H. A. F. ABT.

BASCULE BRIDGE.

APPLICATION FILED FEB. 14, 1921.

1,412,328. **Patented Apr. 11, 1922.**

FIG. 1

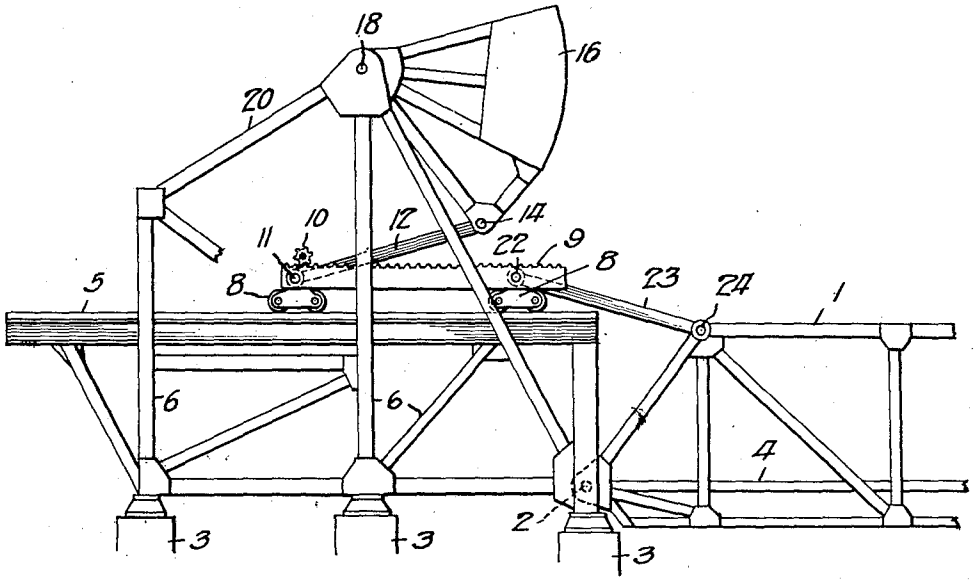
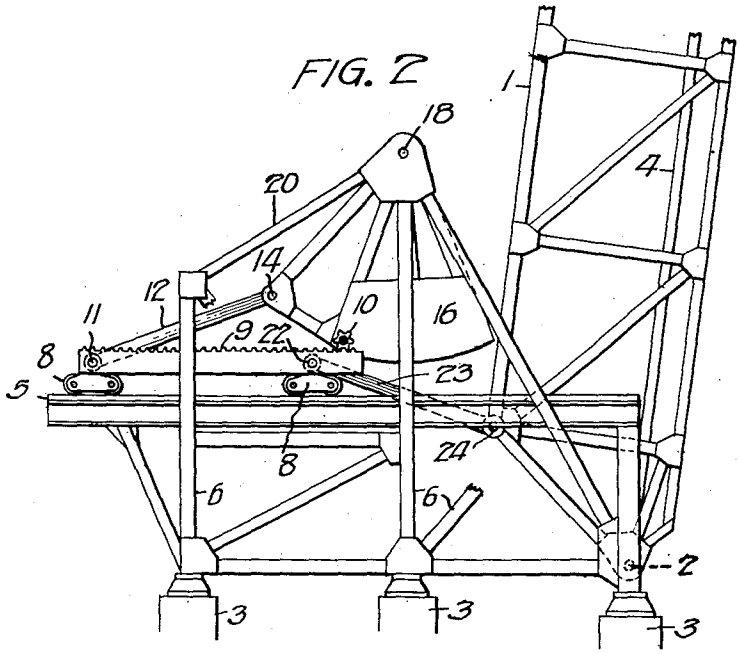


FIG. 2



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BASCULE BRIDGE.

1,412,328. Specification of Letters Patent. Patented Apr. 11, 1922.

Application filed February 14, 1921. Serial No. 444,809.

To all whom it may concern:

Be it known that I, HUGO A. F. ABT, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Bascule Bridges, of which the following is a specification.

My invention relates to bascule bridges, and the object is to provide a bridge in which the operating mechanism may be located overhead and so arranged that the structure can be erected without obstructing traffic. Another object is to provide a construction in which the counterbalancing effect of the counterweight will be uniform at all times and in all positions of the bridge leaf. Still another object is to provide a construction by which the counterweight may be mounted farther back on the abutment—that is, away from the bridge leaf. In carrying out my invention I provide an overhead track on which there is a traveling carriage connected by links to the bridge leaf and counterweight. In the preferred construction the links are substantially of equal lengths and always maintain substantially the same angular relation to the line of travel of the carriage. Other contributory objects will appear as the description proceeds.

I obtain my objects by the construction illustrated in the accompanying drawings in which—

Figure 1 is a side elevation of a bridge embodying the invention, the bridge leaf being shown in lowered position.

Figure 2 is similar to Figure 1 but shows the bridge leaf elevated.

Like numerals denote like parts in both views.

The bridge leaf indicated in general by the reference numeral 1 is supported upon a stationary pivot 2 carried by foundations 3 of any suitable design. In the construction illustrated the floor 4 of the bridge is approximately on a level with the supporting pivot 2. An overhead track 5 is mounted upon a framework 6 at an elevation high enough to clear the tops of vehicles traveling upon the floor of the bridge and its approaches. Adapted to travel upon this track is a carriage which may vary somewhat, structurally, but which in the present case is of considerable length and provided with two trucks 8, 8 located at opposite ends of the carriage and adapted to travel back and forth upon the track. Mounted upon these trucks is a rack 9 adapted to mesh with a stationary pinion 10 driven by an electric motor or other suitable form of power device. It will be evident that by rotating the pinion in the proper direction the carriage will be caused to travel forward or backward along the track. At one end of the carriage a pivot pin 11 forms a point of connection for a link 12, the other end of which is connected by a pivot pin 14 to the counterweight 16. Said counterweight is pivotally mounted upon a pin 18 carried by a superstructure 20 which rises considerably above the level of track 5. The other end of the carriage is connected by a pin 22 and link 23 to a pin 24 mounted at the top of the bridge leaf frame. In the best design the links 12 and 23 are of equal length and the pivot pin 18 is as high above the horizontal plane passing through the pivots 11, 22 as the pivot pin 2 is below said plane. Furthermore, the distance between the pivot pins 14, 18 is the same as the distance between the pins 2, 24. Furthermore, the parts are so arranged that the links 12, 23 always lie at equal angles to a horizontal plane passing through the pivot pins 11, 22. The result is that the bridge leaf will at all times be uniformly counterbalanced, that is, the counterbalancing effect will be uniform throughout all angular positions of the bridge leaf.

It is also true that the racks 9 constitute links connecting the free ends of the links 12, 23. One of the advantages of these rack links 9 is that they make it possible to place the counterweight farther back on the abutment away from the draw. It will be evident that if the free end of the link 12 were connected directly to the free end of the link 23 it would be necessary to place the counterweight nearer the draw, as is the case with my copending application, Serial No. 402,837.

In operation, when the pinion 10 is rotated, it will cause the rack 9 and the carriage of which it is a part, to travel backward or forward upon track 5, depending upon the direction of rotation of the pinion. If the pinion rotates in a direction to move the rack toward the left, Figure 1, the bridge leaf will be raised and the counterweight will be correspondingly lowered. In view of the various proportions and relative locations of the parts, as described, the angular relation of the links to the line of travel of the carriage will always remain equal and hence the effect of the counterbalance will be

the same for all positions of the bridge leaf. In view of the fact that the track 5 and parts supported thereon are overhead, the structure can be completely erected without interrupting traffic in those cases where a bridge of my construction is to replace a former structure, especially of the swing bridge type. It will be understood that this is of great advantage, especially in railways where the obstruction of traffic is always a serious matter.

It will be understood that the bridge leaf will be constructed usually in upright or open position so as not to obstruct the water borne traffic. One of the characteristics of my bridge is that the counterweight hangs straight downward when the bridge leaf is raised, and the result is that the counterweight shell or receptacle which contains the concrete can be filled with concrete at this time, and no scaffolding or false work is necessary; in other words, the shell of the counterweight hangs pendant during the period of construction and hence can be filled in its natural position and no false work or scaffolding is necessary for holding it in raised position and special expedients are required for holding the concrete in place while it is being poured.

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

1. A bascule bridge having a bridge leaf and a counterweight rotatable about parallel axes, a first link for operating the bridge leaf, a second link for operating the counterweight, a third link connected at its ends to the free ends of the first and second link, means for guiding the third link, and means for causing it to travel.

2. A bascule bridge having a bridge leaf and a counterweight rotatable about parallel axes, an elongated member constituting a link disposed horizontally and adapted to travel horizontally, a link connecting the bridge leaf with the end of the elongated member which is nearest the draw, and a link connecting the counterweight with the end of the elongated member which is farthest away from the draw.

3. A bascule bridge having a bridge leaf and a counterweight rotatable about parallel axes, an elongated member constituting a link disposed horizontally and adapted to travel horizontally, a link connecting the bridge leaf with the end of the elongated member which is nearest the draw, a link connecting the counterweight with the end of the elongated member which is farthest away from the draw, the elongated member being in the form of a rack, and a drive pinion engaging said rack for actuating the operating parts.

4. A bascule bridge having a bridge leaf and a counterweight rotatable about parallel axes, an elongated carriage adapted to travel back and forth in a horizontal direction, a link connecting the other end of the carriage with the bridge leaf and another link connecting the inner end of the carriage with the counterweight, the links being of equal length and being attached to their respective parts at equal distances from the pivots thereof.

5. A bascule bridge having a bridge leaf and a counterweight rotatable about parallel axes, a horizontal track, a carriage adapted to travel back and forth on said track, said carriage being elongated and having a rack arranged lengthwise of it, a stationary pinion adapted to engage said rack to cause the carriage to travel back and forth along the track, a tension link connecting the bridge leaf to one end of the carriage, and a compression link connecting the counterweight to the other end of the carriage.

6. A bascule bridge having a pivotally supported bridge leaf, an overhead horizontal track, a counterweight pivotally supported about an axis parallel to the axis of the bridge leaf, the axis of the counterweight being located above the track, a carriage adapted to travel along said track, a rack supported by said carriage lengthwise of the track, a stationary pinion adapted to mesh with said rack to actuate the carriage, a tension link connecting the bridge leaf to one end of said rack, and a compression link connecting the counterweight to the other end of said rack.

In witness whereof, I have hereunto subscribed my name.

HUGO A. F. ABT.