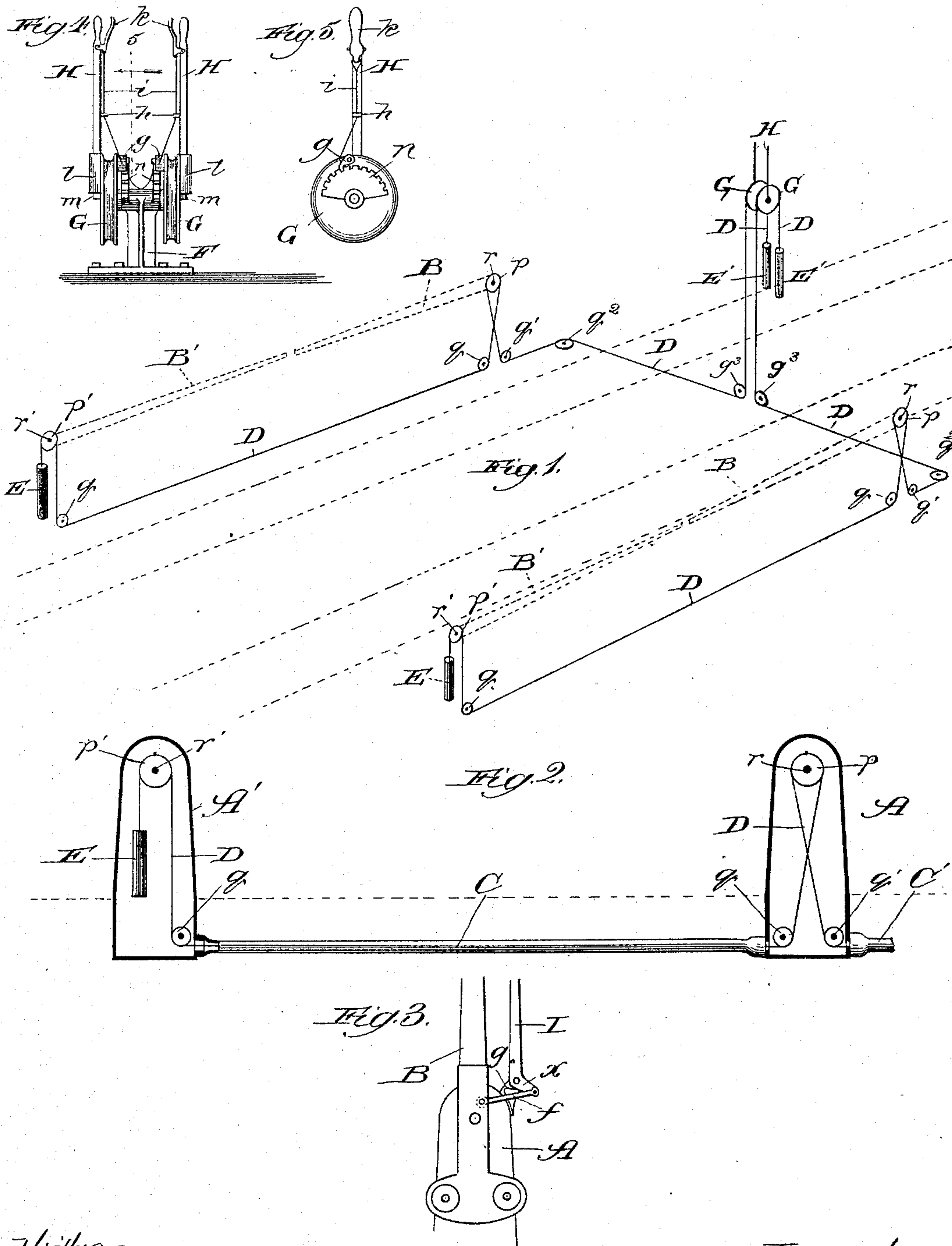


(No Model.)

F. W. MILLS.  
RAILROAD CROSSING GATE.

No. 522,798.

Patented July 10, 1894.



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# UNITED STATES PATENT OFFICE.

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## RAILROAD-CROSSING GATE.

SPECIFICATION forming part of Letters Patent No. 522,798, dated July 10, 1894.

Application filed July 1, 1889. Serial No. 316,196. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK W. MILLS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Railroad-Crossing Gates, of which the following is a specification.

My invention relates to an improvement in the class of gates in use at railroad crossings, in which each gate comprises a pair of posts located at a side of the crossing and at opposite sides of the street, and a pair of gate-arms, pivotally supported on the posts, whereby they are adapted to be raised to or toward vertical positions to remove the barrier they form when down, and to be lowered toward each other across the street to afford the barrier; and my invention, or that part thereof which bears upon mechanism for actuating the gate-arms, relates particularly to the class employing a mechanical tie for the bars, in contradistinction to the air-tie used for some gates of the aforesaid class.

The objects of my improvement are to provide a tie comprising a continuous cable, chain, rope or wire so connected with the gate-arms that if one or the other of the latter be raised or lowered the other will be simultaneously and similarly moved, and which cable, or other connecting medium, shall comprise a single length or strand and be controlled by a weight or spring at each of its opposite ends, whereby to produce movement of the arms for either of the two purposes it shall only be necessary to lift one or the other of the weights, thus to remove the effect of its gravity from the gate-arms, and whereby the weights may, more or less, approximately counterbalance each other, so that to move the counterbalanced arms for either purpose shall but require the inertia and friction of parts to be overcome.

My invention consists in the general construction of my improvement; and it also consists in details of construction and combinations of parts, as hereinafter described and claimed.

In the accompanying drawings—Figure 1, is a perspective diagram showing gates involving my improvement on opposite sides of a railroad crossing; Fig. 2, a broken view

showing posts in sectional elevation and my improved tie for the gate-arms; Fig. 3, a broken view showing a connection between a street-arm and sidewalk-arm; Fig. 4, a view in elevation of a lever and pawl and ratchet mechanism for controlling the gate-arms; and Fig. 5, a section taken on the line 5 of Fig. 4 and viewed in the direction of the arrow.

Each of the two gates illustrated in Fig. 1 involves precisely the same construction; the posts, shown in Fig. 2, being omitted from the first figure for the sake of clearness in the illustration.

A and A' are the posts, which I prefer to form of metal, and hollow; and B and B' are the gate-arms, of usual or any suitable construction, pivotally supported on shafts, *r* and *r'*, on the respective posts, the shafts being journaled in their bearings to move with the gate-arms. Underneath the ground (or, if preferred, above ground) is a pipe, C, or any suitable conduit, extending between the posts, with which it communicates at opposite ends; and adjacent to each end of the pipe is located a pulley or analogous guide, *q*.

D is a cable, having a weight, E, attached at one end, and passing over a pulley, *p'*, fast on the shaft *r'* of the post A, thence on a guide, *q*, through the pipe C, and on the other guide *q* backward around a pulley, *p*, fast on the shaft *r* and down, crossing itself below the pulley *p*, under a guide *q'*, through a pipe C', extending from the post A to the point of operation—ordinarily a cabin adjacent to the railroad-track.

At the operating station I provide means for actuating each gate of a crossing and comprising a post, F, fastened to the floor and having stationary segmental ratchets, *n*, extending vertically from opposite sides of its upper end. A stationary horizontal shaft, *m*, projects, at opposite ends, beyond the sides of the post from which the ratchets *n* project, and carries loosely on each end a pulley, G. Each pulley G has secured eccentrically to its outer side a box, *l*, to receive one end of a lever, H, having a handle, *k*, pivoted to its inner side and connected with a rod, *i*, passed through a staple, *h*, on the inner side of the lever, and extending thence against and secured to a dog, *g*, pivoted eccentrically to the



inner side of the pulley G and engaging with the ratchet *n* adjacent to it.

The cable D passes through the pipe C' over a horizontal guide-pulley,  $q^2$ , in the pipe, and  
5 over a vertically-supported guide-pulley,  $q^3$ , below the station, vertically upward over a pulley G, and is provided with a weight, E', at its extremity. The cable, chain, or the like, D, is clamped or otherwise fastened to  
10 each of the pulleys,  $r'$ ,  $r$ , and G, over which it passes.

From the foregoing description of the parts, it will be seen that the arms B and B', which should, as ordinarily, be counterbalanced on  
15 their supports, will remain at any position to which they are turned in the arcs of their movements owing to the counterbalancing of the cable D, by the weights E and E'; and that to raise the arms from their lowered po-  
20 sitions, the lever H, on releasing the dog *g*, by gripping the handle *k*, is turned and with it the pulley G in a direction to lift the weight E', thereby allowing the gravity of the weight E to effect the rise of the gate-arms, while to  
25 lower the latter requires merely turning of the lever in the opposite direction, in each case the requirement being merely to overcome the friction of parts and the inertia of the gate-arms to produce their movement.

30 The pawl and ratchet device on the actuating mechanism is desirable if for no other purpose than to prevent movement of the gate-arms by force brought accidentally to bear against the lever, H. Instead of weights,  
35 of course springs may be used.

It is also quite obvious, though not so desirable, that the arrangement may be such as to cause the weight E to have a tendency to lower, instead of raise the arms, when of course  
40 the counterbalancing effect of the weight E' would be exerted in the direction opposite that for which it is shown to be arranged.

I wish to be understood as including all such modifications as within my invention, the  
45 broadest sense of which I believe to be a single (in contradistinction to endless or double) cable, or analogous medium, so tying the swinging arms at the pulleys, or equivalent

form of levers, on their shafts, that strain exerted on one end of the cable, or the like, will  
50 move both arms simultaneously in opposite directions, and having a weight, or equivalent medium at each end of the cable exerting strain which will operate, if the gravity of the other weight be overcome, as by lifting it,  
55 to effect, of its own accord, either of the opening or closing movements of the gate-arms.

The especial advantage of my improved arrangement consists in the simplicity of construction it affords; in the saving of the extra  
60 length of cable, which would be required were the connecting medium endless or double, and of the appurtenances which a double length would render necessary; and in the readiness with which a new cable can be adjusted when  
65 required.

Where side-walk arms, I, are provided, I bend the ends of each, as shown at *x*, Fig. 3, to constitute the arm a bell-crank, and pivot it, at the angle of the bell-crank, to the post,  
70 or a bracket, *g*, on the post, and connect it from the extremity of its shorter arm, by a link, *f*, to the street-arm above its fulcrum, whereby when the latter arm is raised or lowered the sidewalk arm is simultaneously and  
75 similarly moved.

It is quite common, where conditions so require, to form a gate with a single swinging arm for the barrier. My improvement, involving the operating cable weighted at op-  
80 posite ends, is also susceptible of advantageous use with this construction. Hence I do not wish to be understood as limiting my invention to the use with two-arm gates.

What I claim as new, and desire to secure  
85 by Letters Patent, is—

The combination with a balanced gate-arm, of a pulley upon the axis of said arm, a second pulley at the operating station, a cable connected to said pulleys, and weights suspended  
90 from the opposite ends of the same, substantially as described.

FRANK W. MILLS.

In presence of—

J. W. DYRENFORTH,  
M. J. SMALL.