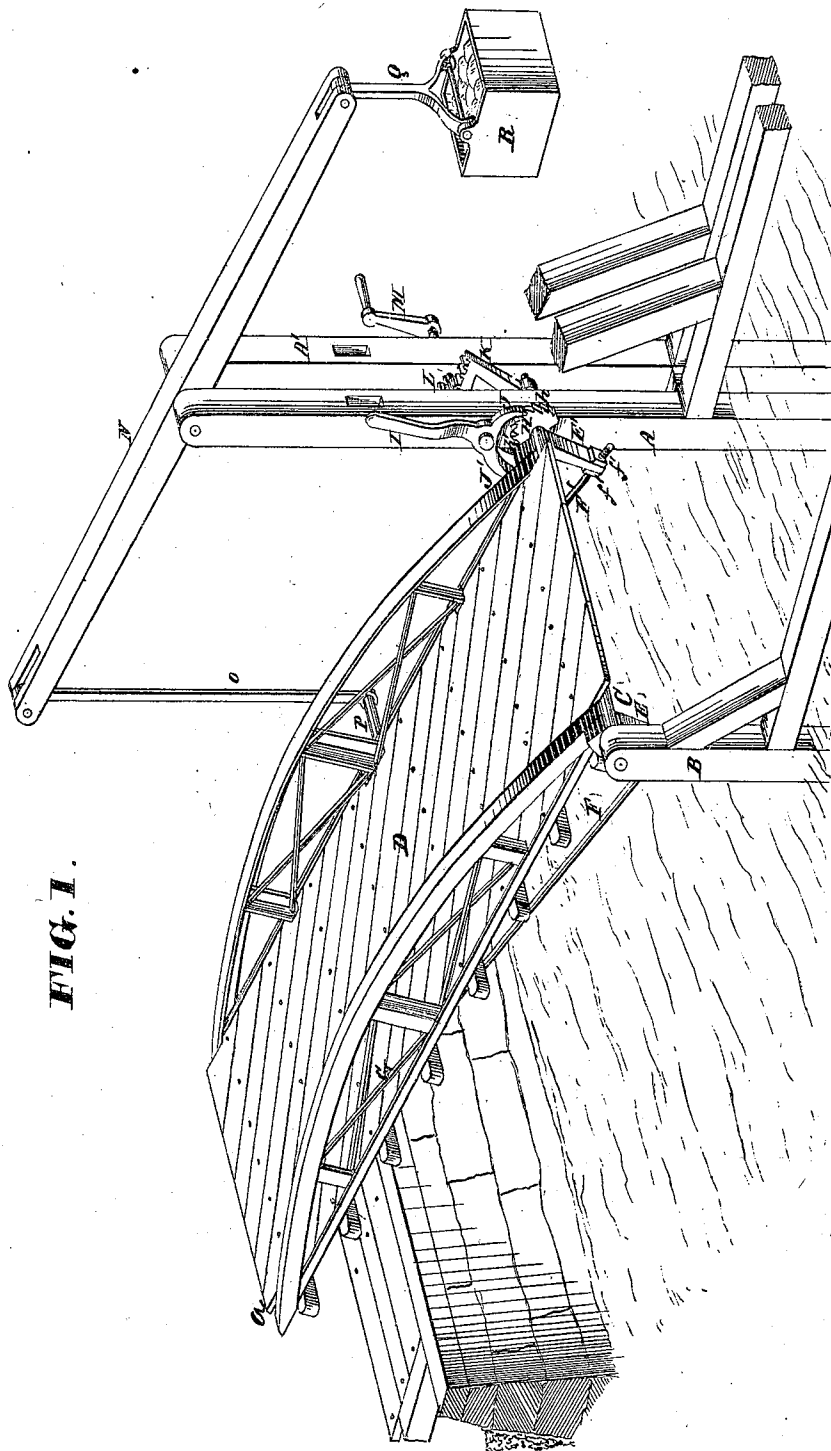


S. SWARTZ.
Lifting-Bridges.

No. 136,278.

Patented Feb. 25, 1873.



WITNESSES:

Gas. L. Ewin

Walter Allen

INVENTOR:

INVENTOR.
Samuel Swartz

By Knight Bros. Attorneys.

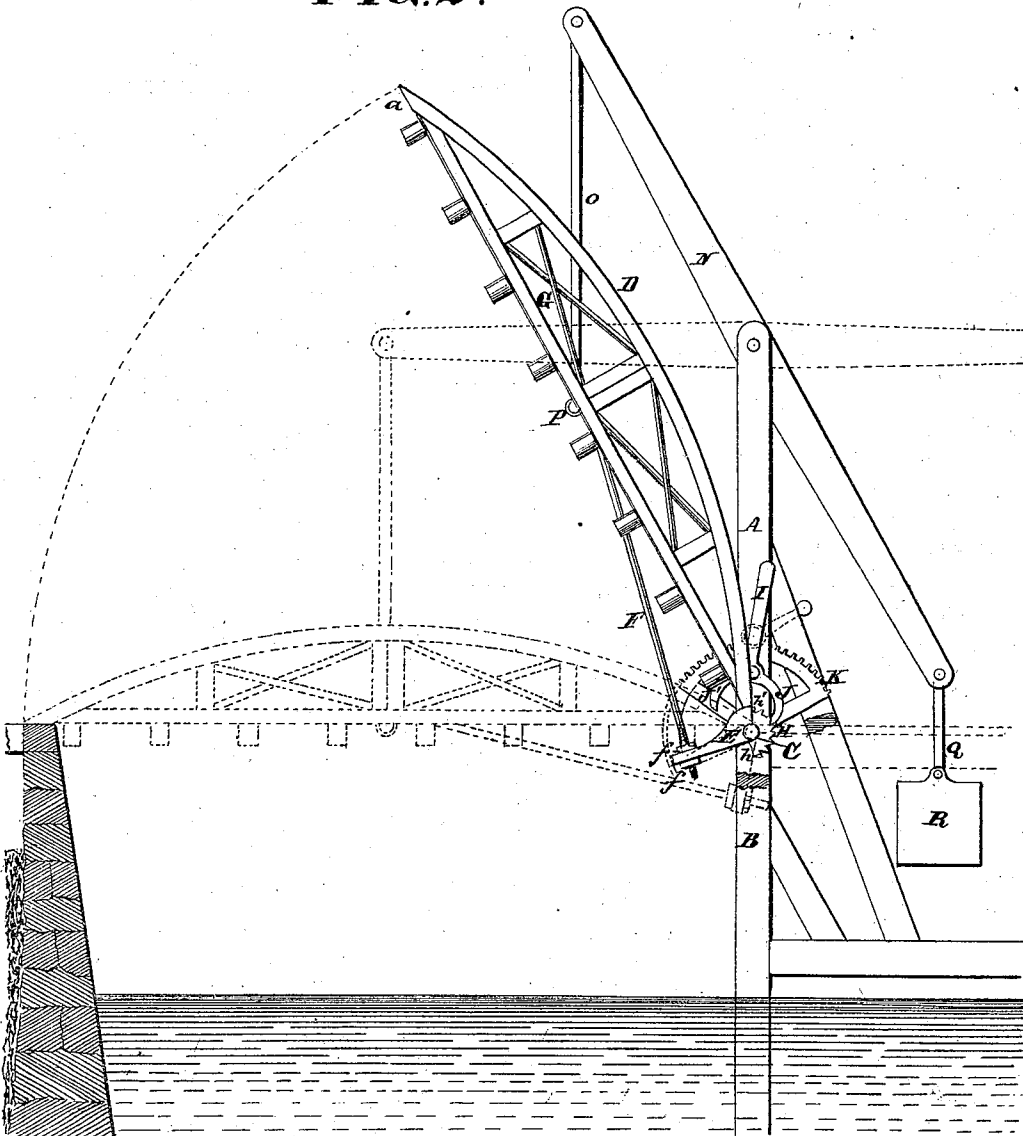
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FIG. 2.



WITNESSES:

Jas. L. Swine

Walter Allen

INVENTOR:

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UNITED STATES PATENT OFFICE.

SAMUEL SWARTZ, OF BUFFALO, NEW YORK.

IMPROVEMENT IN LIFTING-BRIDGES.

Specification forming part of Letters Patent No. 136,278, dated February 25, 1873.

To all whom it may concern:

Be it known that I, SAMUEL SWARTZ, of Buffalo, in the county of Erie, New York, have invented an Improved Lifting-Bridge, of which the following is a specification:

Nature and Objects of the Invention.

This invention, although applicable to draw-bridges in general, is more especially designed for those used on canal-slips and like narrow water-ways; and the invention comprises an improved plan for counterbalancing and lifting the bridge proper. The invention further comprises a means for supporting or securing the bridge in any desired position.

The construction and arrangement of the bridge is primarily intended to obviate any obstruction to the tow-line as applied to canal-slips.

Description of the Drawing.

Figure 1 is a perspective view of a bridge illustrating the invention, the bridge being shown slightly elevated. Fig. 2 is a side elevation of the same in the fully-elevated condition.

General Description.

Securely fixed in the bank of the canal, and on one side of the slip to be spanned, are two posts or stanchions, a little more distant from each other than the width of the bridge proper. Of these stanchions one, which, in the present illustration, is composed, in fact, of two similar posts, A A', is arranged on the inner side of the tow-path, and has an altitude about equal to half the length of the bridge. The height of the other post, B, is just sufficient to afford journal-bearing for one end of a pivot-shaft, C, whose other end has journal-bearings in the post A. To this shaft C is firmly attached the "heel" end of a suitable truss-bridge, preferably of the form represented at D. Projecting rectangularly or nearly rectangularly downward from the shaft C are arms E E', from which struts F F' proceed directly to the under side of and near the mid-length of the bridge, where they meet and coact with truss-rods G G', which constitute members of the bridge. The ends of the struts F F', which pass through the arms E E', are screw-thread-

ed to receive nuts f f', by means of which the said struts may be shortened or lengthened, so as to bring said struts to their proper strain and tautness, and to compensate for any torsional yielding of the shaft, or for any sag of the bridge proper, so as to maintain the remote corner a of the "toe" or free end of the bridge at its proper elevation relatively to the other parts of the bridge. This support or distribution of the strain and lifting-pressure may be still further aided and secured by diagonal planking, as shown in Fig. 1. Projecting upward from the shaft C is a semicircular ratchet, H, all of whose teeth h, save one or two, h', on the inner end, have their points directed reversely to the ascending rotation of the bridge, so as to enable the retention of the bridge at any desired elevation, or in horizontal position, by means of a catch-pawl, I, which has two claws, J J', of which claws one claw, J, is capable of being engaged in the teeth h and the other claw of being engaged in one of the teeth h', according as the handle I is thrown outward or inward. When the said handle I is in the vertical position neither one of its claws is engaged, and the bridge is then at liberty to be either elevated or depressed. The pivot-shaft C is also provided with a segment spur wheel or rack, K, in which gears a pinion, L. The shaft of this pinion is provided with a crank, M, by means of which the bridge is raised and lowered. The posts A A' have pivoted between them, near their upper ends, a balance-beam, N, whose length about equals that of the bridge proper, and whose inner end is connected, by a chain, cable, or rod, O, with a wrist, P, which projects from the bridge proper near its mid-length and below its center of gravity. From the other end of the beam N depends a chain, cable, or rod, Q, which is weighted with a counter-balance, R.

Operation.

The bridge proper and the counter-balance have such relative poise as to retain the bridge to its closed or horizontal position when down, and to operate to maintain a slight preponderating gravitation in the bridge until it approaches the entirely-open position, at which stage the preponderating portion of the bridge above the wrist, coming in aid of the counter-

balance, now operates to hold the bridge in the elevated or open position, as shown in Fig. 2.

It will be seen that the struts F F', with their nuts *f f'*, acting in conjunction with the truss-pieces G G', enable the lifting action on the wrist P at the middle of one side of the bridge proper to be transmitted equally to both sides of the bridge, and be effective at the end of the same remote from the pivot-shaft. It will also be seen that the bridge may be lifted and held as long as necessary at any height.

I am aware that a draw-bridge working on a horizontal pivot and counterbalanced to facilitate lifting it is not new; and this I disclaim.

Claims.

I claim as new and of my invention—

1. The horizontal pivot-shaft C with arms E E', the pivoted bridge D, the struts F F', the lifting mechanism K L M, and the balance-beam N with the counter-weight R, arranged, as described, to leave a clear tow-path, and combined and operating substantially as set forth.

2. The arrangement of pivot-shaft C, having arms E E', struts F *f* F' *f'*, and truss-pieces G G', substantially as described.

3. The provision, on the pivot-shaft of a draw-bridge, of the ratchet H *h h'*, in the described combination with the catch-pawls I J J'.

SAMUEL SWARTZ.

Witnesses:

BENJ. H. AUSTIN, Jr.,
ARTHUR W. HICKMAN.