June 23, 1925. 1,542,972

J. B. STRAUSS

BASCULE BRIDGE

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Fig 1

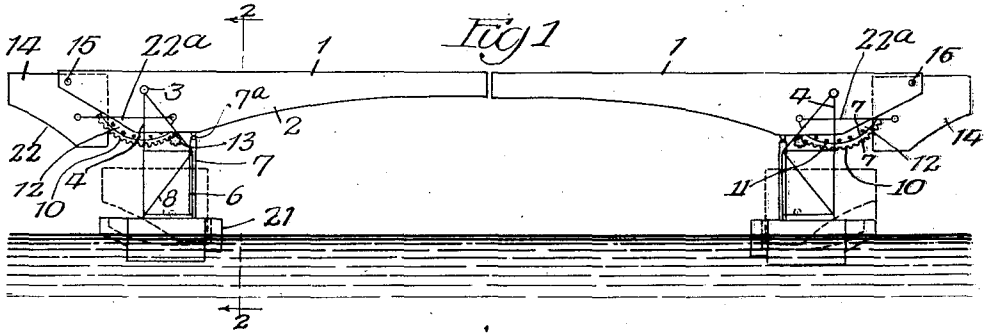


Fig 2

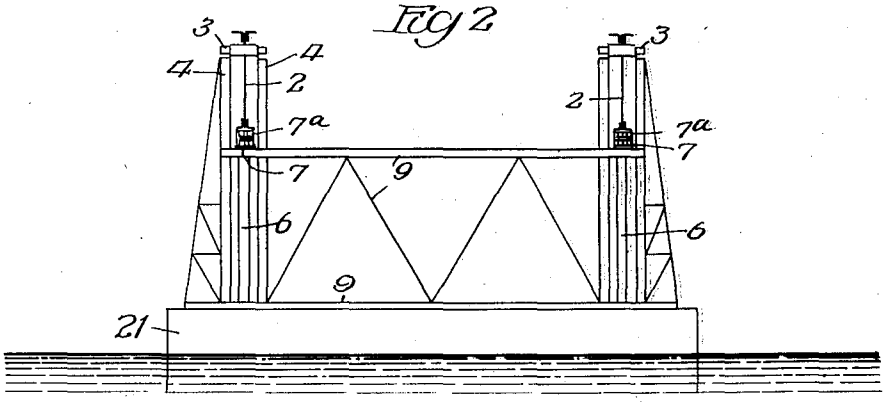


Fig. 3

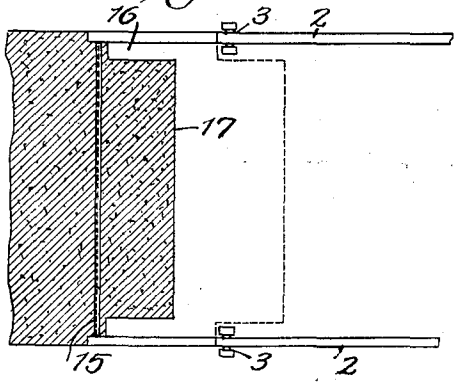


Fig. 4

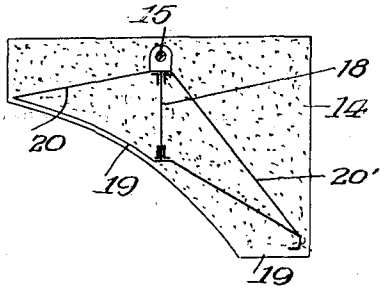


Fig. 5

Fig 6

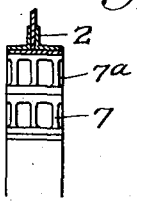
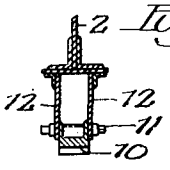


Fig. 7



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BASCULE BRIDGE

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Fig. 9

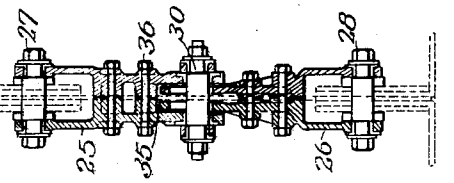


Fig. 10

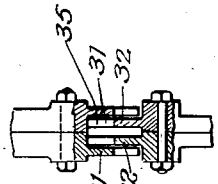
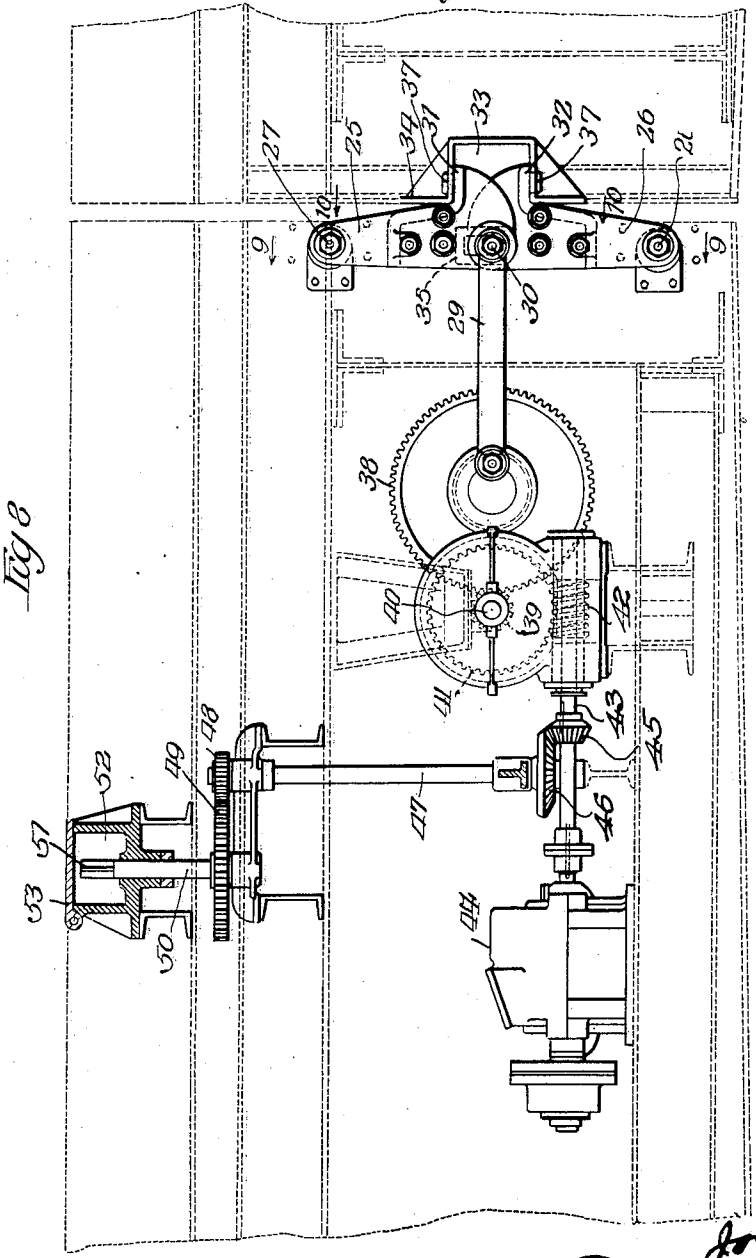


Fig. 8



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Patented June 23, 1925. 1,542,972

UNITED STATES PATENT OFFICE.

JOSEPH B. STRAUSS, OF CHICAGO, ILLINOIS.

BASCULE BRIDGE.

Application filed December 20, 1920. Serial No. 431,850.

To all whom it may concern:

Be it known that I, JOSEPH B. STRAUSS, 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.

This invention relates to bascule bridges and has for its object to provide a new and improved bridge of this description. The invention has among other objects to provide a combined trunnion support and live load support formed into a unitary structure wherein the stresses are confined and taken up. The invention has as a further object to provide an improved counterweight construction. The invention has as a further object an improved center lock for locking the adjacent ends of the two leaves of a bascule bridge together. The invention has other objects which are more particulary pointed out in the following description.

Referring now to the accompanying drawings—

Fig. 1 is a view showing a double leaf bascule bridge embodying the invention;

Fig. 2 is a sectional view taken on line 2—2 of Fig. 1;

Fig. 3 is a plan view of the rear end of one leaf showing the counterweight construction;

Fig. 4 is a cross section of the counterweight;

Fig. 5 is a side view of the live load supporting pieces;

Fig. 6 is a front view of the live load supporting pieces;

Fig. 7 is a sectional view through a portion of one of the main members of the leaf showing the detachable rack segment;

Fig. 8 is a side view showing the locking mechanism for the ends of the two leaves;

Fig. 9 is a sectional view taken on line 9—9 of Fig. 8;

Fig. 10 is a sectional view taken on line 10—10 of Fig. 8;

Like numerals refer to like parts throughout the several figures.

I have illustrated in the drawings a bascule bridge having two leaves 1. These leaves are similar. Each leaf is provided with the main members 2 which may be girders or trusses. In the ordinary bridge there will be two of these main members, one at each side. These main members carry the trunnions 3 upon which the leaf is supported. These trunnions are mounted in bearings on the posts or supports 4. The posts are shown as double posts and there is one double post on each side of the bridge, the main member 2 coming between the two members of the post as shown in Fig. 2. The trunnions are in vertical alignment with the trunnion posts. These trunnion posts are mounted upon a suitable support carried by the pin 21. In front of the trunnion posts are the posts 6, carrying the front live load supports 7. These supports 7 are in vertical alignment with the posts 6. There are two posts 6, and two live load supports 7, one at each side of the bridge. The posts 6 are tied to the trunnion post 4 on the same side by suitable bracing 8 and the trunnion and live load posts are tied together crosswise of the bridge by the bracing 9, thus forming a unitary frame. The leaf is provided with the engaging pieces 7^a which engage the live load supports 7, when the leaf is closed. When the leaf is open the parts 7 and 7^a are disengaged and the leaf is entirely supported on the trunnions. By this construction it will be seen that the live load posts 6 are tied back to and are braced by the trunnion posts 4, thus forming a unitary self-supporting stable frame, within which the stresses are absorbed so as to bring vertical reactions only on the pier. This frame also acts as the machinery support, making a unitary compact, complete fixed bridge part separate from the pier, which supports the moving bridge part and contains and comprises everything necessary to sustain and operate it. The main members 2 of the leaf are each provided with a detachable rack 10. This detachable rack is removably connected by bolts or other fastening devices 11 with the separated holding pieces 12, which are attached to the main member 2 (see Fig. 7), the rack preferably being inserted between these holding pieces. This rack may be made in one or more segments and can thus be made independently of the girder or main member 2 and connected to it afterward and also be easily removed and replaced when necessary.

This greatly simplifies and cheapens the manufacture.

The leaf is opened and closed by means of a pinion 13 which engages the rack 10 and which is operated from a suitable motor mounted on the frame which supports the leaf. A counterweight 14 is pivotally connected with the rear end of the leaf by means of counterweight trunnions 15. This counterweight is preferably of reinforced concrete and is cut away at 16 on both sides so that the portion 17 of the counterweight may project between the trunnion supports without striking them when the leaf is opened, the trunnion supports passing into the spaces 16 during the opening of the leaf. The counterweight is provided with a central metallic girder 18 with bottom transverse metallic members 19 which are connected by metallic straps 20 with the top flange of the girder 18. The counterweight may be connected to this girder by trunnions 15. The girder and straps and transverse members are embedded in the concrete, the girder preferably extending entirely across the counterweight between the main members 2 of the leaf, and spanning the space between the points of connection to the rear end of the leaf. I prefer to locate the live load posts 6 in a plane intermediate the sections or parts of the trunnion posts as shown in Fig. 2. The pier 21 is provided with a counterweight recess into which the lower portion of the counterweight is received. A portion of the counterweight is cut away at 22 so as to permit its ready entrance into the recess in the pier.

When a double leaf bridge is used it is necessary to provide a lock at the meeting ends of the two leaves so as to lock them in position when closed. I have illustrated a lock for this purpose, shown in detail in Figs. 8, 9 and 10. In this construction there is mounted upon one leaf 1 the two members 25 and 26 of the lock, the members 25 being pivoted at 27 and the member 26 being pivoted at 28. These members are moved about their pivots by the controlling member 29, said controlling member being connected with a pin 30 which passes through slots in the members. This permits the members 25 and 26 as they are moved to gradually move apart. The locking members 25 and 26 have the locking parts 31 and 32, which when said members are moved about their pivots to lock the leaves of the bridge together, project into a space or opening 33 in the other leaf. I prefer to provide a metal receiving member 34. In order to secure a compact construction I prefer to provide one of the locking members, as for example the member 25, with a recess into which fits the end of the locking parts of the other member. This is clearly shown in Fig. 9 wherein the member 25 has the recess 35 into which the end of the member 26 projects. I prefer to make these members in two sections, the sections being held together by the bolts 36. It will be seen by referring to Figs. 9 and 10, the locking part 31 has two members, one at the top and one at the bottom which engage the wall of the receiving member 34, and that the locking part 32 also has two members which engage the wall of the receiving part 34, these members being within the members of the locking part 31. I also prefer to provide the locking parts with lugs 37 which work in grooves in the receiving members 34. These lugs hold the leaves against lateral movement while the locking parts hold them against vertical movement. This construction therefore produces a lock rigid in both directions.

The controlling member 29 may be operated in any desired manner. As herein shown it is connected with the gear 38 which engages a pinion 39 on the shaft 40, driven from any suitable source of supply. As herein shown the shaft 40 is provided with a worm gear 41 which engages a worm 42 on the shaft 43 driven from the motor 44. I also prefer to provide hand operated means for this lock, and this hand operated mechanism, as shown in Fig. 8, consists of a beveled pinion 45 which engages a beveled gear 46 on a shaft 47. The shaft 47 has a pinion 48 which engages a gear 49 on shaft 50, said latter shaft having a squared or non-circular end 51, which projects into a cap-stand box 52 near the top of the roadway. This box is provided with a lid 53 preferably flush with the roadway and which when open gives access to the shaft 50. The lock may be operated by putting a wrench on the shaft 50 and turning it.

When it is desired to open the bridge the controlling member 29 is moved to the left (see Fig. 8) and this rocks the members 25 and 26 about their pivots, and moves the locking parts 31 and 32 out of the receiving member 34, thus releasing the leaves of the bridge.

When it is desired to lock the leaves together the member 29 is moved to the right. This moves the locking parts 31 and 32 into the receiving member 34 and tightly presses the faces of these locking parts against the walls of said receiving member so as to lock the parts in position. The worm holds the parts in their locking position. This holding of the parts can be done by any other desired mechanism. It will thus be seen that this lock engages the top and bottom of the receiving member equally and simultaneously and is therefore as tight at the top as at the bottom. It will further be seen that this device automatically takes care of any wear because if the engaging faces wear the member 29 will simply be moved a little further to the right and thus a

tight engaging contact will be at all times made between the locking parts and the receiving member 34. This device therefore forms an automatic, tight center lock, with a wedging action, which is small and compact, with short leverage and rigid in both directions so as to hold the leaf against movement either vertically or horizontally and which is also independent of the weight. This lock may be said to comprise a toggle with projecting lugs and means for operating this toggle to engage a receiving part for the projecting lugs, the lugs having a clamping action on the receiving part. It will be noted that since the locking members are pivoted or mounted at a distance from and at one side of the recess into which the locking parts are received the movement of these locking members causes the locking parts to move toward the engaging face of the receiving member instead of passing it, and this insures the contact of the locking parts with these engaging faces at all times even if the parts become worn, thus automatically taking up the wear.

Referring to the support for the leaf it will be seen that there is a pier and a support and a leaf, the leaf being movably mounted on the support, the support comprising a selfcontained structural steel frame intermediate the leaf and the pier the rear of this frame supporting the leaf when the leaf is opened and the front of the frame supporting the frame when the leaf is closed.

I claim:

1. In a bascule bridge, comprising two sections or leaves, a lock adapted to lock the leaves together where they meet at the center, said lock comprising a pivoted locking projecting part on one leaf a pivot fixed against lateral movement which connects said locking projection to one leaf and a recessed part on the other leaf, mechanism independent of the leaf for moving them into engagement, the parts when engaged holding the leaf against both horizontal and lateral movement.

2. In a bascule bridge, comprising two sections or leaves, a lock adapted to lock the leaves together where they meet at the center, said lock comprising a pivoted locking projecting part on one leaf a pivot fixed against lateral movement which connects said locking projection to one leaf and a recessed part on the other leaf, mechanism independent of the leaf for moving them into engagement, the parts when engaged holding the leaf against both horizontal and lateral movement, and means for locking the parts in position.

3. In a bascule bridge, comprising two leaves, a lock adapted to lock the leaves together where they meet at the center, said lock comprising two adjacent projecting parts on one leaf and a recessed part on the other leaf opposite said projecting parts, mechanism independent of the leaf for moving them into engagement, the parts when engaged having upper and lower faces in simultaneous engagement so as to avoid play.

4. In a bascule bridge, comprising two leaves, a lock adapted to lock the leaves together where they meet at the center, said lock comprising two adjacent projecting parts on one leaf and a recessed part on the other leaf opposite said projecting parts, mechanism independent of the leaf for moving them into engagement, the parts when engaged having upper and lower faces in simultaneous engagement and means for automatically keeping the projecting part in engagement with the recessed part as the parts wear.

5. A lock for bridges comprising a receiving element on one part of the structure, a second element on another part of the structure, said second element comprising two members pivotally supported at their separate ends, having projecting lugs at their adjacent ends, means for moving said members about their pivots to bring the projecting lugs into operative engagement with said receiving element.

6. A lock for bridges comprising a receiving element on one part of the structure, a second element on another part of the structure adjacent thereto, said second element comprising two members pivotally supported at their separate ends, the pivots being substantially in alignment, and having lateral projecting lugs at their adjacent ends, an actuating device for moving said adjacent ends outwardly to force said projecting lugs outwardly and away from each other and into said receiving element, said receiving element having services against which the projecting lugs are wedged so as to clamp the elements together.

7. A lock for bridges comprising a toggle having its members connected with fixed pivots, said members provided with projecting lugs and means for operating said toggle to engage a receiving part for the projecting lugs.

8. A lock for bridges comprising a toggle having its members connected with fixed pivots, said members provided with projecting lugs at the adjacent ends of the toggle members and means for operating said toggle to engage a receiving part for the projecting lugs, said lugs having a clamping action on the receiving part.

9. A lock for bridges comprising a toggle having its members connected with fixed pivots, said members provided with projecting lugs and means for operating said toggle to engage a single receiving part for the projecting lugs, said lugs having a clamping

action on the receiving part on two surfaces thereof.

10. A lock for bridges comprising a toggle having its members connected with fixed pivots, said members provided with projecting lugs at the adjacent ends of the toggle members and means for operating said toggle to engage a receiving part for the projecting lugs, and locking means for automatically locking the toggle in its locking position.

Signed at Chicago, county of Cook and State of Illinois, this 11th day of December 1920.

JOSEPH B. STRAUSS.