

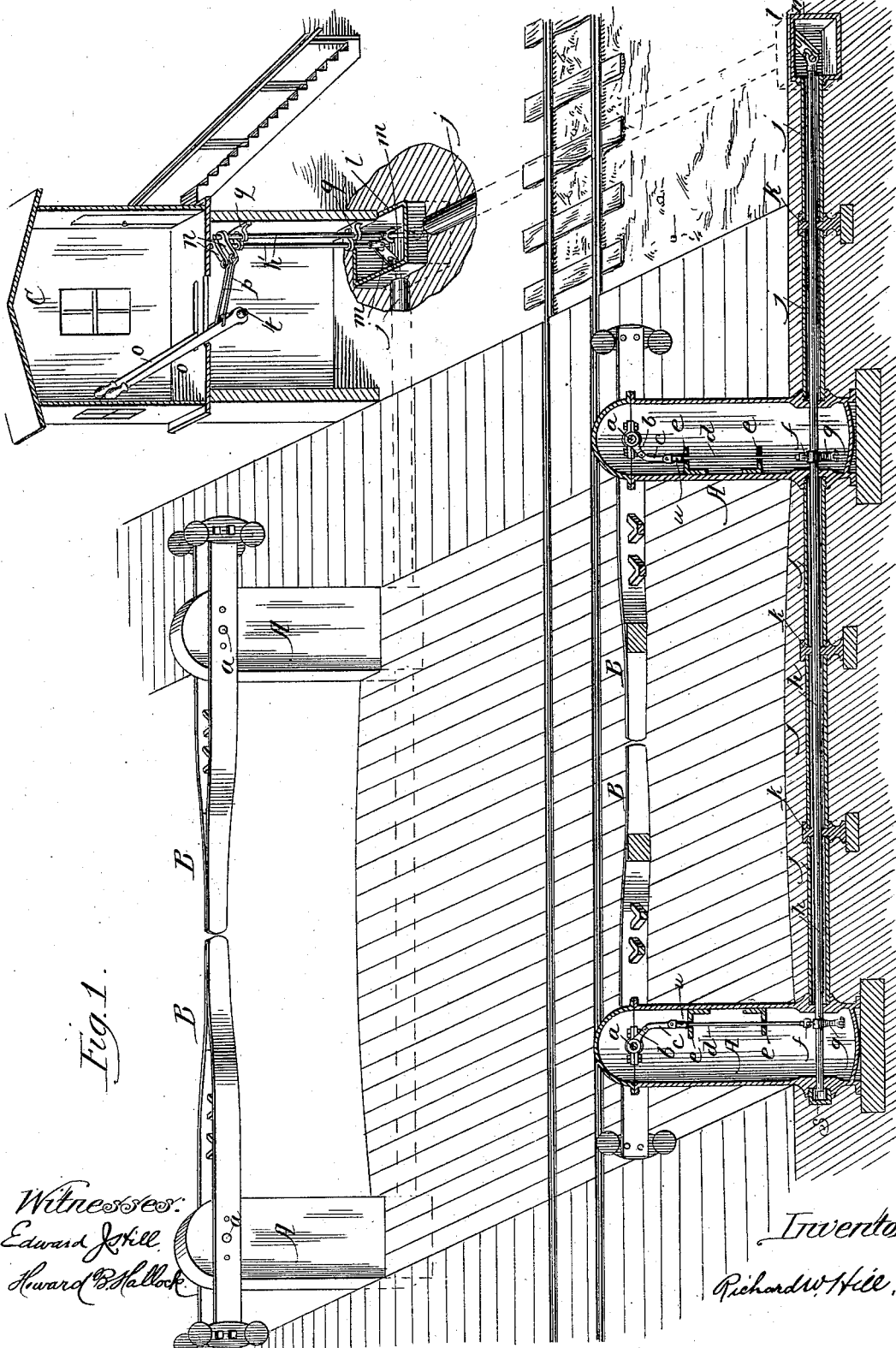
(No Model.)

2 Sheets—Sheet 1.

R. W. HILL.  
GATE FOR RAILWAY CROSSINGS.

No. 384,160.

Patented June 5, 1888.



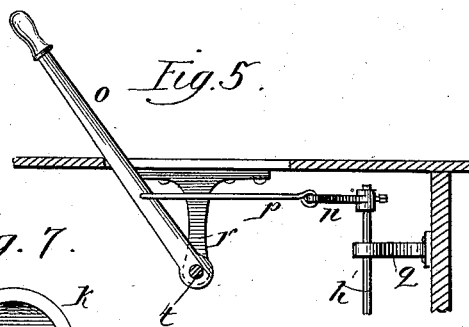
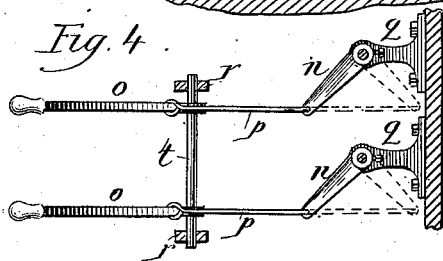
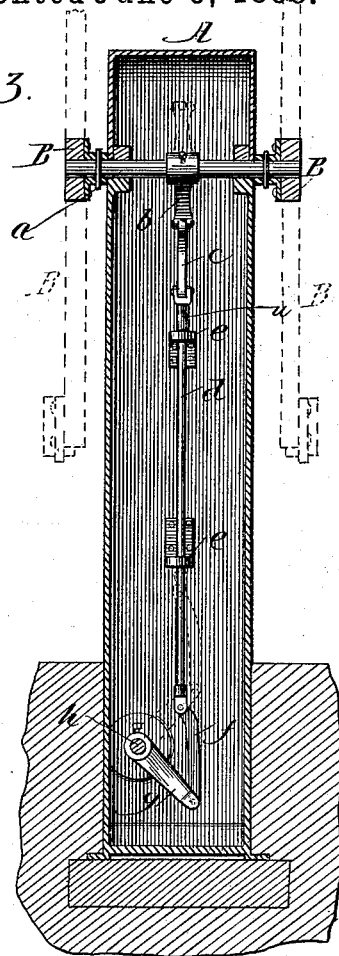
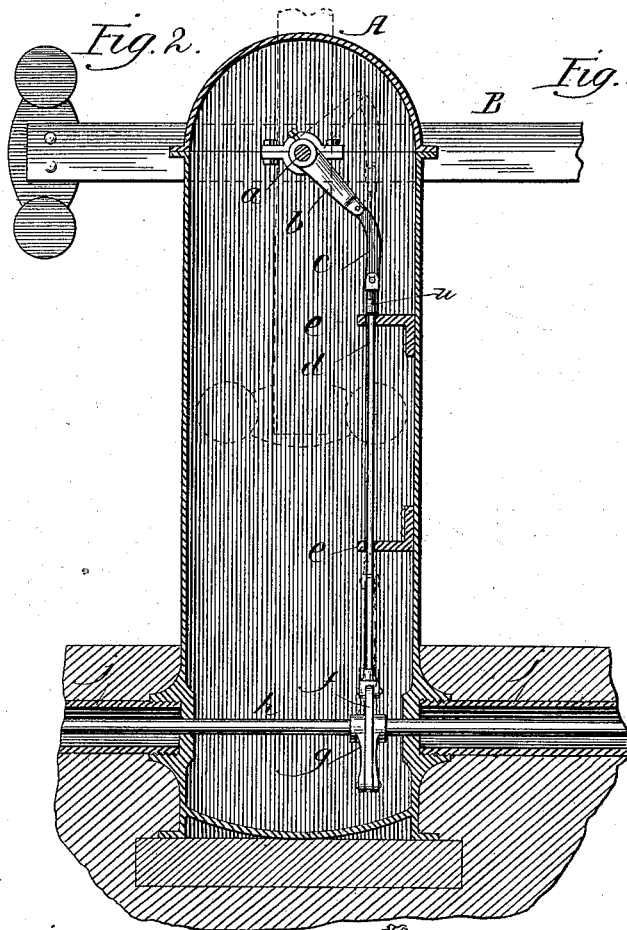
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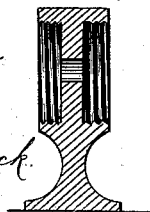
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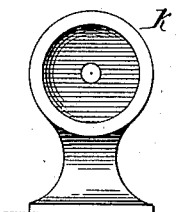
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*Fig. 6.*



*Fig. 7.*



Witnesses:  
Edward J. Hill,  
Howard B. Hallock.

Inventor:  
Richard W. Hill.

# UNITED STATES PATENT OFFICE.

RICHARD WILLIAM HILL, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE  
AMERICAN LEAD AND ZINC WORKS.

## GATE FOR RAILWAY-CROSSINGS.

SPECIFICATION forming part of Letters Patent No. 384,160, dated June 5, 1888.

Application filed January 28, 1888. Serial No. 262,200. (No model.)

*To all whom it may concern:*

Be it known that I, RICHARD WILLIAM HILL, a citizen of the United States, of the city of Chicago, in the county of Cook and State of Illinois, have invented a new and Improved Gate for Railway-Crossings; and I do hereby declare the following to be a full, clear, and exact description thereof, which will enable others skilled in the art to which my invention relates to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to improvements in the construction of gates for railway-crossings.

In the drawings, Figure 1 represents a longitudinal central section of a gate composed of twin arms placed on opposite posts, showing its construction and mode of operation according to my invention, as hereinafter described and set forth. Fig. 2 is the representation of one of these posts, substantially as they appear in Fig. 1. Fig. 3 is a transverse section of the same post, showing the pitman, the crank-arms, and the connecting-rods. Fig. 4 is a view of the levers and their connections. Fig. 5 is a side view of one of the same levers and its connections. Fig. 6 is a sectional view of a hanger or support for the casing, in which the vertical shaft is inclosed. Fig. 7 is a side view of said hanger or support.

Similar letters of reference indicate corresponding parts.

A is a hollow post, set substantially and firmly in the ground. B is the balanced arm or swinging bar. C is the keeper's house. *a* is a rock-shaft upon which this arm B swings. *b* is a crank-arm rigidly attached to the rock-shaft *a*. *c* is a connecting-rod. *d* is a pitman. *e e* are the guides for this pitman. *f* is a connecting-rod. *g* is a crank-arm placed upon the tumbling-rod. *h* is the tumbling-rod or counter-shaft. *h'* is a secondary rock-shaft or vertical shaft. *j* is the tube or pipe incasing the tumbling-rod. *k* is the support or hanger, also shown in Figs. 6 and 7. *l l* represent the boxes with bearings for the universal joints to run in. *m m* are double universal joints. *n n* are cranks upon the vertical shaft in the keeper's house. *o o* are levers for moving these cranks. *p p* are connecting-rods. *q q* are

hangers. *r r* are also hangers. *s* is a cap to cover the end of the tumbling-rod. *t* is a spindle or shaft upon which the levers *o o* turn.

Care should be taken to have the rods of sufficient strength to avoid torsion and deflection. It will be observed that when properly constructed a balanced gate stands, if open with the swinging bar B, perpendicular; if closed with the said bar, horizontal. Hence to close the gate the said bar is required to pass through a quadrant, while to open the gate the said bar must return through the same quadrant. Therefore the rock-shaft upon which the swinging arm B moves rotates either way but ninety degrees upon its bearings, and this is all the motion required to open and close the gate. I produce this movement by means of the rotation of a counter-shaft, which I call a "tumbling-rod," placed upon bearings below the rock-shaft *a* through a little more than one-fourth of a circle either way, so connecting the said rock-shaft *a* with the tumbling-rod that this motion may be transmitted from the tumbling-rod to the rock shaft. I place a crank-arm, *b*, upon the rock-shaft *a*. When the swinging arm B is perpendicular, this crank should be at an angle of forty-five degrees. I also place a corresponding crank-arm, *g*, upon the tumbling-rod, *h*, which should be vertical when the swinging bar is perpendicular. I lead or extend this tumbling-rod by means of gearing or universal joints to any desired point at which the keeper may be stationed.

In case the counter-shaft or tumbling-rod is placed parallel to the rock-shaft *a*, then the crank-arms *b g* will be in the same plane, and may be connected together by a firm rod; but as it is usually desirable to have the counter-shaft or tumbling-rod at right angles with the rock-shaft *a*, I provide guides, a pitman, and two connecting rods, with joints, as shown, between the crank-arms *b g*, for without such joints (the crank-arms being at approximately right angles to each other) universal joints would be required. By the use of these guides, pitman, and connecting rods I am enabled to dispense with gearing and to communicate the motion from the tumbling-rod to the rock-shaft *a*, so that the tumbling-rod and rock-shaft may be at any desired angle with refer-

ence to each other. At the extremity of the vertical shaft I place another rigid crank-arm, *n*, similar to the crank-arms *b g*, connecting the same by link with a lever in the hands of the operator, so that by moving this lever *o* backward and forward I secure the requisite rotation of the tumbling-rod back and forth through a little more than a quarter of a circle, due allowance being made for lost motion, owing to imperfect construction and the wear of the parts.

Two bars or arms upon opposite posts, required to swing toward each other, are generally used for the wider ways or crossings. The wind has a tendency to obstruct the operation of these arms, blowing one down and holding the other up; hence it has been found requisite to connect these opposite swinging bars together, so as to cause the rise or descent of the one to raise or lower the other. I accomplish this by means of this tumbling-rod and its connections with the rock-shafts *a a*, so that the opposite swinging bars are rigidly held together. They therefore must move together through similar arcs and come to rest at like though reverse angles at any point between the perpendicular and horizontal, and vice versa. Thus connected these arms may be actuated by rotating the tumbling-rods by means of air-pressure cylinders, chains, cords, or gearing, as well as by the connections, as herein described. I place stops upon the guide rod, so that the arm *B* shall be held firmly at a perpendicular or at a horizontal position by the lugs which form the guides *e e* in each post. These stops *u* should be protected by springs, so as to relieve the structure from the shocks produced by opening and closing the gate. The tumbling-rod, as well as its bearings, joints, and connections, I protect from the accumulation of surface water and the frost, snow, or ice by means of an external box or tubing with water-tight joints and covered

boxes, substantially as shown in the drawings, so that the proper working of the rod and its joints may not be obstructed by frost in cold weather.

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

1. The combination of a pivotally-mounted balanced gate-bar and a suitably-mounted rock-shaft actuating said bar by crank-and-pitman connection therewith, said rock-shaft being provided with universal joints and actuated by a swinging lever connected with the extremity thereof.

2. In a gate for railway-crossings, the combination of two independent pairs of pivoted arms, two rock-shafts, each actuating a pair of said arms by suitable connections, vertical rock-shafts joined to the first, respectively, by universal couplings, and two adjacent pivoted hand-levers actuating said vertical rock-shafts, whereby a single operator may at will operate either pair of said arms independently or both pairs simultaneously.

3. In a gate for railway-crossings, the combination of a pair of suitably-pivoted bars, a horizontal rock-shaft actuating said bars by suitable connections, a vertical shaft having at its upper extremity a rigid crank-arm, a pivoted lever connected by a link to said crank-arm, and a bar connected with the lower end of said vertical shaft and said horizontal rock-shaft by universal couplings, substantially as set forth.

4. The combination of the guides, pitman, connecting-rods and crank-arms, the tumbling-rod, and the axle of a balanced gate, substantially as and for the purpose set forth.

RICHARD WILLIAM HILL.

Witnesses:

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EDWARD J. HILL.