A. J. POST.

Lift-Bridge.

No. 162,576. Patented April 27, 1875.

Fig: 1.

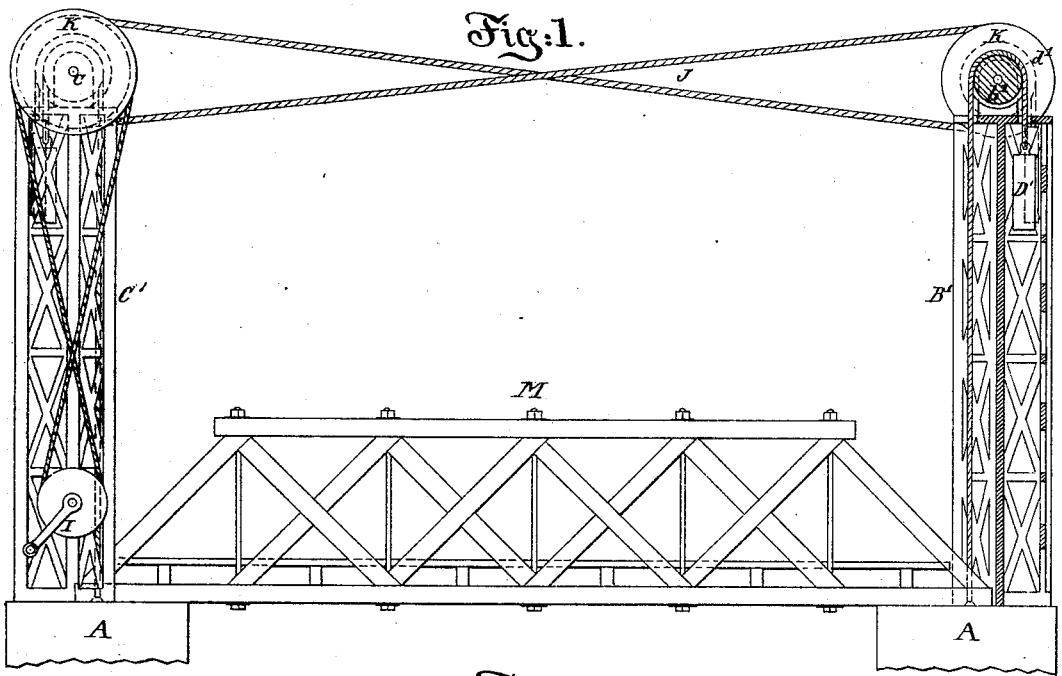
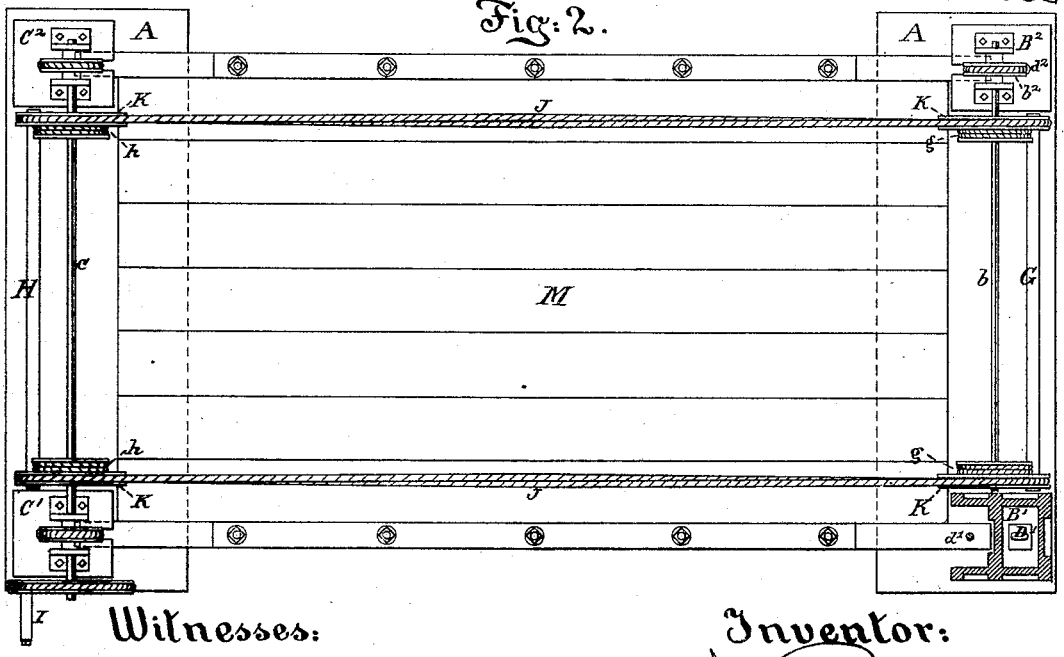


Fig: 2.



Witnesses:

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UNITED STATES PATENT OFFICE.

ANDREW J. POST, OF JERSEY CITY, NEW JERSEY.

IMPROVEMENT IN LIFT-BRIDGES.

Specification forming part of Letters Patent No. **162,576**, dated April 27, 1875; application filed August 25, 1874.

To all whom it may concern:

Be it known that I, ANDREW J. POST, of Jersey City, Hudson county, New Jersey, have invented certain Improvements relating to Movable Bridges, of which the following is a specification:

I have experimented with the bridge for use in carrying the ordinary traffic of a street over a canal; but the invention may be useful for other purposes, and in various other situations.

I lift the bridge bodily and lower it again upon its firm bearings for use after the boat has passed. I provide four stout sheaves or chains—one at each corner of the structure—and balance, or approximately balance, the load on each by suitable weights. The power I have applied to overcome the resistance has been furnished by a small steam-engine and boiler in a small house near the foot of one of the towers. The bridge is guided as it rises and lowers, to prevent being disturbed in position by gales of wind or other causes.

In the completed form of the invention there is a gate at each end of the bridge, which rises out of the way as the bridge sinks to its place, and is lowered again whenever the bridge is raised. The gates should also be guided, and may be important in preventing accidents.

My bridge requires no space on the ground for drawing back or turning around. It allows any required width of the canal for the use of the passing boat or boats, and it can be changed from the position of full-open to safety-shut in a very short period, with little power, and with a moderate outlay for construction.

The following is a description of what I consider the best means of carrying out the invention.

The accompanying drawings form a part of this specification.

Figure 1 is a side elevation, partly in section; and Fig. 2 is a plan view, partly in section.

Similar letters of reference indicate like parts in both the figures.

A is the masonry or other firm foundation, on which the towers stand, and on which the bridge rests when in position for use. B^1 B^2 are stout, upright, hollow frames or towers on one side of the canal, and C^1 C^2 are corresponding towers on the opposite side. Shafts *b c* are supported in bearings on the towers, on the respective sides of the canal. Stout sheaves b^1 b^2, firmly keyed on the shaft *b* in the position represented, carry cords or chains d^1 d^2, which are each secured at one end of the bridge M, and at the other to a weight, which is about equal in gravity to one-quarter of the bridge. The weight D is allowed to run up and down in the interior of the tower B^1, and the corresponding weights in the interiors of the respective corresponding towers. G and H are gates extending across the roadway at each end of the bridge, and suspended by cords *g h*, which, as the bridge rises, and the respective shafts *b c* are correspondingly turned, unwind from the drums represented carried on said shafts. The ends of the gates may be guided loosely in grooves in the towers.

The gravity of the gates should be allowed for in proportioning the balance-weights D^1 D^2, &c., to the weight of the bridge. I esteem it important in practice that the weights shall be made in separate pieces, adapted to allow of convenient addition and subtraction, as occasion shall require. This is especially important in cases of prolonged wet weather, which increases the weight of the wood-work of the bridge, and sometimes a fall of snow may occur before the canal is closed, and it may be more convenient to increase the weights than to be continually clearing the bridge.

To operate the bridge in both directions in opposition to friction, and in some cases to a considerable unbalanced weight, I have represented a hand-crank, I. In practice this may be replaced, when required, by a steam-engine of sufficient power to perform the work very rapidly. The power is applied directly, or through suitable belts or gearing, to the shaft *c*, so that the corresponding end of the bridge is raised or lowered by a very direct application of the motive force.

To obtain a similar motion at the other end of the bridge, I extend a cross-belt from one side of the canal to the other, at a sufficient height above the water. I prefer employing two such belts; but one may serve in any emergency, and three or a greater number may

be used for greater safety, if desired, in any case.

What I have termed belts are simply flexible connections adapted to communicate power by traction. Ropes of suitable size, of rawhide, leather, or manila may serve, but I esteem wire preferable. I have represented two belts, marked J J, that are made double the length of the bridge, and traversed in grooves in the large pulleys K K.

The bridge M may be floored with plank, and trussed in any approved manner. I esteem it preferable, however, to make the work as light as is consistent with a proper margin of safety.

I am aware that lifting bridges have been before known; but, so far as I have known, their two ends have been raised and lowered independently, with the obvious disadvantage thereto pertaining, or else the mechanism for raising and lowering has been positively connected by longitudinal shafts, requiring a stiff support extending across, and making a connection which has no capacity for a slip-motion, to allow the ends to adapt themselves to their seats.

My arrangement requires no stiff truss across, and allows each end, as also all the corners, to adjust themselves by the slipping of the belts. The belts, of wire, rope, or other material, should be tight enough to convey a fair amount of force; but running on smooth pulleys, the tendency is always to lift the end where the power is applied more rapidly than the other, and on lowering, if the counterbalance-weights offer proper resistance, to follow the same law. Whichever end or corner arrives first at its seat stops as soon as it makes a fair bearing thereon, while the belts and the lifting-cords mutually accommodate each other by slipping in their respective grooves until all the corners bear fairly. Any settling or disturbance of adjustment due to imperfect work or wear is thus promptly allowed for, and no mischief results.

I esteem the guiding of each corner in the respective cavities or grooves in the towers very important in working the bridge in sudden gusts or severe gales of wind.

I claim as my invention—

1. The flexible connecting belt or belts J, extending across between the towers on the opposite sides of the canal, in combination with the lifting bridge M, balancing cords or chains b^1 b^2, and the power applied at the base of one of the towers, all substantially as herein specified.

2. In combination with the lifting bridge M, the safety-gates G H, operated by the same shafts, *b c*, which operate the bridge, as and for the purposes herein specified.

In testimony whereof I have hereunto set my hand this 21st day of August, 1874, in the presence of two subscribing witnesses.

ANDREW J. POST.

Witnesses:

HENRY A. WISE,

EDWIN B. MORGAN.