

W. F. Mcgregor.
Automatic Draw-Bridge Gate.
No. 222,146. Patented Dec. 2, 1879.

Fig 1

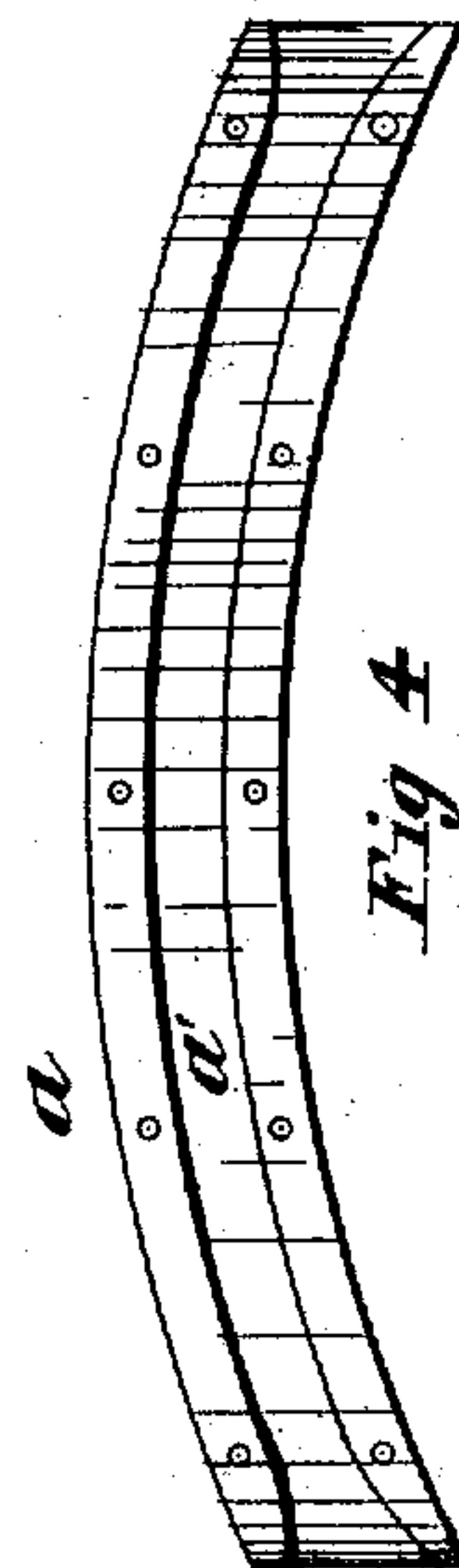
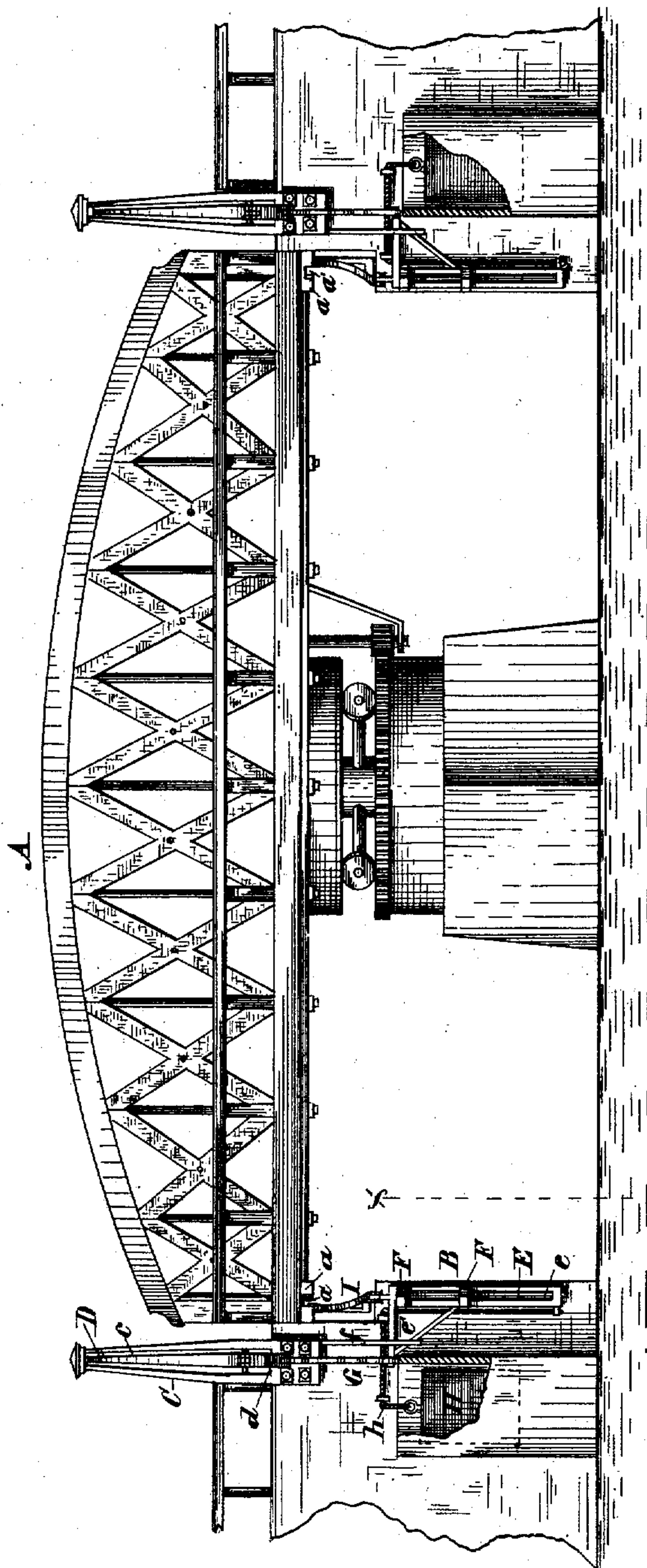


Fig 4

Witnesses

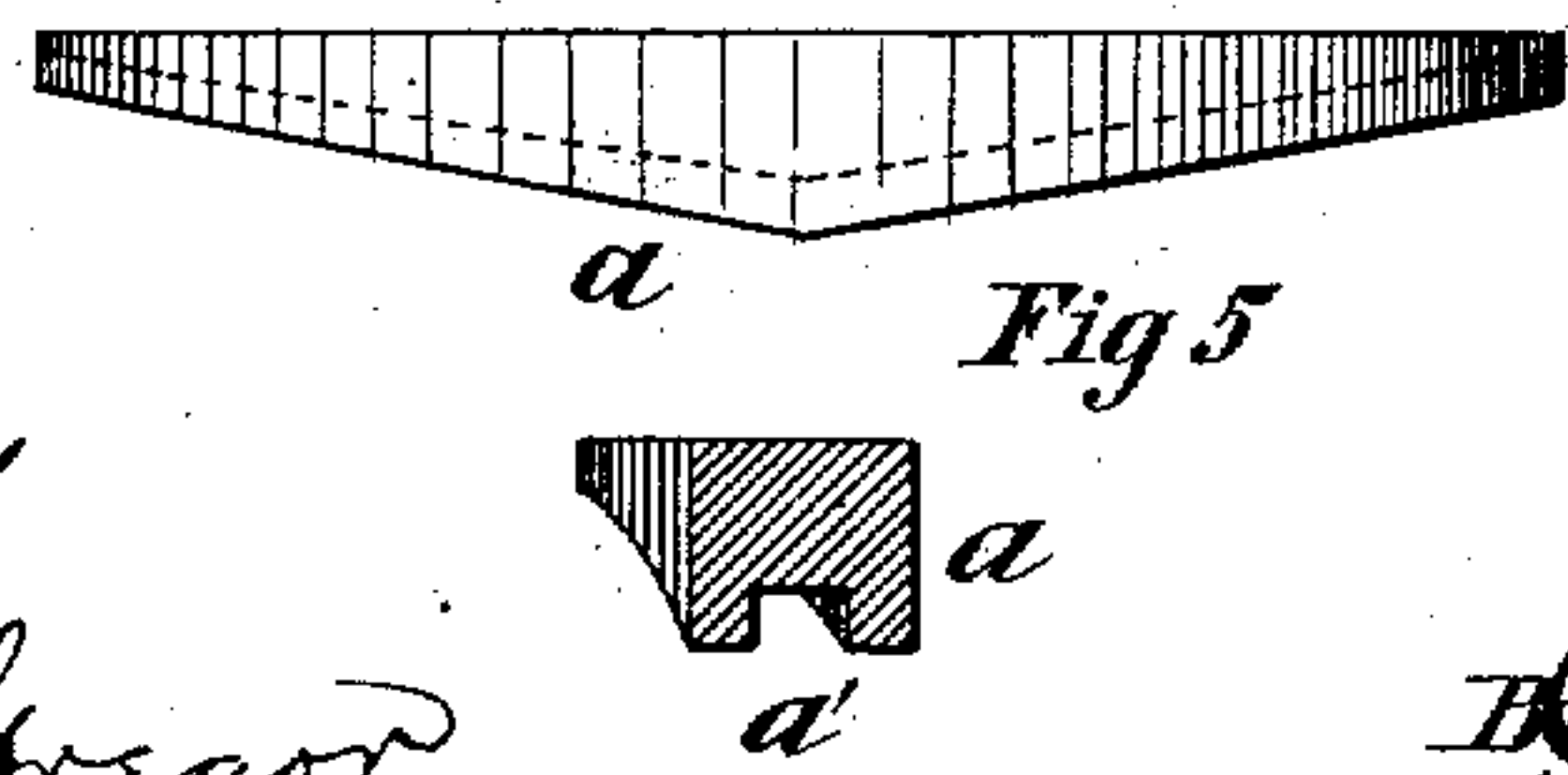
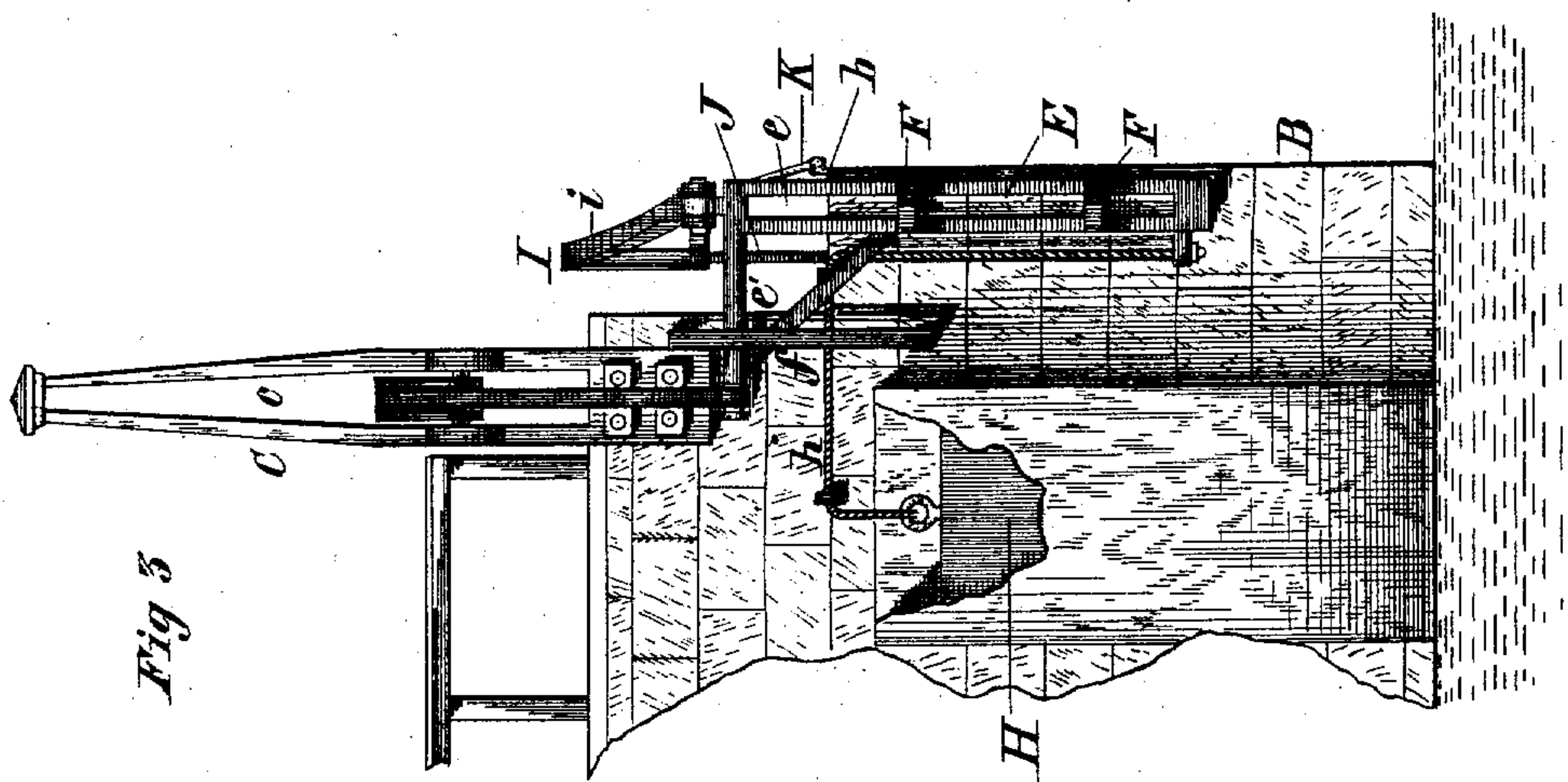
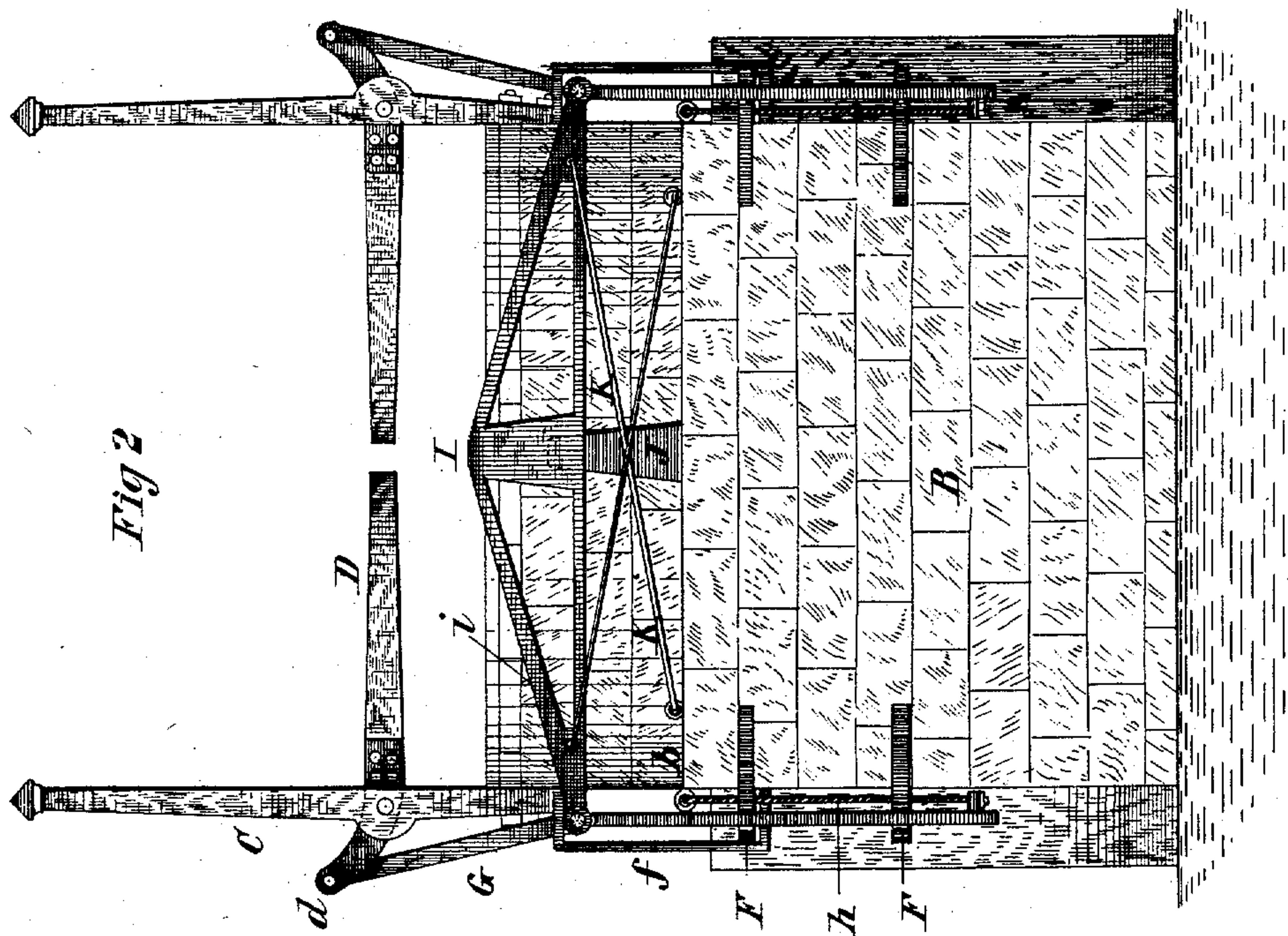
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UNITED STATES PATENT OFFICE.

WILLIAM F. MCGREGOR, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN AUTOMATIC DRAW-BRIDGE GATES.

Specification forming part of Letters Patent No. **222,146**, dated December 2, 1879; application filed September 10, 1879.

To all whom it may concern:

Be it known that I, WILLIAM F. MCGREGOR, of Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Automatic Gate for Swing-Bridges, which is fully described in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 represents a side elevation of a bridge and abutments with my improvement applied; Fig. 2, a front elevation, on an enlarged scale, of one of the abutments and gate in position when the bridge is open; Fig. 3, a side elevation of the same on a similar scale; Fig. 4, a bottom view of the grooved shoe or end piece which rides over and depresses the gate-opening apparatus; and Fig. 5, a side elevation and cross-section of a modified form of the same.

My invention relates to that class of gates which are closed automatically to bar the roadway when the bridge is opened and raised, or opened by the latter when it is turned back into a closed position.

The invention consists in special devices and combinations of devices for operating the gate-bars automatically to open and close the same, all of which will be hereinafter more fully described, and pointed out definitely in the claims.

In the drawings, A represents the bridge, which may be made of any ordinary construction known in turning or swinging bridges, and is suitably mounted to turn or swing on a pivotal support in the usual manner.

At each end of the bridge is an end piece or shoe, *a*, of metal or wood, secured to the under side of the bridge, and having a groove, *a'*, running lengthwise of its under face, as shown in Fig. 4 of the drawings. These end pieces are curved slightly like the ends of the bridge.

The abutments B are made in the usual way, so that the ends of the bridge close against them when the latter is turned to extend across from one abutment to the other.

Upright posts or standards C are firmly secured to the sides of the abutments, in this instance the standards being slotted, as shown at *c*, though this construction is not absolutely necessary.

The gate-bars D are constructed with a bent

end, *d*, and the bars are hinged or pivoted to the standards C, at or near the bend, so that the bent ends will project outside of the standards, as shown in Fig. 2 of the drawings. The gate-bars are of such length that each will reach about half-way across the street when lowered to a horizontal position, and they are arranged so that the bent ends will turn upward when the bars are pivoted to the standard, and are in a horizontal position.

An angular sliding frame, E, is arranged on each side of the abutment in a vertical position, being provided with a slot, *e*, in its vertical arm, through which the fastening bolts or bars F pass which secure the frames to the abutment, but at the same time permit them to move up and down.

The horizontal arm *e'*, at the upper end of the frames, is arranged to project inward at the sides of the abutment, and is passed under a suitable keeper, *f*, as shown in Figs. 2 and 3 of the drawings.

Link rods or bars G are hinged at their upper ends to the outer or bent ends, *d*, of the gate-bars, and at their lower ends to the arms *e'* of the sliding frames.

Drop-weights H are arranged at the sides of the abutments and connected, respectively, by ropes *h*, to the lower ends of the sliding frames E, the ropes being run over pulleys or through staples arranged considerably above the point of attachment of the ropes to the frames.

It will be seen from this description that when the sliding frames are depressed the gate-bars will be thrown upward by the pull on their outer ends through the link-rod, and the length of the weight-cords is such that when this movement is made the weights will be raised so that as soon as the depressing force is removed from the sliding frames the weights will immediately force them upward, thereby swinging the gate-arms downward into a closed position, as shown in Fig. 2 of the drawings, which will always be the position of the gate-arms when the weights are left free to act, as when the bridge is open.

Now, in order to raise the gate-bars automatically when the bridge is closed it is only necessary to provide some means for depressing the sliding frames, which will be operated by the closing of the bridge. To accomplish

this a truss-frame, I, is provided, of such length as to extend across the abutment from one sliding frame to the other. This frame is arranged with its straight member or tie-rod downward and just over the seats *b* of the abutments provided for the ends of the bridge. The ends of the truss-frame are hinged, respectively, to the upper ends of the vertically-sliding frames at the sides of the abutments, and the truss is curved slightly to correspond with the curved groove or track in the end pieces, *c*, of the bridge.

The parts are all arranged so that as the bridge is closed the grooved end pieces *a* will strike against the inclined members *i* of the truss-frame I, which are received in the grooves of the end pieces. The end of the frame I, against which the bridge strikes, will thus be depressed, and as the end of the bridge passes onward the entire truss-frame will be forced downward, thereby depressing both of the sliding frames, and so turning up the gate-bars out of the way.

The relative arrangement of the parts is such that when the bridge is entirely closed the truss-frame will be depressed, so as to rest upon the seats *b* of the abutments, thereby giving support to the ends of the bridge, and the gate-arms will be thrown up into or against their standards.

An upright guide-standard, J, is placed centrally on the seats of the abutments, which enters a suitable socket or guideway provided in the truss-frame, whereby the latter is guided in its vertical movement, and to some extent prevented from swaying sidewise. As an additional means for preventing side swaying, stay rods or cords K are provided, fastened, respectively, to each end of the truss-frame and to the opposite side of the abutment, as shown in Fig. 2 of the drawings, whereby the lateral thrust of the bridge as it strikes the end of the truss-frame is counteracted.

The central guide may be dispensed with, and some other suitable means for guiding the truss-frame substituted, being arranged at the respective ends of the frame, if desired.

The hinging of the truss-frame to the vertical frames is important, as it permits a yielding motion, allowing one end of the frame to be depressed at a time, thereby relieving the friction somewhat, which would be occasioned if these parts were rigidly connected.

If it is found necessary to provide additional means for the support of the ends of the bridge when closed, the end piece, *a*, may be set back a little, and an extra seat provided in the upper part of the abutment, on which the ends of the bridge will rest; or supporting-standards may be arranged on the seats *b*, at each end thereof, which may be made either stationary or movable, and, if desired, may be hinged and connected to the gate apparatus, so as to be turned down when the bridge is opened, and thrown up when the latter is closed.

The end pieces *c*, instead of being made of uniform thickness, as shown in Fig. 4 of the drawings, may be gradually increased in thickness from each end toward the center, as shown in Fig. 5 of the drawings, in which case the height of the truss-frame may be reduced, and the latter made somewhat lighter.

To relieve friction, rollers may be placed upon the end pieces of the bridge, or on the truss-frames, or on both, as may be desired.

A gate is thus provided which automatically closes across the street the moment the bridge is opened, thereby preventing accidents which frequently occur where no such safeguard is used, and at the same time the gate is automatically opened by the bridge itself as it is closed, so that no extra attendant is required.

The apparatus is comparatively simple and cheap, so that there can be little danger of derangement of the parts, and it may be applied to bridges without great expense.

It is evident that the special construction of some of the devices herein described may be modified, or other equivalent devices substituted, without departing from the principle of my invention; and I do not limit myself in all respects to the details of construction shown and described.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The pivoted gate-bars, in combination with the vertical slides arranged at the sides of the abutment, and connected to the ends of the gate-bars, respectively, and the drop-weights connected to said slides, substantially as and for the purpose set forth.

2. The gate-bars D, pivoted to the upright standard C, in combination with the vertically-sliding frames E, arranged at the sides of the abutments, the link-rods G, and the weights H, connected to the lower part of the slide E, substantially as described.

3. The slides E, in combination with a depressing-frame, I, extending across the abutment, and hinged at its ends, respectively, to the slides, substantially as described.

4. The swinging bridge A, in combination with the truss-frame I, vertical slides E, hinged, respectively, to the ends of the frame I, gate-bars D, and link-rods G, substantially as described.

5. The truss-frame I, in combination with the stay rods or cords K, arranged and secured to the abutment, substantially as described.

6. The swinging bridge A, provided with grooved end pieces *a*, in combination with the pivoted gate-bars D, vertical slides E, link-rods G, weights H, and truss-frame I, all arranged and operating substantially as described.

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Witnesses:

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