A. H. SCHERZER.

LOCKING MEANS FOR BASCULE BRIDGES.

APPLICATION FILED NOV. 26, 1909.

968,987.

Patented Aug. 30, 1910.

4 SHEETS—SHEET 1.

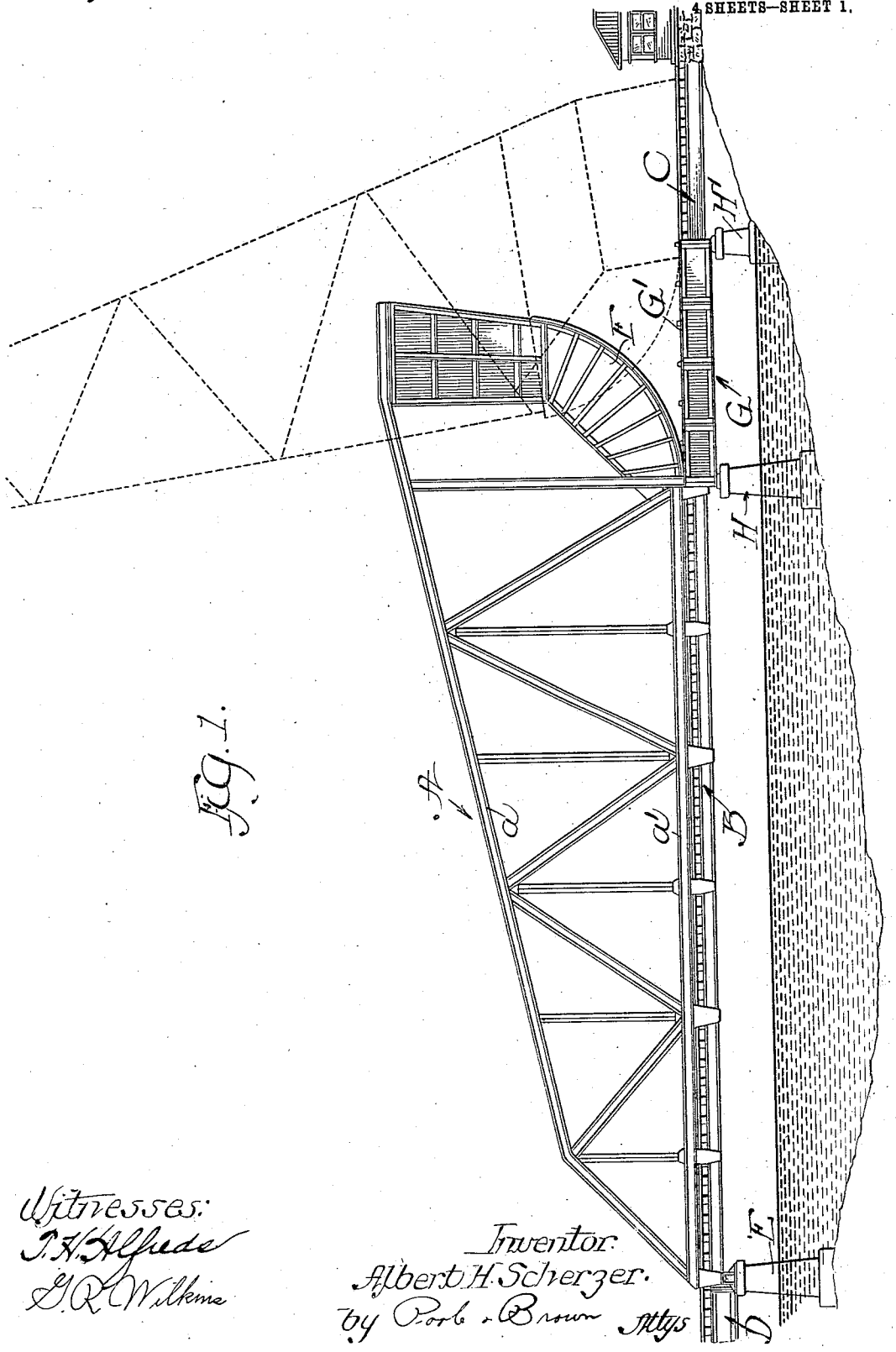

Fig. 1.

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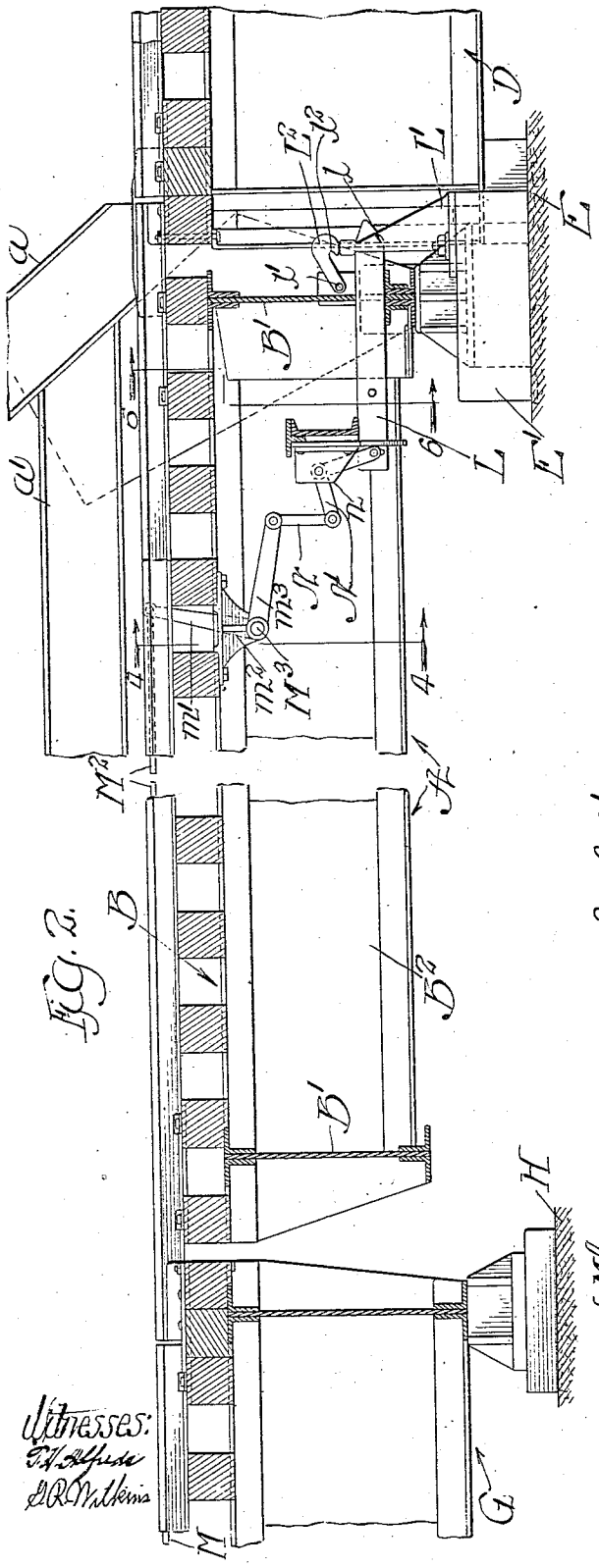

FIG. 2.

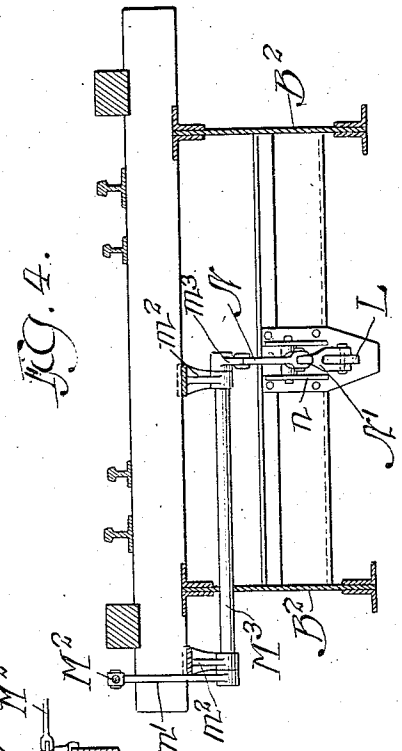

FIG. 4.

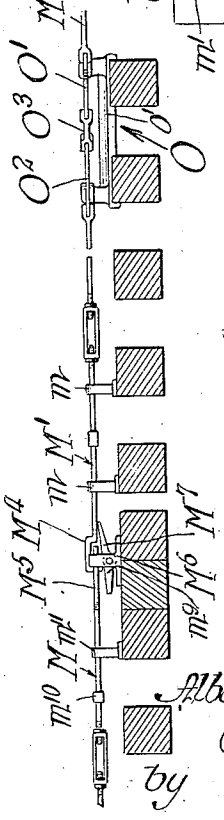

FIG. 3.

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4 SHEETS—SHEET 3.

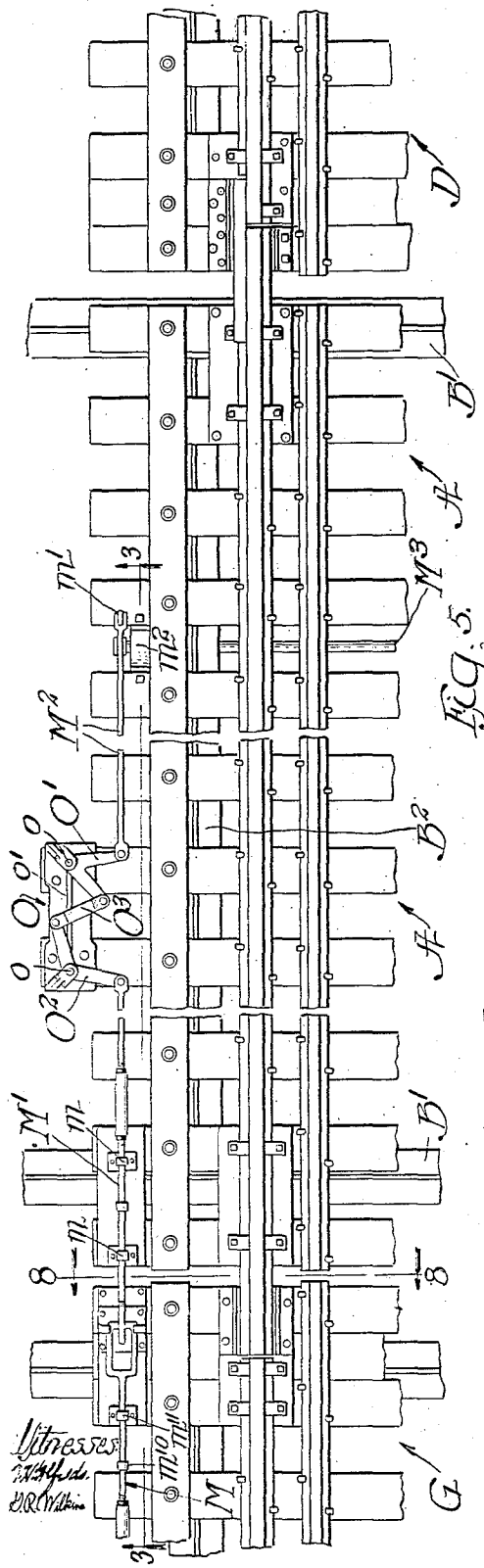

FIG. 5.

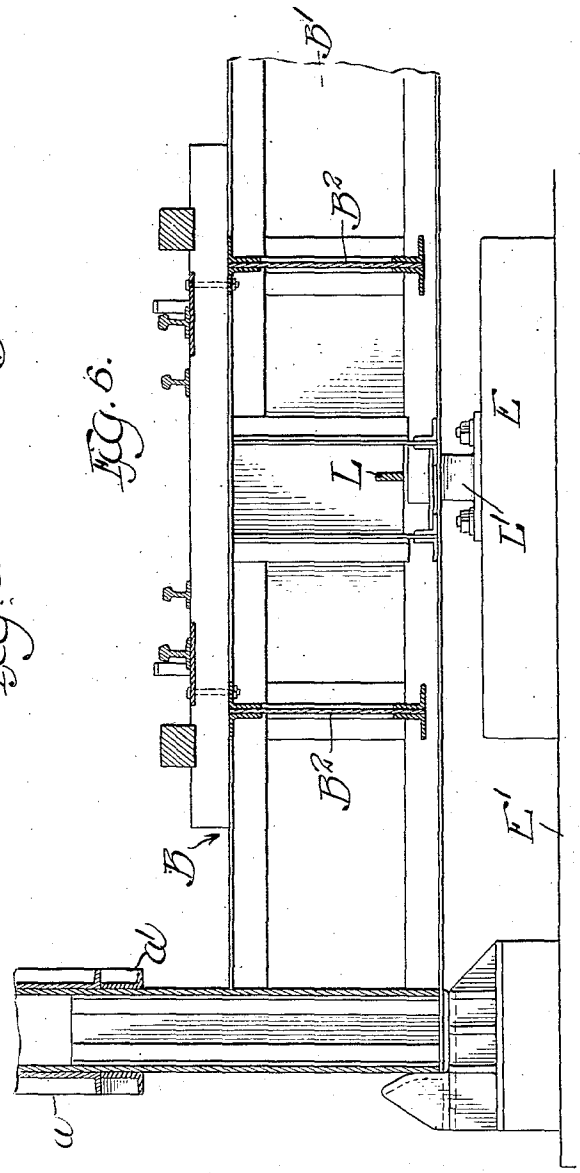

FIG. 6.

Witnesses

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4 SHEETS—SHEET 4.

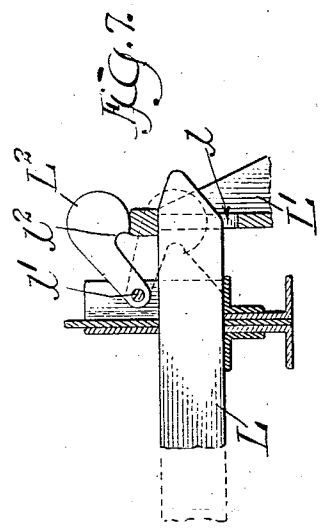

FIG. 7.

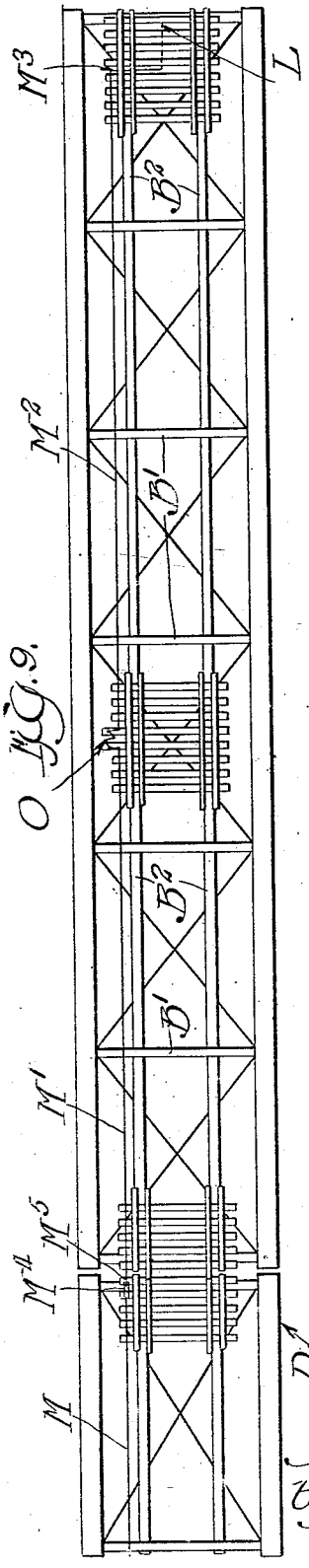

FIG. 9.

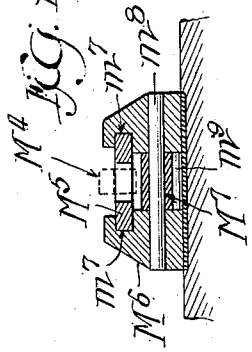

FIG. 11.

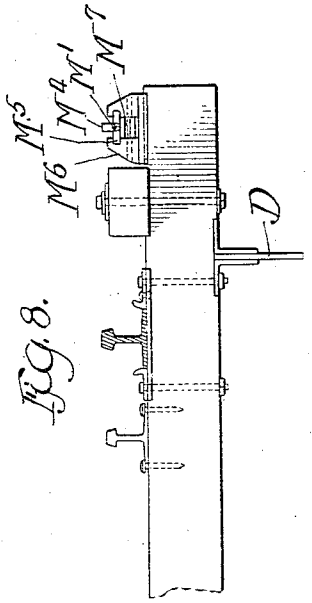

FIG. 8.

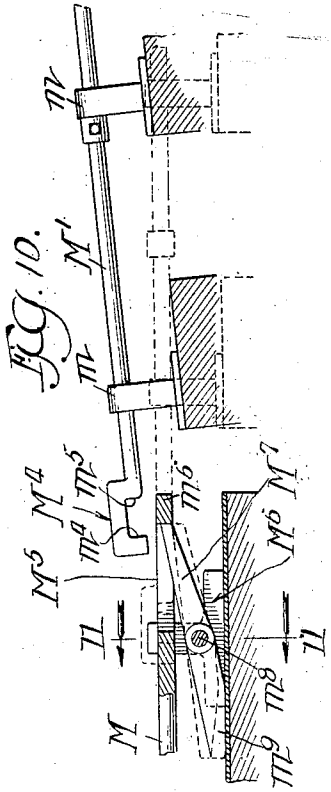

FIG. 10.

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UNITED STATES PATENT OFFICE.

ALBERT H. SCHERZER, OF CHICAGO, ILLINOIS.

LOCKING MEANS FOR BASCULE-BRIDGES.

968,987. Specification of Letters Patent. Patented Aug. 30, 1910.

Original application filed July 30, 1907, Serial No. 386,254. Divided and this application filed November 26, 1909. Serial No. 529,844.

To all whom it may concern:

Be it known that I, ALBERT H. SCHERZER, a citizen of the United States, of the city of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Locking Means for 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 letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in bascule or lift bridges of that kind wherein the bridge is opened and closed by the swinging movement of a movable span or leaf in a vertical plane and refers more specifically to an improved means for locking a single leaf span in closed position.

My improvements are shown in the accompanying drawings as applied to that type of bascule bridge known in the art as a "rolling lift bridge" or one in which the swinging span is provided with rolling segments resting on stationary tracks or supports, but my improvement may be applied also to other types of bascule bridges.

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

In the accompanying drawings: Figure 1 is a side elevation of the bascule bridge provided with a locking device embodying my invention. Fig. 2 is a longitudinal, vertical section on an enlarged scale of the bridge span and parts of the bridge approaches, adjacent to both ends thereof, the central portion of the bridge span being broken away. Fig. 3 is a longitudinal, detail section taken on line 3—3 of Fig. 5. Fig. 4 is a transverse section taken on the line 4—4 of Fig. 2. Fig. 5 is a top plan view of one side of the track supporting floor of the bridge leaf and parts of the stationary tracks on the bridge approaches at both ends of the leaf. Fig. 6 is a partial cross-section taken on line 6—6 of Fig. 2 of the front or lifting end of the bridge leaf. Fig. 7 is a detail illustrating a detent for holding the locking device in its retracted position. Fig. 8 is a detail sectional view taken upon the line 8—8 of Fig. 5. Fig. 9 is a diagrammatic plan view of the bridge leaf and its approach, illustrating the arrangement of the operating parts of the locking device. Fig. 10 is an enlarged detail view illustrating the separable connection between the parts of the locking device and operating rods which are mounted on the movable span and on the stationary structure. Fig. 11 is a section upon line 11—11 of Fig. 10.

As shown in the drawings, A designates, as a whole, the single span or leaf of the bridge, embracing longitudinal side trusses having upper and lower chords a, a^1, and a floor frame B located at or below the level of the lower chords of said trusses.

The bridge illustrated is a railway bridge and the floor frame thereof embraces transverse beams B^1 and longitudinal stringers B^2 upon which are supported the ties of the railroad track.

C designates the bridge approach at the rear end of the bridge and D the track support at the front or lifting end of the bridge, which latter support may comprise a fixed or stationary bridge span. One end of said track support is shown as resting on a pier E which supports the front end of the leaf when the latter is in its closed position.

F, F designate rolling segments located at the rear or approach end of the leaf. Said segments are attached to or form parts of the trusses of the leaf and, as shown, are located in the planes of said trusses.

G, G designate horizontal girders which are supported on piers H, H^1 and form part of the approach C. Said girders support on their upper faces track plates indicated as a whole by G^1, upon which the segments F, F rest and upon which they roll when the bridge is opened and closed.

Referring now to mechanism illustrated for locking the bridge in its closed position, the same is made as follows: L designates a longitudinally sliding locking bar that is mounted in guides in the forward end of the floor structure of the bridge and adapted to extend, when in its outermost position slightly beyond the forward end of the bridge leaf. L^1 designates a socket piece supported on and rising from the pier cap-block E^1. Said socket piece is provided with a socket l which is adapted to receive the outer end of the locking bar when the latter is thrust outwardly. The said locking

bar is withdrawn from the socket piece, to permit the bridge to open, and is thrust outwardly to its locking position, through the medium of a locking rod, which extends lengthwise of the bridge and the stationary bridge approach and is operated from a point in said approach. Said locking rod is carried partially on the movable leaf and partially on the stationary approach, and it embraces three parts or members M, M^1, M^2, the parts M^1, M^2 being carried on the leaf and the part M being mounted on the stationary approach. The part M^1 of the operating rod is supported and guided at its rear end in guides m, m on the span, and the forward end of the part M^2, as shown in Figs. 4 and 6 is connected through the medium of a horizontal, transverse rock-shaft M^3 and a system of levers with the rear of the locking bar. As shown in the drawings (Fig. 2), said forward end of the part M^2 of the operating rod is connected with a crank arm m^1 on one end of a rock-shaft M^3, said rock-shaft having bearing in brackets m^2 depending from the rail ties. The other end of said rock-shaft carries a crank arm m^3 which is connected by a link N with one arm of a bell-crank lever N^1 pivoted to a bracket or support n, the other arm of said bell-crank lever N^1 being loosely or pivotally connected with the rear end of the sliding lock bar. The sliding locking bar L is locked in its retracted position, when the bridge is swung upwardly, through the medium of a gravity acting detent L^2 (Figs. 2 and 7) which is pivoted by a pin or stud l^1 to a stationary part of the bridge floor structure adjacent to the forward end of the said locking bar. The said locking detent is provided with a rearwardly facing shoulder l^2 which is adapted to engage the front pointed end of the locking bar, in the manner indicated in dotted lines in Fig. 7, to lock the same in its retracted position at a time when the bridge is swung upwardly. Said detent is provided to prevent the locking bar from being thrown outwardly by centrifugal action in case the bridge leaf be swung downwardly with such force that this would be liable to occur. When the bridge is in its closed or lowermost position, the free or weighted end of the detent L^2 rests upon the upper end of the socket piece L^1, which latter lifts the detent free from the locking bar as the latter approaches a position in line with its socket, as shown in full lines in Figs. 2 and 7. Inasmuch as the parts or members M and M^1 of said operating rod separate as the bridge leaf swings upwardly, I have provided a joint of suitable construction to afford automatic separation and connection of the said members in the opening and closing of the span. As shown in the drawings, such joint is made as follows:—The rod member M^1 on the span is provided on its end with a downwardly opening hook M^4 which is adapted to engage a horizontally arranged loop M^5 formed on or carried by the adjacent end of the rod member M (Fig. 3). The hook M^4 is formed to provide forwardly and rearwardly facing shoulders marked m^4, m^5, respectively (Fig. 10) which are adapted for engagement by the transverse member m^6 of the loop M^5 in order that longitudinal motion may be transmitted to the part M^1 in both directions from the member M, as will be clear from an inspection of Fig. 10. The said loop M^5 on the part M of the rod, has horizontally sliding engagement with oppositely disposed grooves m^7 formed in a guide block M^6 (Figs. 10 and 11) on the bridge approach. As a means for temporarily holding said rod member M in position for engagement therewith of the hooked end of the rod member M^1 when the bridge is being closed, a swinging lever or detent M^7 is provided, which is pivoted between its ends on a pivot pin or rod m^8 extending between the side members of the guide-block M^6, in such manner that its outer end is adapted to be swung upwardly into engagement with the cross bar m^6 on said loop M^5. The rear end m^9 of said swinging detent is overweighted so that the forward end thereof tends to rise by gravity of said overweighted rear end. The withdrawal of the locking bar L is effected by a forward or inward movement of the member M of the operating rod. When the locking bar is in its locked position the locking detent M^7 is held by the overweight of its rear end against the under face of the rod member M^1, on the bridge leaf, near the hook M^4, as shown in Fig. 3. When said rod members M and M^1 are moved to effect the release of the locking bar L, the forward or inner end of the locking detent M^7 swings up into the loop M^5, in the manner shown in Fig. 10, and serves to hold the rod member M from being drawn rearwardly. Said rod member M is provided with a collar m^{10} adapted to engage one of the supporting bearings m^{11} of the rod and thus lock the said member M from being shifted inwardly. Thus it will be seen that loop M^5 of the rod member M will be held in position to be engaged by the hooked end of the member M^1 when the leaf is swung to its closed position. Before the bridge leaf is fully closed the hook M^4 engages the forward end of the detent M^7 and releases it from the loop M^5 whereupon the operating rod as a whole may be operated to thrust the locking bar L into its socket.

In the present construction the members M^1 and M^2 of the operating rod which are mounted on the bridge leaf, are connected by a compensating device, designated as a whole by O, (Fig. 5). The function of said

compensating device is to transmit from one to the other the stress due to the weight of the two rod sections M^1 and M^2, in such manner that the weights of the two sections counteract or neutralize each other and endwise displacement of said rod, when the leaf is open, is prevented. The said compensating device O embraces a bell-crank lever O^1 to which the rod member M^2 is pivoted, a like bell-crank lever O^2 to which the rod member M^1 is likewise pivoted, and a link O^3 connecting the adjacent arms of said bell-crank levers. The said bell-crank levers are pivoted at their angles to pivot pins *o* fixed in a casting o^1 that is secured to the adjacent ties. It will be understood that the compensating device described will be located at the longitudinal center of the rod members M^1 and M^2 on the bridge leaf or at such point that the rod members M^1 and M^2 will be of substantially equal weight. It will be observed, by reference to Fig. 5, that when the span is open or in its nearly upright position the downward thrust of the rod member M^2 acts through the levers O^1 and O^2 in a manner tending to lift the member M^1, thus preventing the weight of the rod, as a whole, from tending to throw the locking bar L into its locking position.

It is to be understood that in the accompanying drawings I have illustrated one practical embodiment of my invention, but inasmuch as the details of construction illustrated may be variously modified without departure from the essential features of the invention, I do not wish to be limited to the specific details of construction shown and described, except so far as the same are claimed in the appended claims as constituting parts of my invention.

I claim as my invention:—

1. In a bascule bridge, the combination with a swinging bridge leaf, of a locking device for the front end of the leaf, and an endwise movable operating rod for said locking device, comprising two members one of which is mounted on the moving leaf and the other on the bridge approach and a separable connection for joining the meeting ends of said members of said operating rod, adapted for automatic connection with and disconnection from each other when the leaf is opened and closed.

2. In a bascule bridge, the combination with a swinging leaf, of a locking device for the front end of the leaf, an endwise movable operating rod for said locking device, consisting of two members, one of which is carried on the leaf and the other on the bridge approach, and a separable connection for joining the said members, comprising a hook on one of said members and a horizontally arranged loop on the other member.

3. In a bascule bridge, the combination with a swinging leaf, of an endwise sliding locking bar on the front end of the leaf, a socket piece on the bridge approach adapted to receive the locking bar, and a movable detent mounted on the leaf and adapted to engage the locking bar to hold the latter in its retracted position during the swinging movement of the leaf.

4. In a bascule bridge, the combination with a swinging leaf, of an endwise sliding locking bar on the front end of the leaf, a socket piece on the bridge approach adapted to receive the locking bar, and a gravity acting pivoted detent mounted on the span and adapted to engage the locking bar to hold the latter in its retracted position during the swinging movement of the leaf, said detent extending beyond the outer end of the locking bar when the latter is retracted and being adapted for contact with the said socket piece.

5. In a bascule bridge, the combination with a swinging leaf, of a locking device on the front end of the leaf, an endwise movable operating rod for said locking device consisting of two members, one of which is mounted on the leaf and the other on the bridge approach, a separable joint for uniting said members and a locking detent adapted to engage the rod member which is mounted on the approach, to hold the said member from endwise movement during the swinging movement of the leaf.

6. In a bascule bridge, the combination with a swinging leaf, of a locking device on the front end of the leaf, an operating rod for the said locking device consisting of two members, one of which is carried on the leaf and the other mounted on the bridge approach, a joint for detachably connecting the two members of the rod, embracing a horizontal loop on the approach member and a hook on the span member provided with a downwardly directed end and a detent for holding the approach member of the rod from endwise movement, consisting of a pivoted detent lever adapted to enter said loop and to be disengaged from the loop by contact of the hook therewith in the closing of the leaf.

7. In a bascule bridge, the combination with a swinging leaf, of a locking device on the front end of the leaf, an operating rod for said locking device extending longitudinally of the leaf and movable endwise thereon, said operating rod in its part upon the leaf consisting of two sections, and a compensating device joining said sections so constructed as to transmit endwise motion from one section to the other to effect the counterbalancing of one section by the other.

8. In a bascule bridge, the combination with a swinging leaf, of a locking device for the leaf, and an operating rod for said locking device which extends longitudinally of the leaf, said locking device in its part which is mounted on the leaf comprising

two sections, and a compensating device joining said sections consisting of two bell-crank levers connected severally with the said sections and a link connecting said bell-crank levers.

In testimony, that I claim the foregoing as my invention I affix my signature in the presence of two witnesses, this 15th day of November A. D. 1909.

ALBERT H. SCHERZER.

Witnesses:
T. H. ALFREDS,
CLARENCE E. MEHLHOPE.