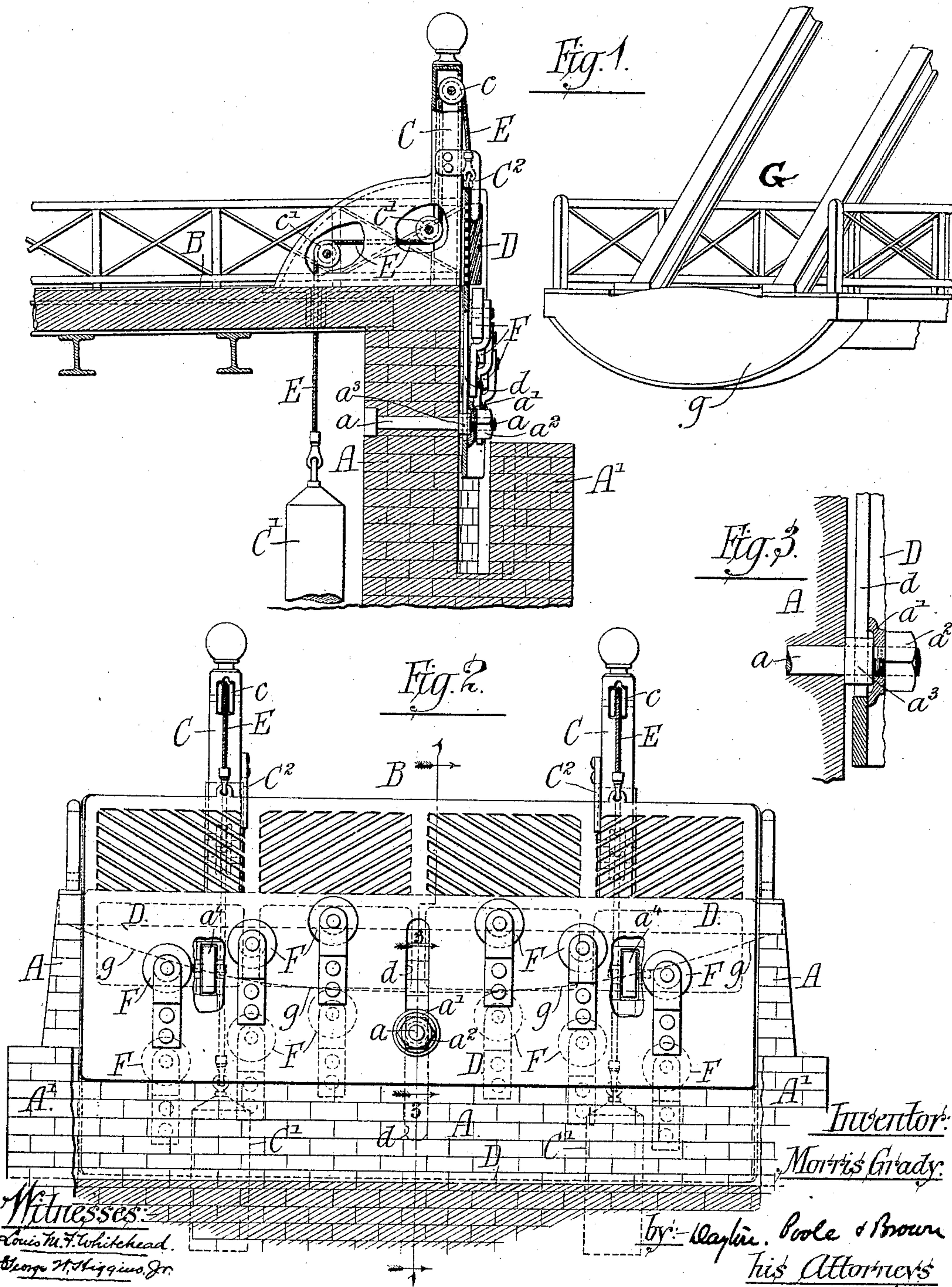


(No Model.)

M. GRADY.
BRIDGE GATE.

No. 463,313.

Patented Nov. 17, 1891.



Witnesses:
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UNITED STATES PATENT OFFICE.

MORRIS GRADY, OF CHICAGO, ILLINOIS.

BRIDGE-GATE.

SPECIFICATION forming part of Letters Patent No. 463,313, dated November 17, 1891.

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To all whom it may concern:

Be it known that I, MORRIS GRADY, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Bridge-Gates; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to bridge-gates, and more particularly to that class known as "automatic" gates, which are actuated by the movement of the swinging span of a pivoted bridge to guard the roadway when the draw is open.

It has for its object to provide a simple construction which may be readily applied to bridges, and will operate effectively to the desired end.

In the drawings, Figure 1 is a sectional view taken on line 1 1 of Fig. 2. Fig. 2 is an elevation of the face of the abutment and gate. Fig. 3 is an enlarged detail sectional view taken on the line 3 3 of Fig. 2.

In the drawings, A represents the abutment proper of the bridge, and A' the false abutment arranged in front of the same as a protection therefor.

B indicates the roadway, at each side of which is arranged a hollow column or pillar C, provided with an inclosed pulley c.

D represents the gate proper, which, so far as its body portion is concerned, may be of any suitable construction for the purpose of combining lightness and strength—such, for instance, as that shown. This gate is mounted on the front of the abutment A, being connected therewith by means of a pin or bolt a, fixed in the abutment and extending through a vertical slot d in the gate D, said pin being provided with a washer a' and nut a² to retain the gate and with a roller a³ arranged thereon within the slot to reduce the friction at this point. Upon the abutment A are mounted bearing-rollers a⁴, which serve to prevent contact between the gate and abutment and assist the smoothness of movement of the former. I have shown two of these rollers; but it is obvious that their number may be varied, as desired.

To each end of the gate there is attached a rope, chain, or other flexible connecting de-

vice E, and these ropes, after passing over the respective pulleys c of the columns C, are carried downward in said column and then under and over suitable guide-pulleys c', mounted in suitable supports. To the depending ends of the ropes E are attached actuating-weights C', which serve to hold the gate normally in a raised position and to restore it to such position when free to rise. The arrangement of these parts is similar on both sides of the roadway, the mechanism being in duplicate. The weights C' will of course be suspended in a suitable pit or open space to permit their free vertical movement.

On each of the columns C is located a stop C², and the contact of the gate D with these stops serves to limit its upward motion. These stops also extend over the outer face of the gate when it is raised to prevent displacement of the gate when in position to protect the roadway.

On the outer or exposed face of the gate D are located projecting rollers F, arranged in two diverging rows having jointly an inverted-V shape, as shown. These rollers are arranged in the path of the swinging-span G of the bridge, so that the successive contact of the end thereof with the said rollers will depress the gate as the said end rides over and forces them downward one after another. Most bridges of this type have a transverse end girder g, having a lower surface inclined upward at both ends, as shown, and when my improved gate is applied to such bridges this member g will be the portion of the swinging span which will have contact with the rollers F, and by its incline will facilitate the depression of the gate. It will thus be seen that my improved bridge-gate is adapted for application to most bridges without any alteration whatever in the swinging span and with very slight additions to the abutments. In the case of bridges in which the end girder just described is absent a member similar to the girder g may be readily applied thereto. The inclination of this member is not strictly necessary, since the rollers may be so arranged that each one extends less than one-half its diameter above the next lower one, and it is obvious any desired number of rollers may be employed. I prefer, however, the construction and arrangement shown and described. It will of course be understood that in

centrally-pivoted bridges the mechanism described will be in duplicate at both ends of the bridge, so as to protect both abutments, and it is obvious that whether the swinging span be swung completely around or turned in either direction it will, by its engagement with the rollers on the gates, depress these latter as it comes into line with the abutments and hold them depressed, as shown in dotted lines in Fig. 2, while the bridge is open for land traffic. When swung to open the draw for water traffic, the swinging span passes clear of the gates, and these latter being free to rise the actuating-weights C' will carry them upward into the position shown in full lines in Fig. 2 and hold them in that position until they are again depressed by the closing of the swinging span.

It will be noted that not only is the gate readily applied to bridges of the ordinary construction without alterations therein, but it will also be observed that the gate is so mounted that all lateral guides are dispensed with and the binding and sticking due to the use of these guides obviated, this binding arising from the direct lateral pressure of the bridge upon the gate when it is held between vertical guides and being frequently sufficient to prevent vertical movement of the gate. In my construction the single bolt and roller, in conjunction with the slotted gate and actuating-weights, serve to sufficiently guide and hold the gate during its operation without any binding whatever. From this construction it follows that the gate is free to tilt upon the central pin under abnormal pressure, any tendency to tilt being, however, resisted under normal circumstances by the weights which are connected to the ends of the gate.

It will be observed that the two uppermost rollers F on the gate proper are arranged at some distance on each side of the central line thereof at an equal height, so that when the swinging span is in position to hold the gate down it will have a broad bearing at two widely-separated points upon the said gate, and will thereby prevent tilting or lateral vibration while the gate is depressed.

It will be observed that the rollers F are of equal diameter, being duplicates of each other, thereby securing cheapness of construction and facility for repairs.

I am aware that it has heretofore been proposed to place a plurality of rollers upon the end of the swinging span of a bridge to be employed in conjunction with a vertically-movable gate mounted on the abutment and provided with a double incline or cam face, such a construction being set forth in Letters Patent No. 428,079, granted May 20, 1890, to Patrick H. Day. In this construction it will be noted that the bridge must be provided with a special device—to wit, rollers—in order to operate the gate, whereas in my construction the bridge is in most cases already adapted for the purpose, as has already been herein pointed out, without any change what-

ever, and in case some special provision is necessary the inclined end girder may be readily attached. It will also be noted that when the rollers are thus mounted on the bridge they are in a position where they are exposed to injury not only from contact with passing vessels while the bridge is swinging, but they are also subjected to the injurious effects of the smoke and gases from tug-boats passing under the bridge while it is closed, which smoke and gases, as is well known, tend to corrode the rollers, making them liable to stick in their bearings and ultimately destroying them. This disadvantage of position is obviated in my construction by placing the rollers upon the gate, in which location they are not exposed to injury. Moreover, it will be seen that when the rollers are mounted upon the gate access may be conveniently had to them for the purpose of oiling, inspecting, and repairing them, whereas if placed upon the swinging span access to them for these purposes is extremely inconvenient and at times impossible.

What I claim is—

1. The combination, with an abutment, of a vertically-movable gate mounted thereon and having projecting rollers of equal diameter on its outer face arranged in downwardly-diverging rows, a swinging span adapted to bear on said rollers successively to depress the gate, and actuating-weights to raise the gate when free.

2. The combination, with an abutment, of a movable gate mounted thereon and having projecting rollers of equal diameter on its outer face arranged in downwardly-diverging rows, a swinging span provided with a transverse member inclined, as described, to bear on said rollers successively to depress the gate, and actuating-weights to raise the gate when free.

3. The combination, with an abutment, of a vertically-movable gate centrally guided thereon and capable of tilting upon its guiding devices, actuating-weights to raise said gate connected thereto on each side of the central guiding devices to maintain the gate in horizontal position, rollers mounted on the gate in downwardly-diverging rows, and a swinging span adapted to bear on said rollers to depress the gate.

4. The combination, with the abutment provided with guide-bolt *a*, having roller *a*³, and bearing-rollers *a*⁴, of the gate provided with a vertical slot *d* for said bolt and its roller, actuating-weights to raise said gate, and a swinging span to depress said gate, substantially as set forth.

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.

MORRIS GRADY.

Witnesses:

TAYLOR E. BROWN,
IRVINE MILLER.