(No Model.) 2 Sheets—Sheet 1.

M. WHEELER.

GATE FOR SWING BRIDGES.

No. 370,669. Patented Sept. 27, 1887.

Fig. 1.

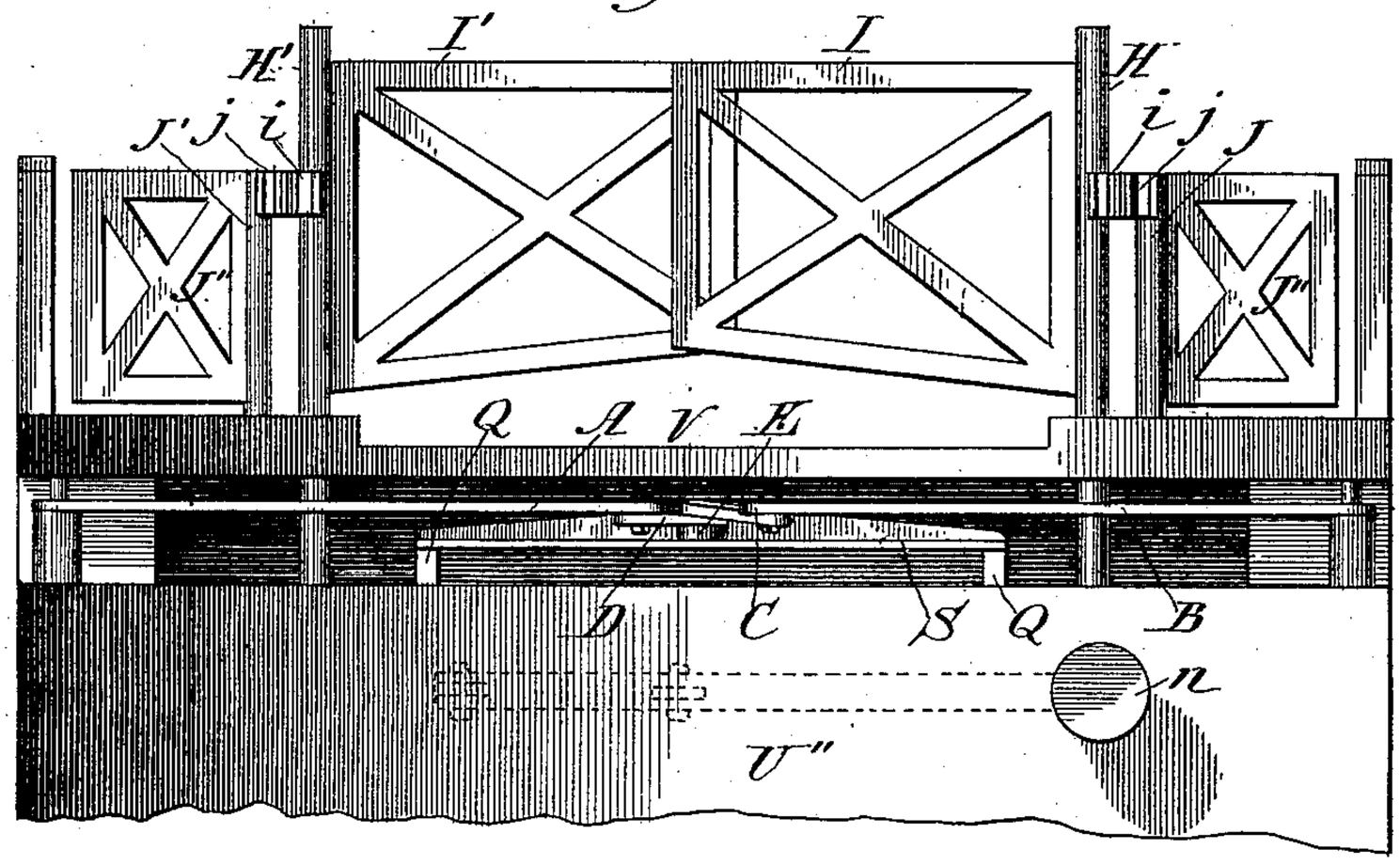
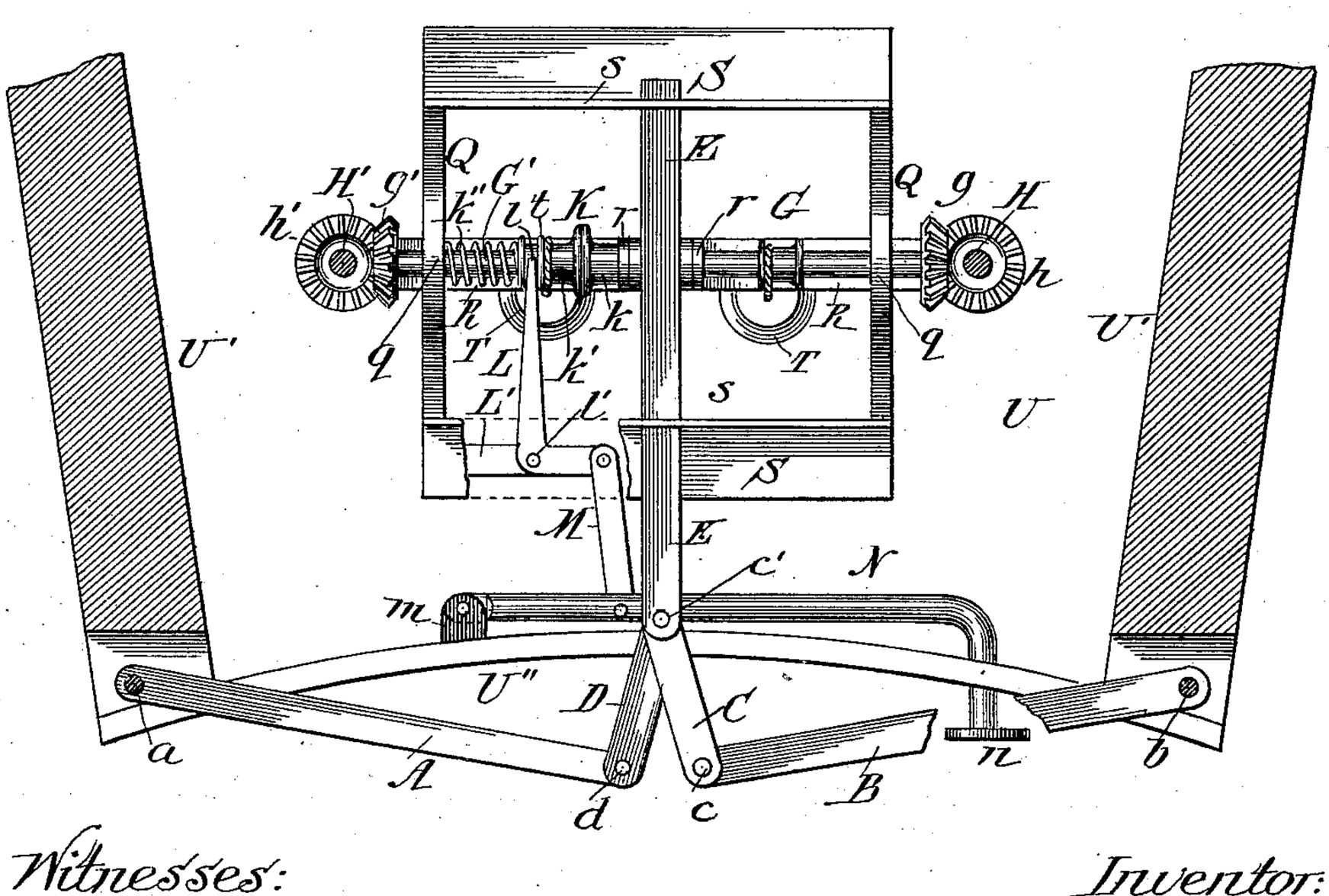


Fig. 2.



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Harry E. Jones.

Inventor:
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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

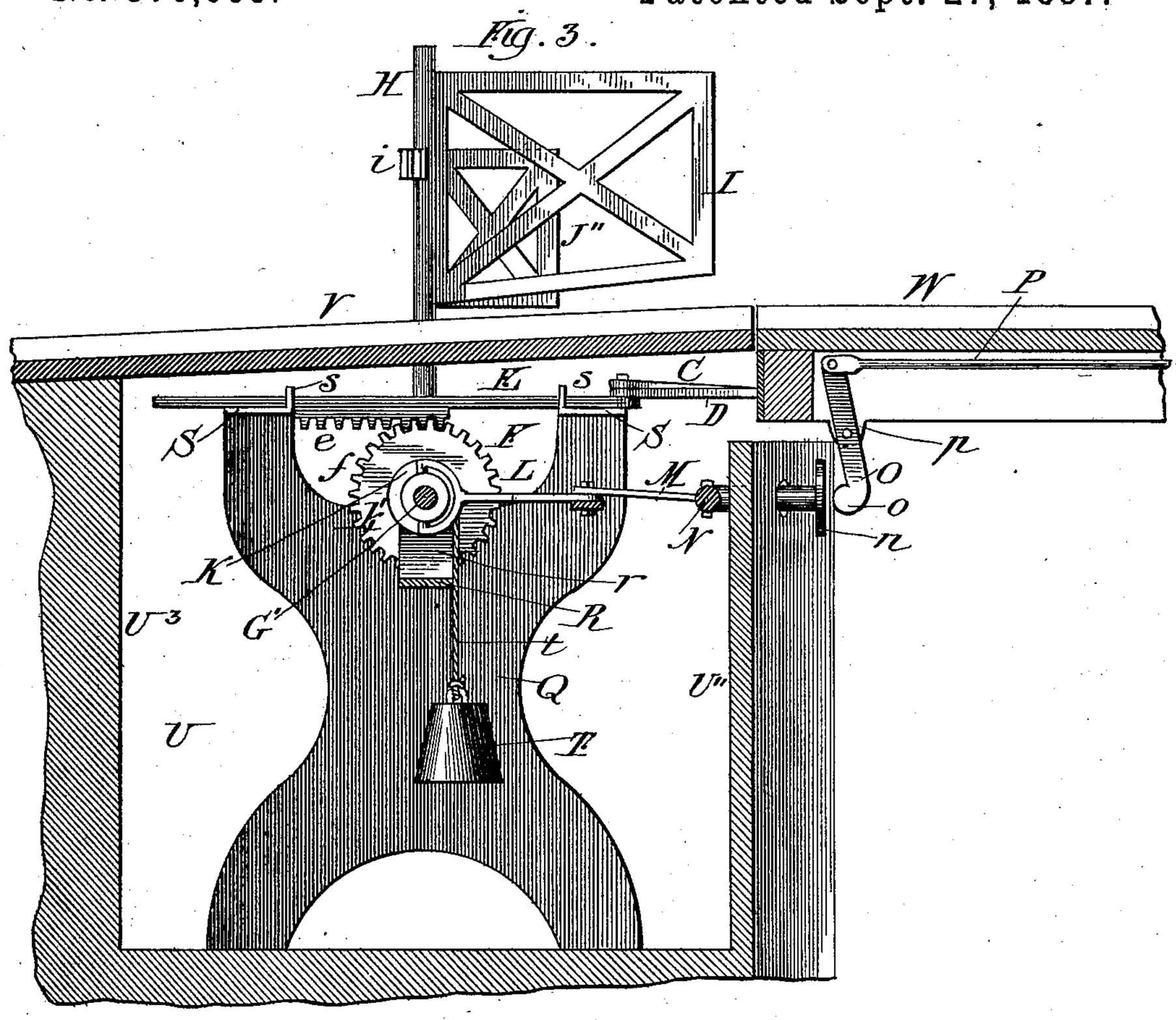
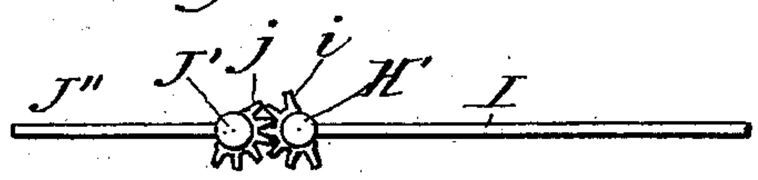


Fig. 4.



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Inventor:
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UNITED STATES PATENT OFFICE.

MAURICE WHEELER, OF CHICAGO, ILLINOIS.

GATE FOR SWING-BRIDGES.

SPECIFICATION forming part of Letters Patent No. 370,669, dated September 27, 1887.

Application filed February 18, 1887. Serial No. 228,085. (No model.)

To all whom it may concern:

Be it known that I, MAURICE WHEELER, residing at Chicago, in the county of Cook and State of Illinois, and a citizen of the United States, have invented a new and useful Improvement in Gates for Swing-Bridges, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is an end elevation showing the gates closed; Fig. 2, a top or plan view of the mechanism for closing the gates, with the gate-shafts in section; Fig. 3, a sectional elevation of the gate-operating mechanism, showing the approach, road-bed, and end of the bridge in section; Fig. 4, a detail showing the segmental gear for throwing the gates.

This invention relates to mechanism for operating the gates of swing-bridges automatically by the opening and closing of the bridge, and have the opening of the bridge close the gates and the closing of the bridge open them, and has for its objects to improve the construction and operation of the devices for operating the gates automatically from the swing of the bridge, as hereinafter more specifically described; and its nature consists in the several parts and combinations of parts hereinafter described, and pointed out in the claims as new.

In the drawings, A represents a bar connected at its outer end by a suitable pivot, *a*, to the side wall of the abutment or approach.

B is a bar corresponding to the bar A, and attached by a suitable pivot, *b*, to the other side wall of the abutment or approach.

C is a link connected at one end to the inner end of the bar B by a suitable pivot, *c*.

D is a link corresponding to the link C, and secured at one end to the inner end of the bar A by a suitable pivot, *d*.

E is a sliding bar, to the forward end of which are connected the ends of the links C D by a suitable pin or pivot, *c'*, and the under face of this bar E near its rear end is provided with a rack, *e*.

F is a gear-wheel, the teeth *f* of which mesh with the rack *e*, so that the movement of the sliding bar E will operate the wheel F.

G is a shaft on which is mounted the gear-wheel E, so that the movement of the wheel will be communicated to the shaft. This shaft G is located on one side of the sliding bar, and on the opposite side is a shaft, G', which is connected with the gear-wheel by a clutch, so that the shaft G' can be operated independent of or from the gear-wheel F.

H H' are vertical shafts, one for each side of the mechanism. The shaft H is connected with and operated from the shaft G by beveled gears *g h*, and the shaft H' is connected with and operated from the shaft G' by beveled gears *g' h'*.

I I' are the gates for the roadway, one of which, I, is attached to the vertical shaft H, and the other, I', to the vertical shaft H'.

J is a vertical shaft adjacent to the vertical shaft H, and carrying a gate, J'', for the sidewalk portion of the approach on one side. This shaft J at its lower end is stepped or otherwise pivotally supported, and at its upper end is a cogged segment, *j*, which meshes with a cogged segment, *i*. A corresponding vertical post, J', is located adjacent to the vertical shaft H', and carries the gate J'' for the other sidewalk, and this shaft is connected with the shaft H' by cogged segments *i j*.

K is a sliding clutch, one portion of which is rigidly connected with the wheel F, and the other portion, *k'*, slides upon the shaft G', and this sliding portion is held in engagement with the stationary portion by a coiled spring, *k''*, around the shaft G'.

L is an L-shaped lever, the longer arm of which has a fork, *l*, which enters a groove in the sliding portion *k'* of the clutch K, and this lever is attached by a pin or pivot, *l'*, to an arm or bracket, L', extending out from the frame-work which supports the mechanism, as shown in Fig. 2.

M is a link connecting the bell-crank lever with its operating-arm.

N is the operating arm or rod for the lever L, attached at one end to a bracket or ear, *m*, and having its free end turned at right angles and projected through the front of the abutment or approach, and provided with a head, *n*, as shown in Figs. 2 and 3.

O is an arm, having an end, *o*, to engage with the head *n* of the arm or lever N. This

arm O is pivoted to a bracket or ear, *p*, on the bridge end, as shown in Fig. 3, so as to have its end *o* in line with the head *n*.

P is a rod connected at its outer end with the upper end of the arm or lever O, and extending along the bridge to the center, where its inner end is to be connected to a lever, (not shown,) by which the bridge-tender can move the rod P to throw the lever O and cause its end *o* to strike the head *n* and move the arm or lever N for the link M to throw the elbow-lever L to disengage the sliding portion *k'* from the stationary portion *k* of the clutch K.

Q represents standards or uprights for supporting the mechanism.

R is a cross-bar secured to the uprights Q, and having at the center ears *r*, between which is located the wheel F, and the shafts G G' are supported in bearings formed by the ears *r* and upper portion, *q*, of the uprights Q.

S represents cross-pieces on top of the standards Q, and each having an edge or flange, *s*, through a slot in which the sliding bar E passes, so as to be free to advance and recede in use. The under face of the bar E at each end rests upon the cross bars or plates S, and this bar is maintained in a straight line of travel by the slots in the flanges *s*.

T are weights, one connected by a rope or chain, *t*, to the clutch K in the arrangement shown, and the other similarly connected to the shaft G, so that the gates can be closed, or only the gates on one side.

U is the opening formed in the abutment or approach between the side walls, U', front walls, U'', and rear walls, U³.

V represents the road-bed and sidewalks over which the gates are to swing to close the approach.

W is the bridge, only the end of which is shown, as the bridge itself as a whole is to be of any of the usual and well-known forms of construction of swing or pivot bridges.

The operation is as follows: In Figs. 1 and 2 the parts are shown in the position they occupy when the bridge is open and the gates are closed, and, as shown in Fig. 3, the parts are in the position they occupy when the bridge is closed and the gates are open. The end of the bridge, when closing, will strike against the bar A or the bar B, accordingly as the bridge is turned in closing, and this contact of the end of the bridge with either the bar A or the bar B carries the inner end of such bar toward the approach, which, through the links C or D, moves the sliding bar E inward or toward the approach, causing the rack *e* to act on the wheel F and turn the shafts G G', the shaft G' turning from the engagement of the clutch K, and this turning of the shafts G G' turns the beveled gears *g g'* and imparts rotation to the beveled gears *h h'*, turning the respective shafts H H' and throwing the gates I I' parallel with the roadway, and at the same time the turning of the vertical shafts H H' through the segmental gears *i j* turns the shafts J J', throwing the gates J'' parallel with the sidewalks on each side, as shown in Fig. 1, thus leaving the roadways and sidewalks of the approach clear for travel. The turning of the shaft G in the construction shown winds the rope *t* on the shaft G and clutch K and raises the weights T, and these weights will remain suspended as long as the end of the bridge is in contact with the bars A B, or either of them, as such contact maintains the sliding bar E in its advanced position, and through the rack *e* holds the wheel F stationary, and when the parts are in this position the approach-gates will all be open, and as the end of the bridge in swinging is withdrawn from contact with the bars A B the weights T, which have been held suspended, are free to drop, and this dropping of the weights unwinds the ropes *t* and imparts rotation to the shafts G G', which is communicated to the vertical shafts H H' through the respective gears *g h g' h'*, turning such shafts and throwing the gates I I' across the roadway, as shown in Fig. 1, and at the same time the turning of the shafts H H' through the segmental gears *i j* turns the vertical shafts J J' and throws the gates J'' across the sidewalk on each side, closing the approach effectually, and the gates thus closed will so remain until the bridge is again swung around so as to be closed, and its end brought in contact with either bar A B to advance the sliding bar E and open the gates, as already described.

The gates for the right-hand side of the roadway and sidewalk on each side or end of the bridge can be closed in the construction shown, while the bridge is still closed by the bridge-tender moving the rod P to bring the end *o* of the arm O into engagement with the head *n* to throw the arm or lever N inward, which turns the elbow-lever L to disengage the sliding portion *k'* of the clutch, which disengagement leaves the clutch-weight T free to drop and turn the shaft G', and, through the gears *g' h'*, turn the shaft H' to throw the gate I' across the roadway on that side, and at the same time the segmental gears *i j* turn the vertical shaft J' to close the gate J''. This setting of one gate across the roadway independent of the other will not interfere with the setting of the other gate from the movement of the bridge in opening, as when opened the pressure on the bars A B is released, leaving the shaft G free to be turned by the action of its weight T thereon to turn the vertical shaft H, as already described.

The mechanism for closing the gates and the abutment are only shown for one end or side; but the other end or side is to be provided with duplicate mechanism of that shown and operating in the same manner. A single weight, T, will be all that is required when it is not desired to close one of the gates before the bridge is opened.

What I claim as new, and desire to secure by Letters Patent, is—

1. The pivoted arms or bars A B and links

C D, in combination with the sliding bar E, carrying a rack, *e*, for operating the shafts to open and close a series of gates for a bridge-approach, substantially as specified.

2. The arms or bars A B, links C D, sliding bar E, carrying a rack, *e*, and gear-wheel F, in combination with the horizontal shaft and a vertical shaft for operating the gate of a bridge-approach, substantially as specified.

3. The arms or bars A B, links C D, sliding bar E, carrying the rack *e*, and gear-wheel F, in combination with a horizontal shaft and vertical shaft operated by gear-connection from the horizontal shaft, and carrying gates for closing the roadway of a bridge-approach, substantially as specified.

4. The bars A B, links C D, sliding bar E, carrying the rack *e*, and gear-wheel F, in combination with a horizontal shaft, G, beveled gear *g*, vertical shaft H, beveled gear *h*, vertical shaft J, segmental gear *i j*, and gates I′ and J″, for operating both gates simultaneously, substantially as specified.

5. The approach-gates I, I′, and J″, vertical shafts J J′ and H H′, and segmental gear *i j*, in combination with the shaft G G′, gears *g h* and *g′ h′*, wheel F, sliding rack-bar E, links C D, and bars A B, for operating all of the gates simultaneously and automatically from the movement of the bridge, substantially as specified.

6. The shaft G′, gears *g′ h′*, and shaft H′, carrying a gate, I′, in combination with the clutch K, elbow-lever L, link M, lever N, arm O, rod P, and weight T, for closing one of the approach-gates for the roadway independent of the other, substantially as specified.

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