby the free end of the said bar is permitted to move laterally, for the purpose named.

9. In gate-operating mechanism, the combination of the frame I, track-lever P, and intermediate parts, the wheels K, shaft R, weights T, yoke S, and wire-rope connections.

10. The combination, with the gate-bar D and weights T, of the lever-arm U, section-arm W, wire rope X, and sheaves H G.

11. The combination, with systems 1 and 2 of the gate-operating mechanism, of a spring interposed between the two systems, as herein described.

OLIVER H. P. CORNELL.

Witnesses:
CHAS. L. COHN,
GEO. M. HOPKINS.