

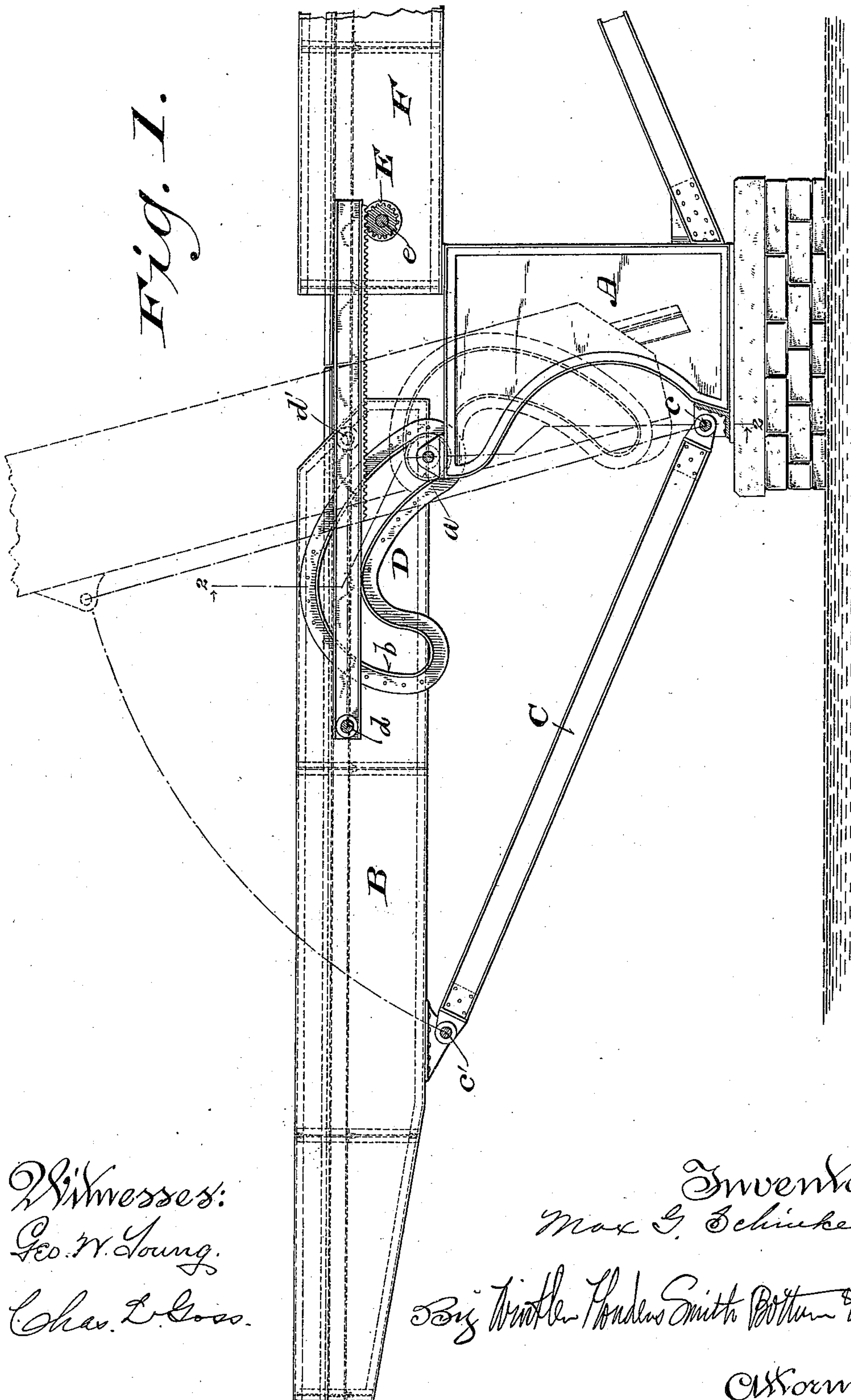
(No Model.)

2 Sheets—Sheet 1.

M. G. SCHINKE.
DRAWBRIDGE.

No. 551,004.

Patented Dec. 10, 1895.



Witnesses:
Geo. W. Young.
Chas. L. Goss.

Inventor:
Max G. Schinke,
By Wm. Pender Smith Attorney
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(No Model.)

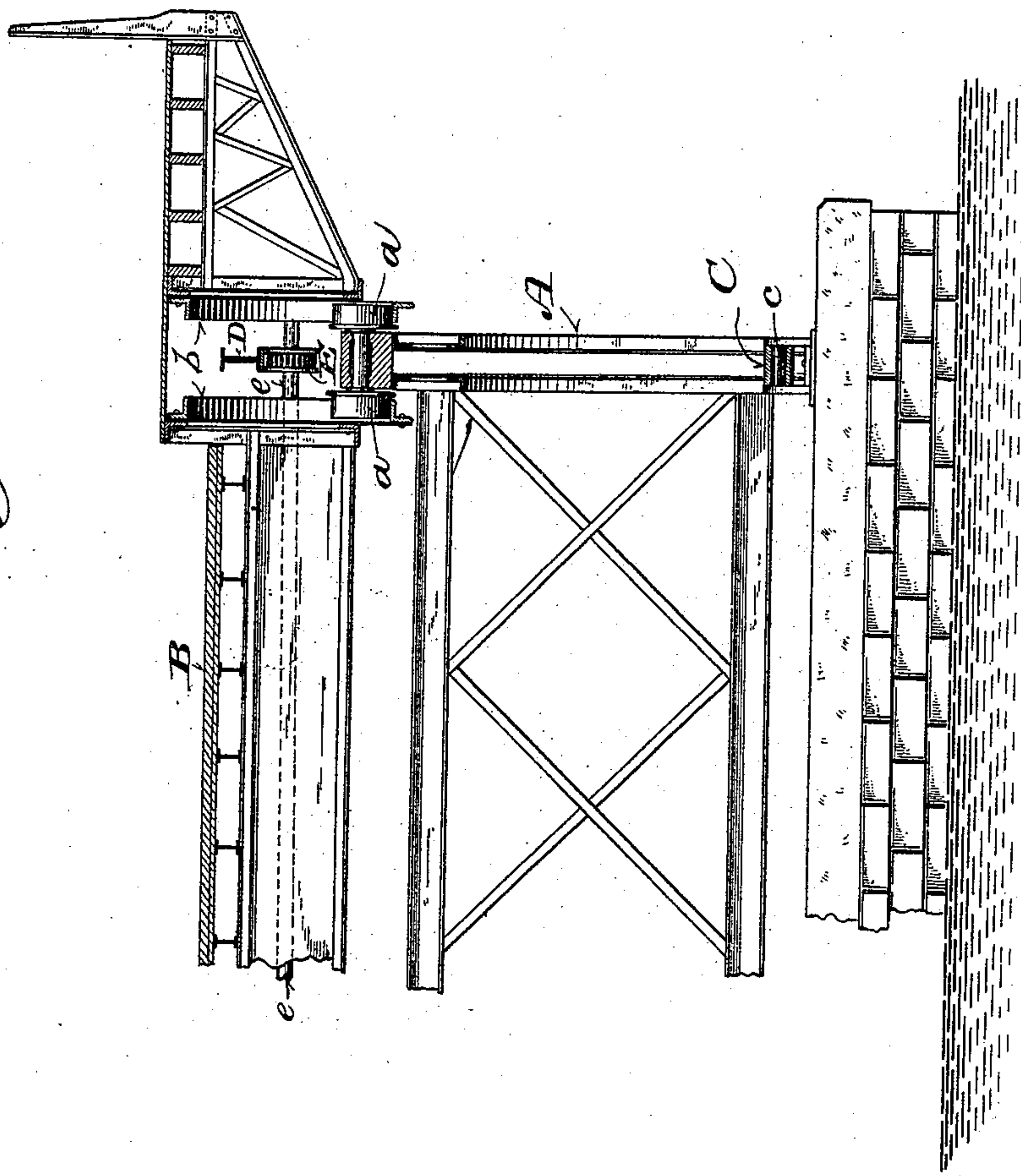
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Fig. 2.



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UNITED STATES PATENT OFFICE.

MAX G. SCHINKE, OF MILWAUKEE, WISCONSIN.

DRAWBRIDGE.

SPECIFICATION forming part of Letters Patent No. 551,004, dated December 10, 1895.

Application filed March 8, 1895. Serial No. 540,999. (No model.)

To all whom it may concern:

Be it known that I, MAX G. SCHINKE, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Draw-bridges; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to vertically-swinging bridges or those that turn on horizontal axes.

The main objects of my invention are to dispense with a middle pier and thus afford a clear channel or passage between opposite abutments or supports, to close the approach to the bridge when it is open, and, generally, to improve the construction and facilitate the operation of bridges of this class.

It consists essentially of certain novel features in the construction and arrangement of the bridge supporting, swinging, guiding, and operating connections hereinafter particularly described, and pointed out in the claims.

In the accompanying drawings like letters designate the same parts in both figures.

Figure 1 is a partial side elevation and vertical longitudinal section of a bridge embodying my invention; and Fig. 2 is a vertical cross-section of a portion thereof on the line 2 2, Fig. 1.

A designates a supporting structure, which may be made of iron, as shown, or of other suitable material, and is located at one side of the channel or passage to be spanned by the bridge. It is provided with two or more vertically-arranged rollers *a*.

B designates a vertically-swinging bridge-section, which is provided, preferably at or near the sides, with longitudinally-arranged parallel guides *b b*, adapted to bear upon the rollers *a* and thus support and guide the abutment or inner end of the swinging bridge-section in opening and closing the same.

C designates a brace or link pivoted at one end to the supporting structure A or any other suitable fixed support at *c* and at the other

end to the swinging bridge-section at *c'*, so as to support its overhanging or outer end outside of the guide *b*. There are preferably two or more of these braces or links, one at least at or near each side of the bridge, and they may all be rigidly connected by cross-bracing or in any other suitable manner.

It will be observed that in opening and closing the bridge the pivot connection *c'* of the brace or link C moves in the arc of a circle, as indicated by a dotted line in Fig. 1, and that the rollers *a* and guides *b* are constructed and arranged after the mathematical rule that in opening and closing, a certain assumed point, as *d*, of the swinging bridge-section will move in a certain assumed line *d d'*, the point *d* being preferably located at or near the center of gravity of the swinging bridge-section and the line of travel *d d'* being preferably horizontal to avoid lifting in swinging the movable section B. It will furthermore be observed that in consequence of this mathematical rule the shape and location of the curved guides and rollers are dependent upon the location of the point *d* with reference to the brace or link C and upon the line *d d'*, which said point traverses. In the case represented by the drawings the point *d* is located between the pivot connection *c'* and the guides *b*. It may, however, be located on the opposite side of said pivot connection. Under certain conditions it may be desirable to connect the brace or link C with the supporting structure above the roadway. In either of these cases the guides and rollers are to be correspondingly shaped and located to meet the above-mentioned mathematical rule for their construction. The line of travel *d d'* is shown straight. It may be somewhat curved.

In the drawings the rollers *a* are shown circular and concentrically mounted; but the same result may be attained by making the rollers concentric or of non-circular periphery and the guides less curved or straight, or nearly so.

Various devices or forms of mechanism may be employed for operating the bridge. I have shown as suitable for the purpose a rack-bar D, pivotally connected with the swinging bridge-section at *d*, and a gear or pinion E, engaging therewith and mounted

on a horizontal shaft *e*, which has bearings in the supporting structure of the bridge or the approach *F* thereto. Any suitable power may be applied to turn the shaft *e* in any well-known and convenient manner. Power might be applied to the rollers *a* for opening and closing the bridge, or in place of the rack-bar *D* a screw or cylinder and piston might be employed. In short, various changes in the details of the bridge and its connections may be made within the scope and spirit of my invention.

I claim—

1. The combination of a suitable abutment or support provided with rollers, a vertically swinging bridge section provided with guides bearing against and adapted to traverse said rollers, and one or more links or braces pivoted to said bridge section and to a suitable support, substantially as and for the purposes set forth.

2. The combination with a suitable abutment or support provided with vertically arranged rollers, of a vertically swinging bridge section provided with longitudinally arranged parallel guides carried by said rollers and adapted to produce a curved movement of the adjacent end of said bridge section in opening and closing it, and a brace or links pivoted at or near one end to a fixed support and at or near the opposite end to said bridge section, substantially as and for the purposes set forth.

3. The combination with a suitable support, of a vertically swinging bridge section, a brace or links pivoted to said support and having pivot connections with said bridge section which move in the arc of a circle in open-

ing and closing the bridge, rollers mounted on the fixed support and guides applied to the movable bridge section and adapted to traverse said rollers, said rollers and guides being constructed and arranged to cause an assumed point in said bridge section outside of its supporting points to traverse a given line, substantially as and for the purposes set forth.

4. The combination with a suitable support provided with rollers, of a vertically swinging bridge section provided with longitudinally arranged curved guides carried by said rollers, and a brace or links having pivot connections with a fixed support and with said bridge section, substantially as and for the purposes set forth.

5. The combination with a suitable support provided with vertically arranged rollers, of a vertically swinging bridge section provided with longitudinally arranged and vertically curved parallel guides adapted to traverse said rollers, and a brace or links having pivot connections with said bridge and with a suitable fixed support whereby an assumed point in said movable bridge section at a distance from its supporting connections is caused to travel in an assumed line in opening and closing the bridge, substantially as and for the purposes set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

MAX G. SCHINKE.

Witnesses:

JOHN H. HURLEY,
CHAS. L. GOSS.