

No. 621,466.

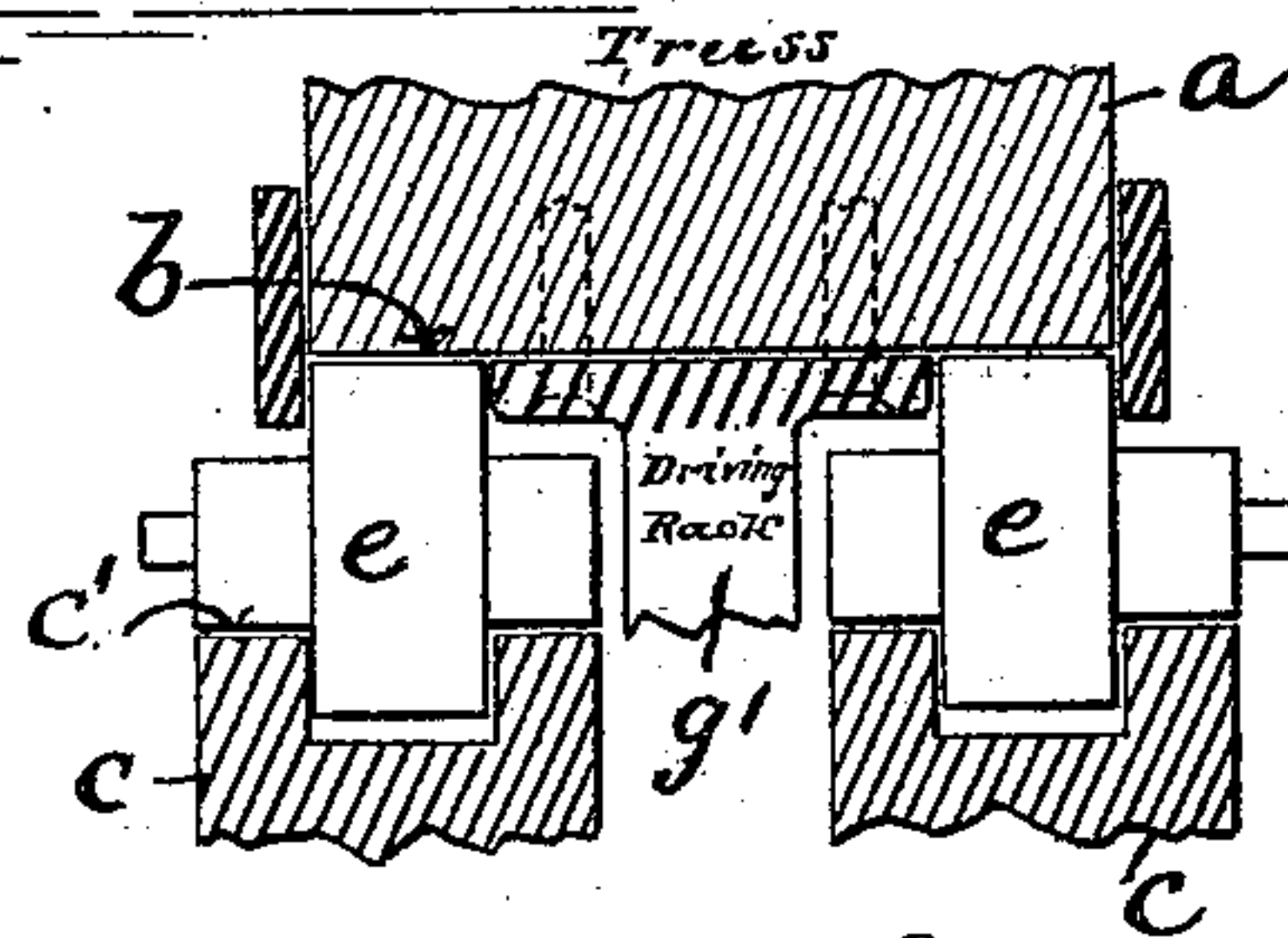
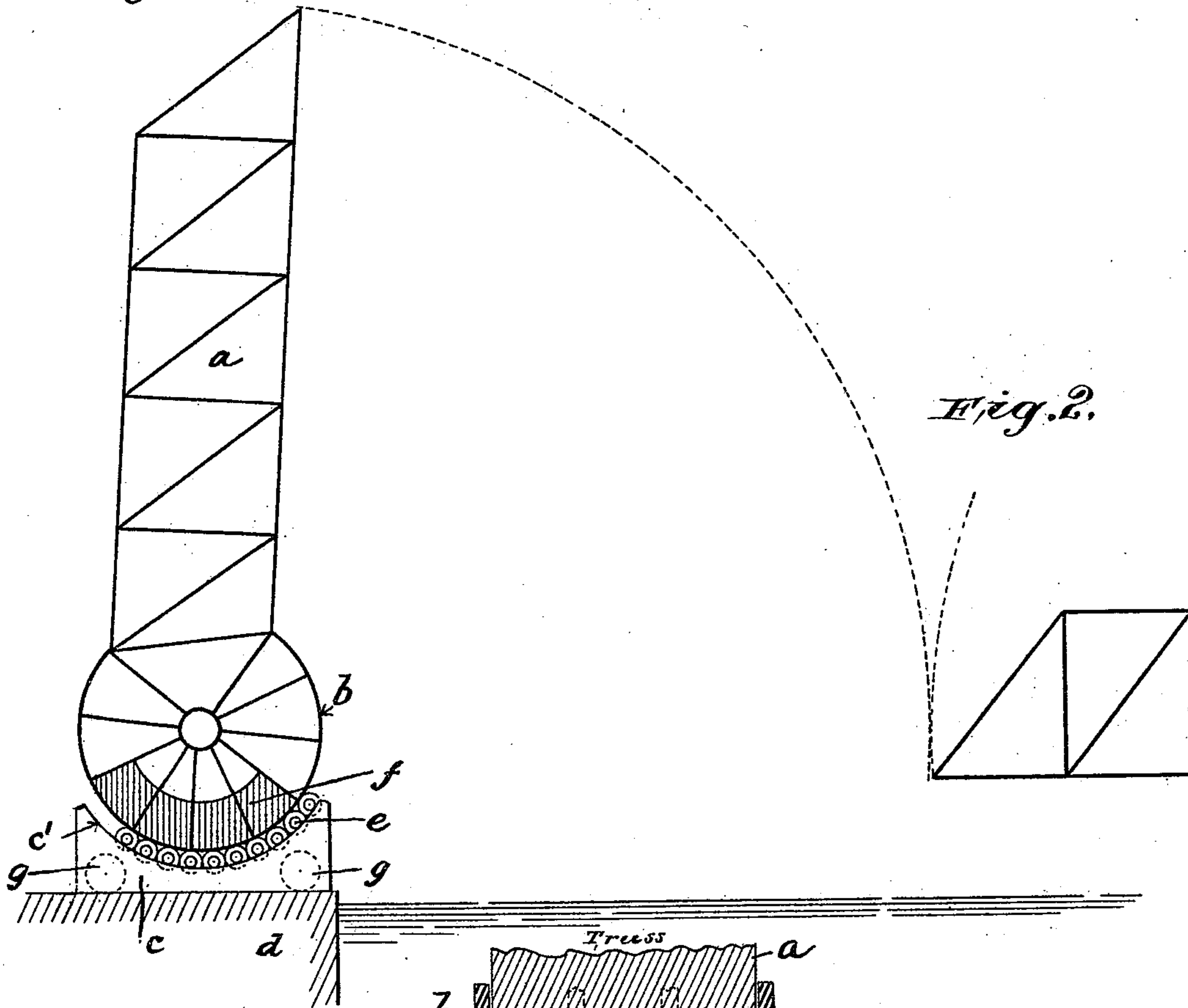
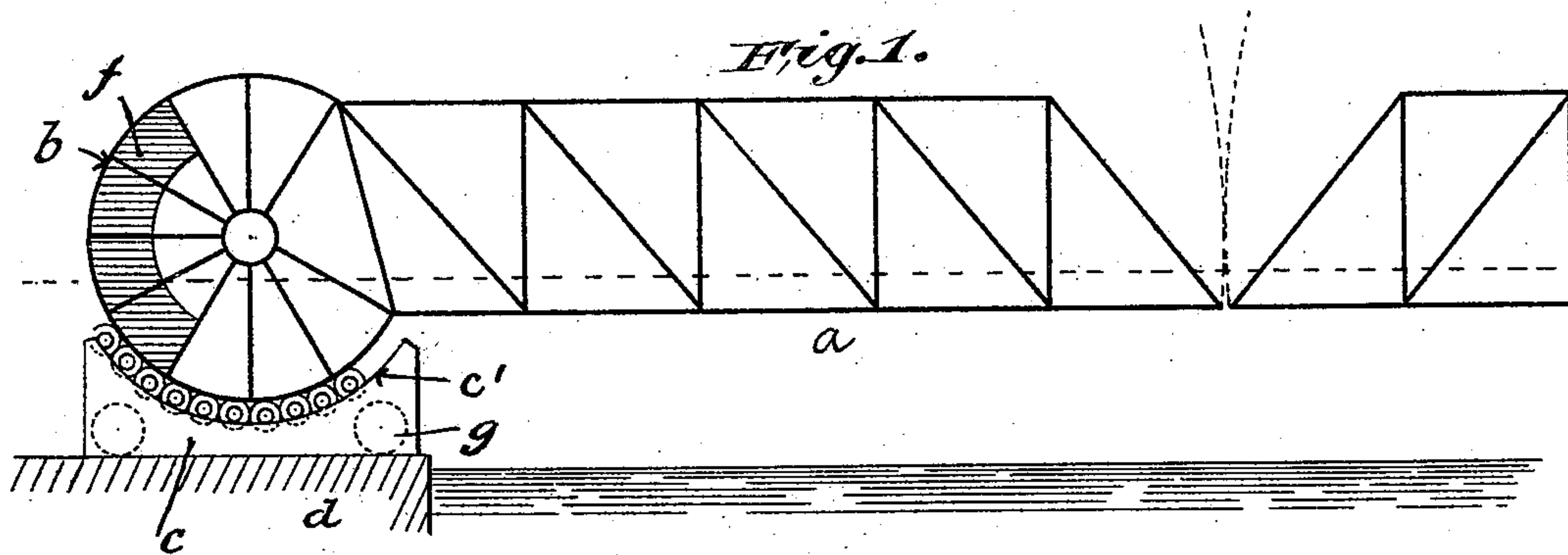
Patented Mar. 21, 1899.

M. WADDELL.

BRIDGE.

(Application filed Jan. 20, 1899.)

(No Model.)



WITNESSES

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# UNITED STATES PATENT OFFICE.

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## BRIDGE.

SPECIFICATION forming part of Letters Patent No. 621,466, dated March 21, 1899.

Application filed January 20, 1899. Serial No. 702,774. (No model.)

*To all whom it may concern:*

Be it known that I, MONTGOMERY WADDELL, a subject of the Queen of Great Britain, residing at the city of New York, in the borough of Manhattan and State of New York, have invented certain new and useful Improvements in Bridges, of which the following is a full, clear, and exact description.

This invention relates to swinging lift-bridges, and has for its objects to provide a construction which shall be economical to build, which can be operated with facility, and which shall require a comparatively narrow and inexpensive substructure, the whole bridge, in fact, being considerably narrowed. In carrying out these objects my improved bridge is constructed with an arc-shaped track bounding or adjacent to its pivotal end, which track rests upon or in a suitable cradle having a correspondingly-shaped track engaging the first and in which the first turns, the axis of rotation of the lifting-span being fixed.

The invention will be described in detail with reference to the accompanying drawings, in which—

Figure 1 is a conventional side elevation of one span of the bridge and a portion of another constructed according to my invention. Fig. 2 is a similar view showing a single span lifted; and Fig. 3 is a detail in cross-section, illustrating one construction of the tracks.

The lifting-span of the bridge is indicated by *a*. It will be understood to consist of a truss or trusses put together in accordance with best engineering practices and affording a passage-way through or upon it. The span is mounted to turn upon a horizontal axis, the pivotal end being bounded by an arc-shaped track or bearing-face *b*, embracing the end structure of the span. The span may have two or more of these tracks, which will be preferably arranged on each side of the passage-way and in the same planes as the side trusses of the span. The end of the span, instead of being hung upon a shaft or upon trunnions, will rest in a cradle *c*, constructed upon or forming part of the substructure or pier *d*. This cradle is provided with arc-shaped tracks or bearing-faces *c'*, with which the tracks or faces *b* on the span engage, all tracks being substantially concentric with the

axis of rotation of the span. It will be observed that by this construction it becomes possible to make the substructure, including the cradle, of substantially the same width as the bridge-span, and thereby economize considerably in space. The engaging faces of the tracks may slide upon each other; but I prefer to interpose sets of antifriction-rollers *e* and to construct these with two diameters, the greater bearing upon the track on the span and the lesser bearing upon the track on the cradle. By this means the travel of the set of rollers along the cradle when the bridge-span is moved is short.

The bridge-span will preferably be counterweighted by a mass *f*, carried by the span on the land side of the axis. The location of this counterweight may be inside of the arc-shaped tracks or outside thereof, as circumstances may direct; but its weight should be such as to substantially balance the span in any position, thus entailing upon the motive devices only such work as is necessary to overcome friction and inertia. The engine or motor is indicated at *g*. It is supposed to engage an arc-shaped rack *g'*, attached to the truss, a convenient construction being that shown in Fig. 3, where the rack occupies an intermediate position between two sets of rollers engaging with a single track; but my invention is not confined to this construction nor to this method of applying the power for moving the span.

Various other forms of supporting devices for the span may be used. The cradle is preferable, but it may be substituted by a set of fixed rollers suitably mounted on the pier and arranged in the arc of a circle, and the number of rollers may even be reduced to two, set apart sufficiently to receive and sustain the end of the span between them.

Having described my invention, I claim—

1. In a swinging lift-bridge, the combination of the lifting-span having its pivotal end bounded by an arc-shaped track or face concentric with the axis of the span, said track or face being of large diameter as distinguished from an ordinary trunnion, and a cradle provided with a concentric arc-shaped track or face in which the pivotal end of the span rests and turns, substantially as described.



2. In a swinging lift-bridge, the combination of the lifting-span having its pivotal end bounded by an arc-shaped track or face concentric with the axis of the span, said track  
5 or face having a diameter not less than the mean height of the span, and a cradle provided with a concentric arc-shaped track or face in which the pivotal end of the span rests and turns, substantially as described.

10 3. In a swinging lift-bridge, the combination of a counterweighted lifting-span having its pivotal end bounded by an arc-shaped track or face concentric with the axis of the span, and a cradle provided with a concentric  
15 arc-shaped track or face in which the pivotal end of the span rests and turns, said cradle supporting the weight of the span and its counterweight, substantially as described.

20 4. In a swinging lift-bridge, the combination of a counterweighted lifting-span having its pivotal end bounded by an arc-shaped track or face concentric with the axis of the span and having its counterweight located between said axis and the arc-shaped track,  
25 and a cradle provided with a concentric arc-shaped track or face in which the pivotal end of the span rests and turns, substantially as described.

5. In a swinging lift-bridge, the combination of the lifting-span having its pivotal end  
30 bounded by an arc-shaped track or face concentric with the axis of the span, a cradle provided with a corresponding arc-shaped track or face in which the pivotal end of the span rests and turns, and a set of antifriction-rollers interposed between the two tracks  
35 or faces, substantially as described.

6. In a swinging lift-bridge, the combination of the lifting-span having its pivotal end  
40 bounded by an arc-shaped track or face concentric with the axis of the span, a cradle provided with a corresponding arc-shaped track or face in which the pivotal end of the span rests and turns, and a series of antifriction-rollers interposed between the two  
45 tracks or faces, said rollers having two diameters, one of which engages with the track on the span while the other engages with the track on the cradle, substantially as described.  
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In witness whereof I subscribe my signature in presence of two witnesses.

MONTGOMERY WADDELL.

Witnesses:

WM. A. ROSENBAUM,  
FRANK S. OBER.