(No Model.) 2 Sheets—Sheet 1.

# R. P. LAMONT.

## COUNTERBALANCE FOR BRIDGES.

No. 503,377. Patented Aug. 15, 1893.

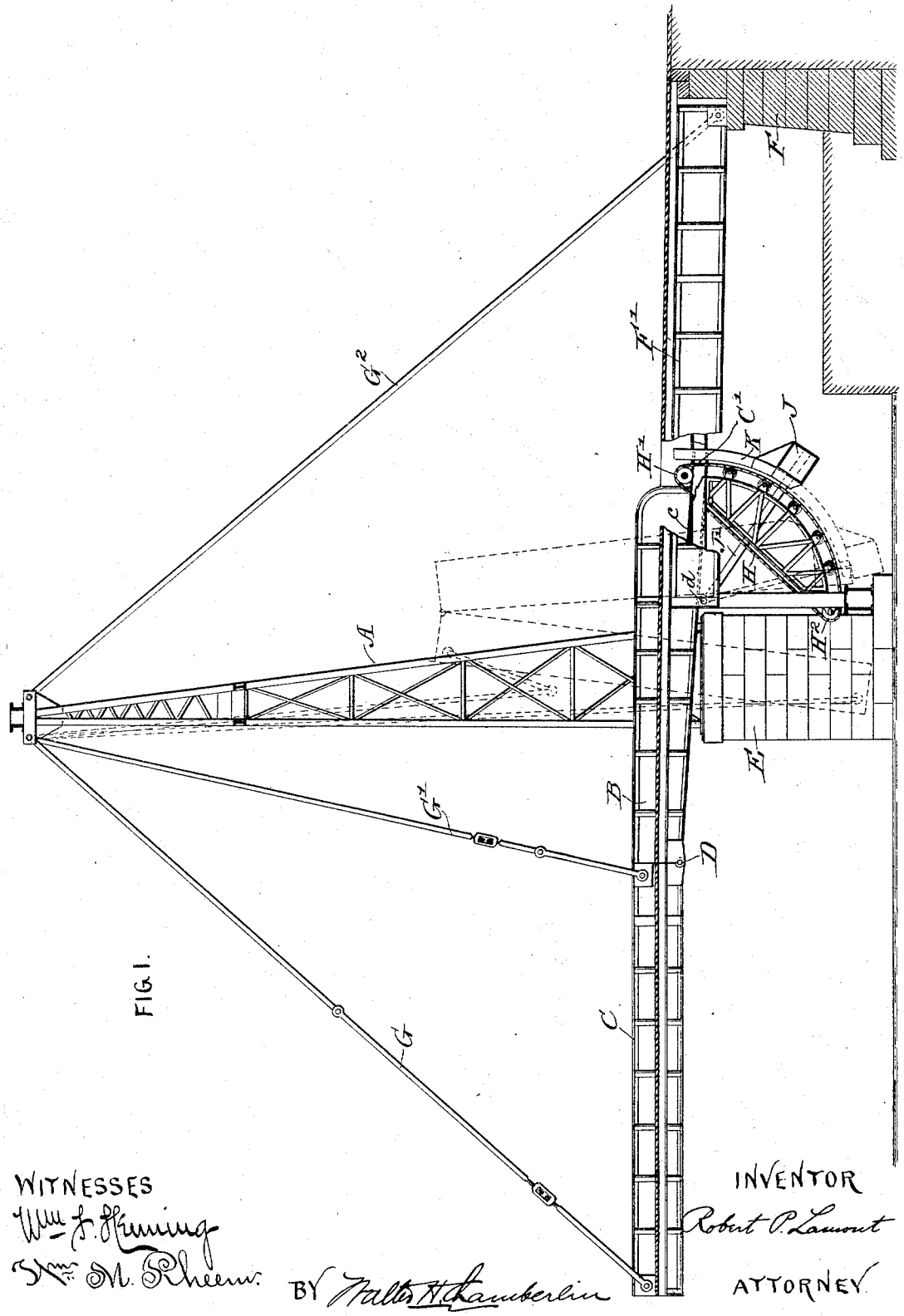


FIG. 1.

WITNESSES
Wm. F. Fleming
Wm. M. Rheem.

INVENTOR
Robert P. Lamont

BY Walter H. Chamberlin

ATTORNEY

(No Model.) 2 Sheets—Sheet 2.

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## COUNTERBALANCE FOR BRIDGES.

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FIG. 2.

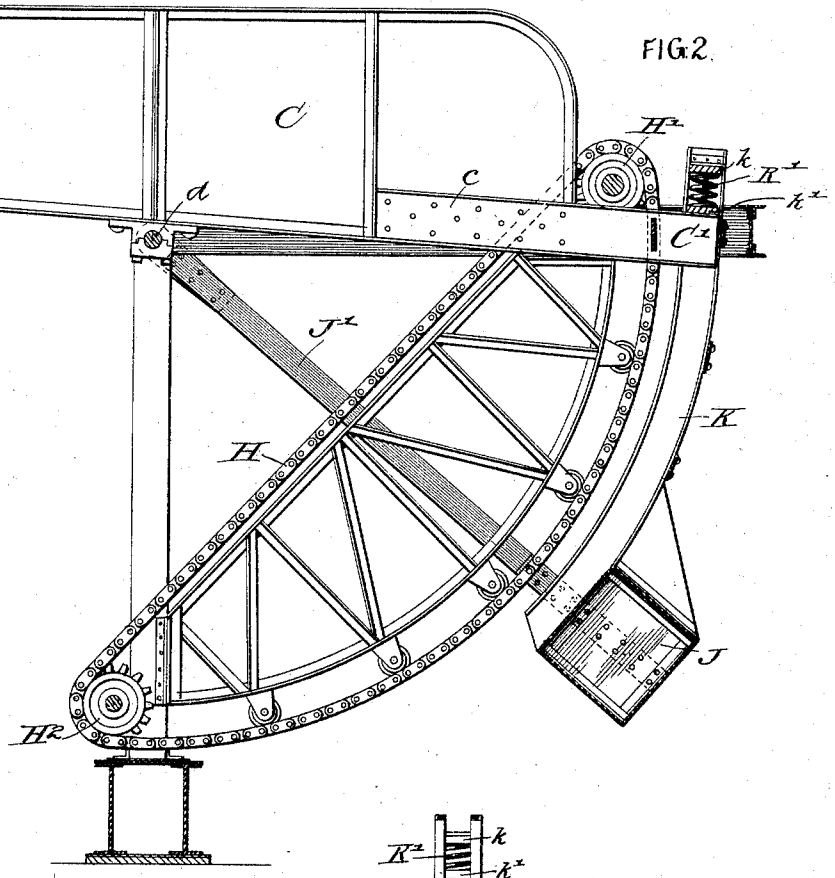



FIG. 3.

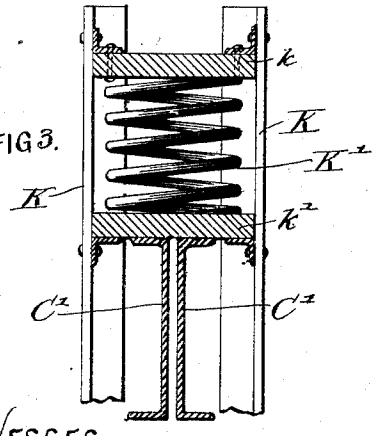
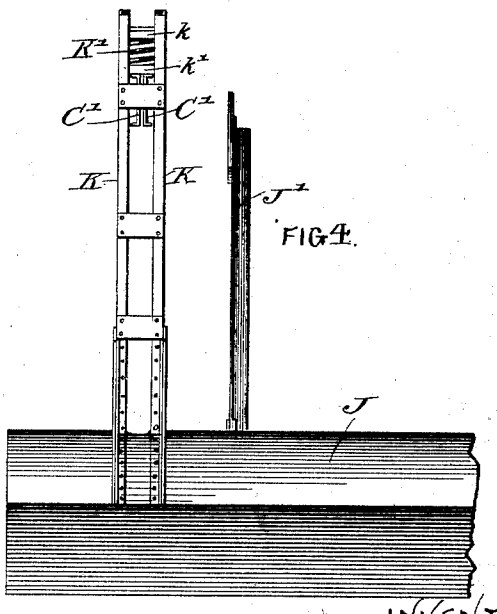



FIG. 4.




WITNESSES
Wm. F. Fleming
Wm. M. Rheem.

INVENTOR
Robert P. Lamont
BY Gallod & Chamberlin
ATTORNEY.

# UNITED STATES PATENT OFFICE.

ROBERT P. LAMONT, OF CHICAGO, ILLINOIS.

## COUNTERBALANCE FOR BRIDGES.

SPECIFICATION forming part of Letters Patent No. 503,377, dated August 15, 1893.

Application filed November 25, 1892. Serial No. 452,977. (No model.)

*To all whom it may concern:*

Be it known that I, ROBERT P. LAMONT, a citizen of the United States, residing at Chicago, county of Cook, State of Illinois, have invented a certain new and useful Improvement in Counterbalances for Bridges; and I declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention has for its object the production of a counter-weight for that style of folding draw-bridge known as the Bascule bridge. In this style of bridge a pier is built on each side of the stream to be spanned, and from each pier extends one-half of the bridge, the two halves meeting in the center. Each half is composed of two sections pivoted together, and when it is desired to open the bridge, power is applied and the outer end of the section nearest the pier is raised. This raises the end of the outer section which is pivoted to the inner section, and the other end of the outer section drops down so that when the two sections, or portions of the bridge, are in a vertical position, their faces are substantially to, and adjacent with each other.

This invention relates more especially to a means for counter-balancing the sections as they are raised. As will be observed when the power is applied to raise the inner or landward section, the outer section must also be raised, but as they assume a perpendicular position, the weight of the outer end of the outer section begins to act as a counter-weight. In other words, the center of gravity instead of taking a regular curve, moves in an irregular curve necessitating considerable of a counter-weight at the beginning of the movement to open the bridge, and requiring less and less as the bridge is opened. I have therefore so constructed a weight and connecting apparatus that it will bear upon, and aid in the movement of the sections until they have accomplished about one-half, more or less, of the movement, when the weight is removed.

The invention consists in a combination of devices and appliances hereinafter described and claimed.

In the drawings: Figure 1. is a side elevation of one-half of a draw-bridge embodying my invention. Fig. 2. is a side elevation on an enlarged scale of a portion. Fig. 3. is a detail view. Fig. 4. is a rear elevation of a portion.

In carrying out the invention A represents the tower, made up of a skeleton frame work from which the cables and rods which support the bridge extend. The particular form of this tower is immaterial.

B is the inner or landward section of the bridge mounted on trunnions *d*, and C is the outer section of the bridge, the sections B—C being pivoted together as at D.

E is the pier from which the tower is supported, and F the abutment and anchorage.

G is a rod or cable extending from the tower to the outer end of the outer section, and G′ is a rod or cable extending from the tower to the inner end of the outer section.

$G^2$ is a rod or cable extending from the tower down to the anchorage.

F′ is the permanent portion of the bridge extending from the abutment to the pier.

H is a sprocket chain, which together with the sprocket wheels H′—$H^2$ forms a means for applying power to open and close the bridge, but as this is claimed by me in a concurrently pending application, Serial No. 452,978, filed November 25, 1892, I will not further describe the same.

Extending rearwardly from the inner end of the section C, and rigidly engaged to said section at *c* is the arm C′, preferably made up of two channel irons, as shown in Fig. 3.

J is a box of any suitable size containing concrete, or any other suitable ballast. It extends transversely across from side to side of the bridge. J′ is an arm rigidly engaged to said box and pivoted to the trunnion on which the section C of the bridge turns.

K—K are two parallel arms, or beams rigidly engaged at their lower ends to the box J, and connected at their upper ends by the plates *k*. Held between this plate *k* and the plate *k′* is a spring K′. The plate *k′* is not engaged to the arms K, but acts as a follower to press against the spring K′. When the

bridge is closed, or in its normal position the arm C′ supports the upper ends of the arms K, and as the arms are directly connected with the box J the weight of the latter is transmitted to the arm C′, and thence to the inner end of the section C. It will thus be observed that the weight of the box J and its contents bear upon, and counter-balances the section C, and as the bridge is opened helps to raise the section until the box J has dropped down so that the arm J′ is substantially vertical. By this time the section C has completed about one-half of its travel, more or less, but by this time also, the section B, the outer end of which drops down, has passed the point where it is a burden, and it begins to be a help by contributing its weight to balance the weight of the section C. A counter-weight on the section C is therefore unnecessary, and as the box J and its contents comes to a rest, the arm C′ leaves its bearing against the spring K′, and travels between the arms K until the bridge has been opened to its full extent, and the sections are in a substantially vertical position as shown by the dotted lines Fig. 1. When the bridge is to be closed, of course the two sections will balance each other until a point is reached about one-half way, more or less, of their travel. At this time the arm C′ comes to a bearing against the upper ends of the arms K, and it picks up the latter and their accompanying weight J. It will thus be seen that at the time when the counter-balance is needed, that is at the beginning of the movement, to open the bridge, it has a bearing upon the bridge at the proper place, and when it is no longer necessary, the bridge is relieved of its weight, and is independent of it.

What I claim is—

1. In a bridge the combination with a section of a bridge pivoted so that when power is applied one end is elevated, and the other end is depressed, of a counter-weight engaged to one end of said bridge when the bridge is closed and adapted to contribute its weight during the initial movement in opening, and a stop in the path of the weight to prevent the latter from bearing on the bridge during the entire movement in opening, substantially as described.

2. In a bridge the combination with a section of the bridge of a weight suspended from one end of said bridge by arms, and a stop in the path of the weight to prevent the latter from contributing its weight to the bridge section throughout the entire movement of the latter, substantially as described.

3. In a bridge the combination with a tilting section thereof, of an arm extending therefrom, a weight suspended from said arms by arms K, said weight caused to travel in the arc of a circle by the arm J′, and a stop to prevent the arms K from bearing on the bridge section throughout the length of its travel, substantially as described.

4. In a bridge the combination with a tilting section thereof, of the arm C′ extending from the rear end thereof, the weight J suspended from said arm by the arms K, a space being left between the arms K through which the arm C′ can travel after the arms K have been stopped in their movement, and a spring between the upper ends of said arms K, against which the arm C′ can bear, substantially as described.

In testimony whereof I sign this specification in the presence of two witnesses.

ROBERT P. LAMONT.

Witnesses:

W. H. CHAMBERLIN,

J. RAYHILL.