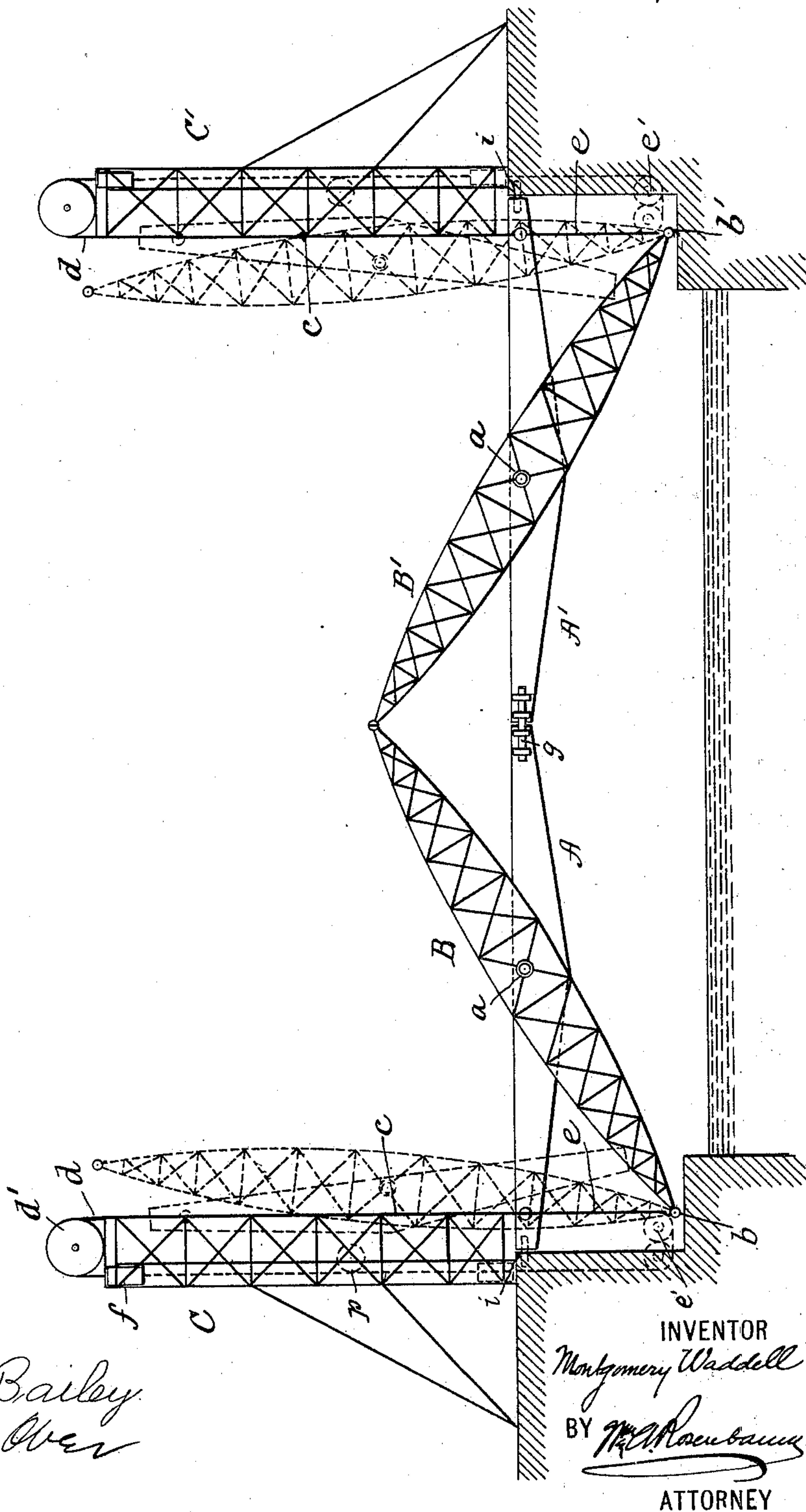


(No Model.)

M. WADDELL.
DRAWBRIDGE.

No. 598,168.

Patented Feb. 1, 1898.



WITNESSES:

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DRAWBRIDGE.

SPECIFICATION forming part of Letters Patent No. 598,168, dated February 1, 1898.

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To all whom it may concern:

Be it known that I, MONTGOMERY WADDELL, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Drawbridges, of which the following is a full, clear, and exact description.

This invention relates to opening or draw bridges in which the opening span is in two parts, meeting at the center and adapted to lift or fold to the opposite sides of the gap over which the bridge is constructed.

According to my invention the two floor-spans, when the bridge is closed, are supported upon a hinged arch formed by two parts of shear-legs, which are pivoted at the piers on each side and are adapted to come together at their outer ends to form the arch. The floor-spans are pivoted to the legs, respectively, and are raised from their inner ends in a vertical direction, so as to cause the legs and floor-span to fold together on each side into substantially the same upright plane, the action being similar to the movement of the two members of a pair of shears when one handle is held stationary while the other is lifted. On each side a tower is erected in which the raising and lowering devices are rigged and in which a suitable guide is constructed for the inner or shore end of the floor-span. By this construction and action the "bending moment" of the tower is always comparatively small while the bridge is being moved, and the floor-spans when in their closed position are well supported by the arch then formed by the two legs.

Referring to the accompanying drawing, in which the figure is a side elevation of the complete bridge in so far as necessary to illustrate the principle of my invention, A and A' represent the two floor-spans.

B and B' represent the two shear-legs, and C and C' represent the two towers.

The floor-spans are pivoted to the shear-legs at *a* or at any other point intermediate of the extremities of both the leg and the span. The legs are pivoted, respectively, at the points *b* and *b'* in the piers on opposite sides of the river or gap over which the bridge is constructed.

The tower is provided with a vertical guide

c, with which the inner end of the floor-span engages. A lifting-rope *d* is attached to the inner end of the span and leads over a sheave *d'* at the top of the tower and thence to any suitable motor *p*, and a lowering-rope *e* is also attached to the same end of the span and leads in an opposite direction over a guiding-sheave *e'* to the same or a different motor, as desired. A suitable counterweight *f* is used to balance the dead-weight of the moving parts of the bridge.

The normal or closed position of the bridge is shown in the figure, wherein the two shear-legs stand at upwardly-inclined equal angles and rest against each other at their outer extremities, forming a hinged arch, upon which the greater portion of the weight of the bridge and any load that may be put upon it is supported. The tipping of the ends of the floor-spans is prevented by the raising and lowering ropes *d* and *e*, which are immovable, except when the motor or motors are in action, or by bolts *i*, and distribution of the weight in the middle of the bridge may be made by interlocking the abutting ends of the floor-span with a sliding bolt *g* or other means.

When the bridge is to be opened, the motors are rotated in such a direction as to lift the inner ends of the floor-span along the vertical guides in the towers. This causes the legs B and B' to separate and swing upward toward the respective towers, while the outer ends of the floor-spans swing downward until the spans and legs are folded together in substantially the same plane as indicated in the dotted lines. To lower or close the bridge, the motor is reversed, the draft being put upon rope *e*, and the inner ends of the floor-spans are lowered positively, thus causing the two legs to swing outward and the outer ends of the spans to approach each other until the legs come together and form the arch. The lowering may also be done by gravity.

It will be observed that inasmuch as the draft devices act in a vertical direction the strain upon the towers is a compression which may be resisted by comparatively light metal work. It will also be seen that inasmuch as the center of gravity of the floor-span and leg is most distant from the tower when the inner end of the floor-span is at the base of

the tower the bending moment of the tower will be comparatively small. In other words, as the inner end of the floor-span rises to a point where the lateral pull of the weight of
5 the moving bodies would effect it most the said bodies have reached a position near to the tower.

One or more shear-legs may be used for each floor-span. If one is used, it would preferably work in a slot formed along the center longitudinal line of the bridge. If two
10 were used, one would be placed on each side, and if three one would be in the middle and one on each side.

15 Having thus described my invention, I claim—

1. In a drawbridge the combination of two floor-spans and two supporting trusses or levers respectively therefor, the spans and levers
20 crossing each other and being pivoted together at their crossing-points, one end of each lever being pivoted at a fixed point while their opposite ends are adapted to rest against each other to form an arch supporting the floor-
25 spans, and means for raising and lowering

the inner or shore end of each floor-span in a vertical direction, to thereby swing the floor-spans and levers to or from their normal positions.

2. In a drawbridge the combination of two floor-spans and two supporting trusses or levers respectively therefor, the spans and levers crossing each other and being pivoted together at their crossing-points, one end of each lever being pivoted at a fixed point while
30 their opposite ends are adapted to rest against each other to form an arch supporting the floor-spans, and means for raising and lowering the inner or shore end of each floor-span in a vertical direction, to thereby swing the floor-
35 spans and levers to or from their normal positions, and means for interlocking the abutting ends of the floor-spans.
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In testimony whereof I subscribe my signature in presence of two witnesses.

MONTGOMERY WADDELL.

Witnesses:

FRANK S. OBER,
HARRY BAILEY.