A. H. SCHERZER, DEC'D.
A. G. ZIMMERMAN AND D. G. SCHERZER, EXECUTORS.
BASCULE BRIDGE.
APPLICATION FILED MAR. 3, 1913. RENEWED SEPT. 30, 1920.

**1,370,999.** **Patented Mar. 8, 1921.**

2 SHEETS—SHEET 1.

Fig. 1.

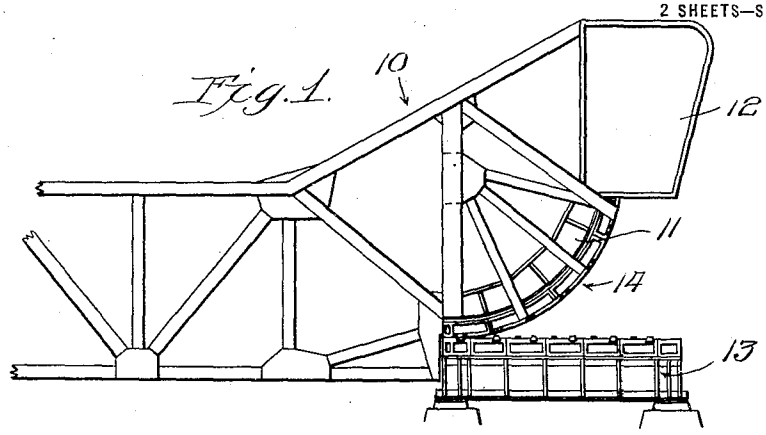
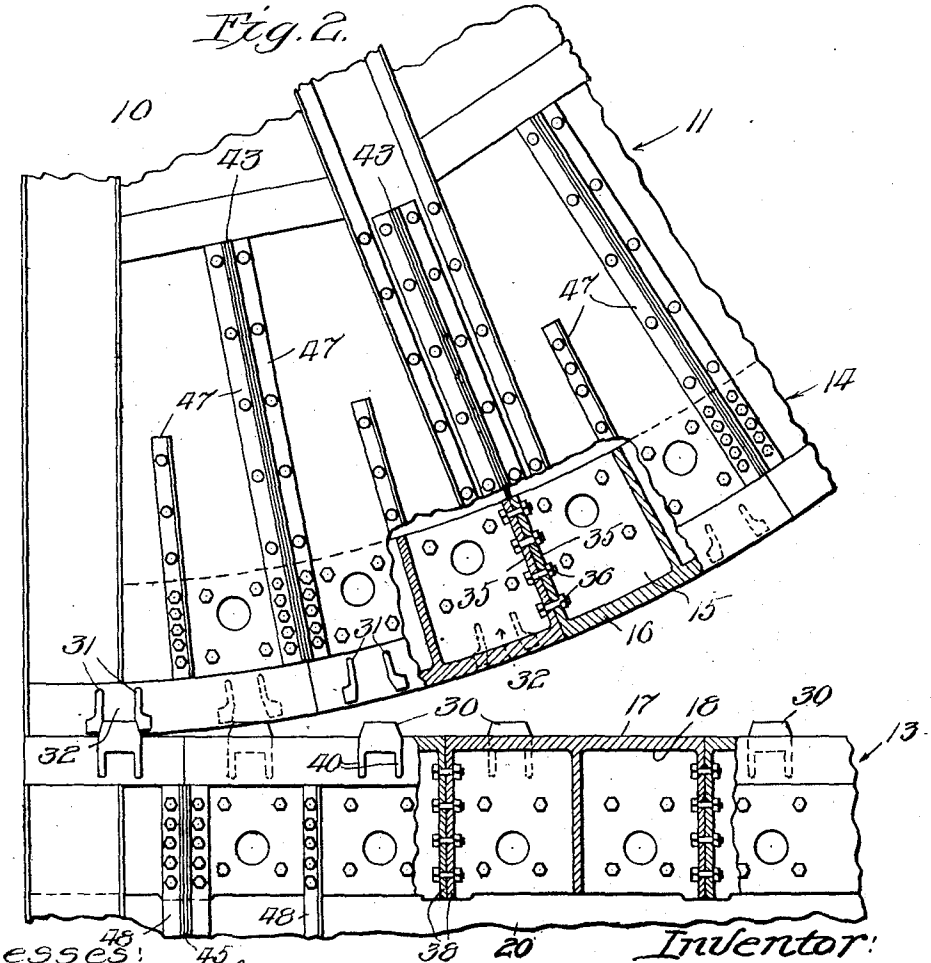



Fig. 2.




Witnesses:
Harry S. Gaither
D. G. Dowle.

Inventor:
Albert H. Scherzer
by William L. Ball
Atty

A. H. SCHERZER, DEC'D.
A. G. ZIMMERMAN AND D. G. SCHERZER, EXECUTORS.
BASCULE BRIDGE.
APPLICATION FILED MAR. 3, 1913. RENEWED SEPT. 30, 1920.

**1,370,999.** **Patented Mar. 8, 1921.**

2 SHEETS—SHEET 2.

Fig 3.

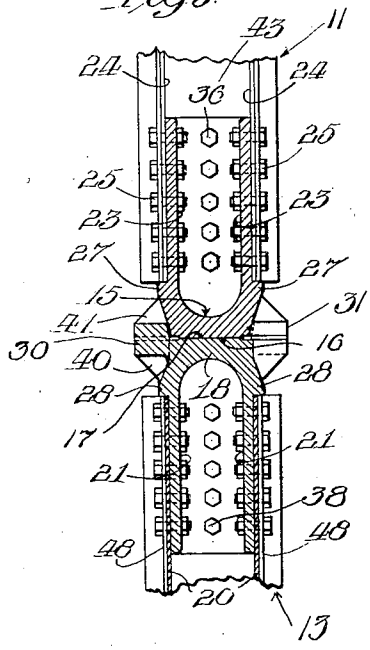



Fig 4.

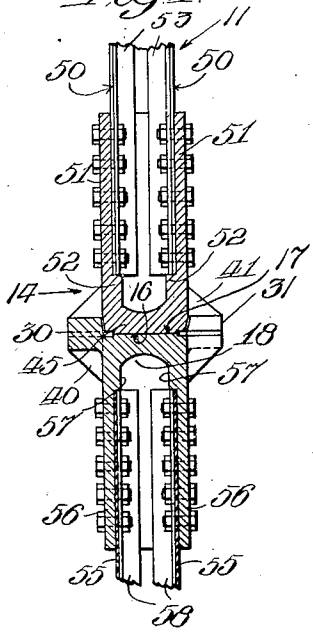



Fig 5.

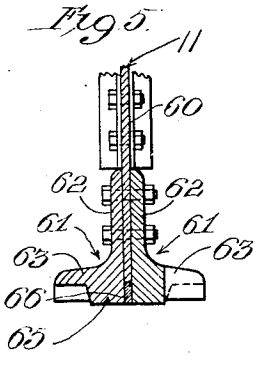
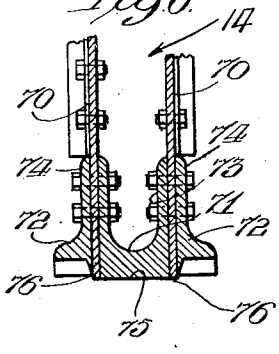



Fig 6.




Witnesses:
Harry S. Gaither
G. E. Dowle.

Inventor:
Albert H. Scherzer
by William L. Hall
Atty.

# UNITED STATES PATENT OFFICE.

ALBERT H. SCHERZER, OF CHICAGO, ILLINOIS; ALBERT G. ZIMMERMAN AND DONNA G. SCHERZER EXECUTORS OF SAID ALBERT H. SCHERZER, DECEASED.

## BASCULE-BRIDGE.

1,370,999. Specification of Letters Patent. Patented Mar. 8, 1921.

Application filed March 3, 1913, Serial No. 751,732. Renewed September 30, 1920. Serial No. 413,941.

*To all whom it may concern:*

Be it known that I, ALBERT H. SCHERZER, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Bascule-Bridges; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in bascule bridges of the rolling lift type, and refers more specifically to improvements in the tread portions of the segments or bearers upon which the bridge leaf rests and rolls and to the track by which said segments are supported.

The purpose of the invention is to provide an improved tread for the segment or bearers of such bridges with a view to strengthening the segments at the tread portions and to provide means whereby sectional tread and track portions may be applied to the segments and track girders, respectively, in such a way as to be separately removable, so as to thereby enable defective or injured tread or track sections to be removed and replaced by perfect ones. A further object of the invention is to provide an improved bearing between the segment treads and the tracks on which they rest and roll so arranged as to concentrate the load toward the center of the track or to the median longitudinal line thereof, and avoid excessive pressure being brought on the sides of the tread or the track in a manner tending to injure the same. A further object of the invention is to provide a sectional tread structure wherein the stress is transmitted from the tread sections to the segments or bearers in a manner to equalize the stress on the web or webs of the segments.

The invention consists in the matters hereinafter set forth and more particularly pointed out in the appended claims.

In the drawings;—

Figure 1 is a partial side elevation of a rolling lift bridge and one of its supporting tracks or girders, equipped with my improvements.

Fig. 2 is an enlarged partial section and partial elevation of the segment and track.

Fig. 3 is a section taken through the segment and track girder.

Figs. 4, 5 and 6 are similar views showing modifications of the tread and track structures.

As shown in the drawings, 10 designates the shore end of a rolling lift bridge leaf, 11 one of the segments or bearers on which the leaf rests and rolls, 12 the counter weight for the leaf and 13 one of the track girders which supports the leaf. These parts, in themselves, may be of any usual or preferred construction and need not be further described except as to their relation to the features constituting the present invention.

The tread, designated as a whole by 14, is made up of a plurality of relatively short sections 15, which are preferably made of cast metal and have curved bearing faces 16 that are adapted for rolling contact with the straight upper faces 17 of the track members or sections 18 carried by the track girder 13. The said bearing faces 16 and 17 of the tread and track sections are of relatively narrow transverse width, so that the load transmitted from the segments or bearers to the tracks is a concentrated load on parts of the tread and track sections which are built sufficiently massive to support the load brought upon the same.

The said track is herein shown as made up of a plurality of relatively short sections or members 18 which are attached to the webs 20 of the track girders in any suitable or preferred manner. As shown in Fig. 3, the track girders or sections 18 are provided with flanges 21, 21 which fit between and flat against the sides of the webs 20, 20 of the track girders and are bolted or otherwise rigidly secured thereto. Thus a defective or injured track section may be removed and replaced by a perfect section, and thereby avoid the removal of the entire girder track.

The tread sections are also herein shown as provided with parallel flanges 23, 23 which fit inside of and flat against the webs 24, 24 of the segment, when the latter is of a double web structure, and are fastened thereto by means of bolts 25, so as to thereby enable the said sections to be readily removed from and replaced on the segments or bearers as necessity requires.

In order that the bolts or rivets shall be relieved from shearing stresses due to the transmission of the load from the segment

webs to the tread sections, the lower edges of the webs may bear directly with a metal to metal contact against outwardly facing shoulders formed on thickened portions or ribs 27, 27 at the outer faces of the flanges 23 of the tread sections 15, as shown most clearly in Fig. 3. The fastening bolts 25 are thus relieved from directly transmitting the load stresses from the segment webs to the tread sections, so that the function of the bolts is principally to hold or fasten the tread sections to the segment plates or webs. Similarly the load stresses may be transmitted from the track sections 18 directly to the webs of the track girders by metal to metal contact through engagement of the upper edges of said track webs with shoulders formed on thickened parts or ribs 28, 28 on the outer sides of the flanges 21 of the track sections, as most clearly shown in Fig. 3.

The said tread sections are formed with end walls or flanges 35 and the adjacent end walls or flanges of adjoining sections fit flat against each other and are rigidly secured to each other by means of the bolts or rivets 36. This construction provides an exceedingly strong and rigid connection between the separable tread sections so as to form, when the parts are assembled and fastened together, practically a continuous or one piece tread.

The ends of the track sections may be likewise provided with end walls or flanges 38 which in like manner are fitted flat together and are bolted or otherwise rigidly secured together.

When teeth or racks are employed on the segment treads and tracks to prevent displacement of the bridge segments relatively to the track girders, they are located laterally exterior to the center or load transmitting bearings between the treads and tracks. As herein shown, the track sections 18 are provided at their sides, laterally exterior to their bearing faces 17, with upstanding teeth 30 which extend above the bearing faces, and the tread sections are provided, laterally exterior to their bearing faces 16, with separated lugs 31 between which are formed interspaces or notches 32 to engage over the teeth 30 of the track. Obviously this arrangement may be reversed; that is to say, the track sections may be formed with spaces to receive teeth which may depend from the lateral margins of the tread sections. In the constructions shown and suggested the teeth and lugs of the parts are self-cleaning, in that should snow, ice or dirt fall upon the track it would not tend to clog the parts in the same manner as though the interlocking parts were formed on the central load transmitting portions of the track and segment. This will be made apparent from an inspection of Fig. 2. Therefore, the danger of the notches being closed by snow, ice or dirt to an extent to prevent the teeth or projections to enter therein, and a consequent tendency of displacement of the bridge leaf, is avoided.

The said teeth 30 of the track sections, and the lugs 31 of the tread sections may be reinforced or strengthened by the angular fillets or webs 40, 41, respectively, as shown in Figs. 2, 3 and 4.

When the double web segments are reinforced by the lateral diaphragms 43, as shown in Figs. 2 and 3, said diaphragms may terminate at the upper ends of the flanges 23 and bear at their lower edges against the upper edges of the end flanges or walls 35 of the tread sections so as to transmit the load from the said diaphragms by a metal to metal contact between the said diaphragms and tread sections. Similarly the end flanges or walls of the track sections may bear a like relation to transverse diaphragms 45 between the webs of the track girder.

The lower edges of the segment webs are herein shown and preferably may be formed concentric to the axis of the arc of the girder tread, and the shoulders on the tread sections will, in such event, be formed on a like arc so as to thereby facilitate the fitting of the edges of the webs against the shoulders of the tread segments. So far as the broader features of the invention are concerned, however, the edges of the segment webs and the coacting shoulders of the tread sections may be otherwise formed, as at an angle to each other.

The webs are reinforced on their outer sides by the angle bars 47, 47 arranged singly and in pairs, as shown best in Fig. 2, and said angle bars terminate at their lower ends against and in contact with the shoulders of the thickened portions or ribs 27, so as to thereby increase the area of metal to metal contact between the segments and their tread sections, and thus further relieve the bolts or rivets of the shearing stresses due to the transmission of the load from the segments to said tread sections. The webs 20 of the track girders are likewise reinforced by angle bars 48 which bear at their upper ends against shoulders formed on the thickened portions or ribs 28 of the flanges 21 of the girder track sections 18, as shown in Fig. 3.

In the construction shown in Fig. 4, the webs 50 of the segments enter between and fit flat against the inner faces of the flanges 51 of the tread sections, and bear at their lower edges with a metal to metal contact against shoulders formed on thickened portions or ribs 52 formed on the inner sides of said tread sections. The stiffening members 53 for the segment webs or plates 50 are arranged on the inner sides of the segment webs or plates and bear at their lower ends

against the shoulders formed on the ribs 52. Likewise the webs 55 of the track girders may be arranged between and fit flat against the flanges 56 of the track girder sections, shown in Fig. 4, with their upper edges bearing against shoulders formed on ribs or thickened portions 57 at the inner sides of the said latter flanges. The stiffening angle bars 58 for said track girder may also be arranged between the webs 56 and may bear at their upper ends against the shoulders formed on said ribs 57.

In Fig. 5 I have shown a modified form of the tread section adapted to a single web segment which may be employed in relatively light bridges. As shown in said figure, 60 designates the single web of the segment and 61, 61 designate the two parts of the tread section which are applied to the sides of and are bolted or otherwise secured to the segment web. Said tread sections are preferably made of cast metal and sufficiently massive to withstand the loads brought thereon. Each consists of a flange member 62 which fits flat against the side of and is bolted or otherwise secured to the web 60, and a laterally extending tread member 63 formed at its lateral margin with teeth or notches to engage the complemental interlocking parts of the supporting track below. The central parts 65 of said sections 61 between said teeth or notches constitute the bearing surface of the tread. Preferably, in this construction, the lower edge of the web 60 terminates short of the bearing faces 65, and the space between the lateral tread members beneath the web may be filled with a filling piece 66 that may be applied to and secured in said space in any suitable manner. For instance, said filling piece may be welded to the track members or webs, or may be formed by filling said space with molten metal and allowing it to harden therein.

In Fig. 6 a similar tread is shown as applied to a double web segment. In this construction, 70, 70 designate the two spaced webs of the segment. The tread sections consist of three parts, to wit, a central member 71, disposed between the webs and side parts 72, 72 at the outer sides of said webs. Said members 71 and 72 are formed with flanges 73, 74, respectively, which overlap and are bolted or otherwise secured to the webs. On the central member 71 is formed the bearing face 75 of the tread, while the laterally directed portions of the outer members 72, 72 carry the notches or teeth to engage with the corresponding parts of the track below, not shown.

The track sections and girders may, in the constructions shown in Figs. 5 and 6 be fabricated in a manner generally similar to the segment webs and tread sections therein shown.

So far as is concerned the construction above described with respect to the central bearing and lateral teeth or racks of the treads and tracks, the same may be otherwise arranged. Such tread and track thus arranged may be formed of less or a greater number of parts than shown, or each of a single part. Other variations of the structural details may be made without departure from the scope of the invention and the invention is not limited to such details except as made the subject of specific claims or as imposed by the prior art.

I claim as my invention:—

1. A rolling lift bridge comprising a leaf adapted to rest and roll on a support, a tread comprising tread sections attached to the leaf and having curved central bearing faces to engage said support and a track on said support engaged by said tread sections, said track and tread sections being provided laterally outside of their bearing faces with interlocking holding teeth, and the adjacent bearing faces of said track and tread sections being transversely narrower than the parts on which they are formed.

2. A rolling lift bridge comprising a leaf provided at its heel end with a segmental tread, a support on which said segment rests and rolls, said tread comprising tread sections carried by the leaf and having centrally disposed, unbroken curved load supporting faces to engage said support and provided laterally outside of and above said load supporting faces with fixed self-cleaning holding teeth or projections, the leaf being provided with a web segment and the tread sections being provided with flanges that overlap the web segment, with means to removably secure them thereto.

3. A tread for rolling lift bridges comprising a plurality of sections each provided with a solid or unbroken central load supporting face and provided laterally exterior to said load supporting face with projections formed to provide between them interspaces which are open at their tops and bottoms.

4. A tread for rolling lift bridges comprising a plurality of sections provided with solid or unbroken curved central load supporting faces and laterally exterior to said faces with fixed holding teeth or projections, and provided also with radial flanges to engage in overlapping engagement a member of the bridge, whereby to removably attach the sections to the bridge, and shoulders on the sections adapted for metal to metal engagement with parts carried by the bridge, for the purpose set forth.

5. A rolling lift bridge structure comprising a support for a rolling leaf which embraces a girder and a plurality of load supporting track sections thereon, with means to removably support the track sections on the girder.

6. In a rolling lift bridge structure, a sup-

port for a rolling leaf comprising a girder and a plurality of track sections thereon for engagement with the segmental tread sections of the leaf, with means to removably support the track sections on the girder, said girder comprising two vertical webs and the track sections embracing a central load supporting surface and provided laterally exterior thereto with holding projections, and flanges on said track sections to overlap said webs, with means to rigidly affix them thereto.

7. In a rolling bridge, a supporting girder for the bridge, and a removable sectional track thereon provided with an unbroken central supporting face and at the side of said surface with fixed holding teeth or projections which rise above the plane of said supporting face.

In testimony that I claim the foregoing as my invention I affix my signature in the presence of two witnesses, this 1st day of March, A. D. 1913.

ALBERT H. SCHERZER.

Witnesses:
G. E. DOWLE,
F. ROMAN ASZMAN.