A. H. SCHERZER.

REAR END LOCK FOR BASCULE BRIDGES.

APPLICATION FILED NOV. 26, 1909.

978,493.

Patented Dec. 13, 1910.

2 SHEETS—SHEET 1.

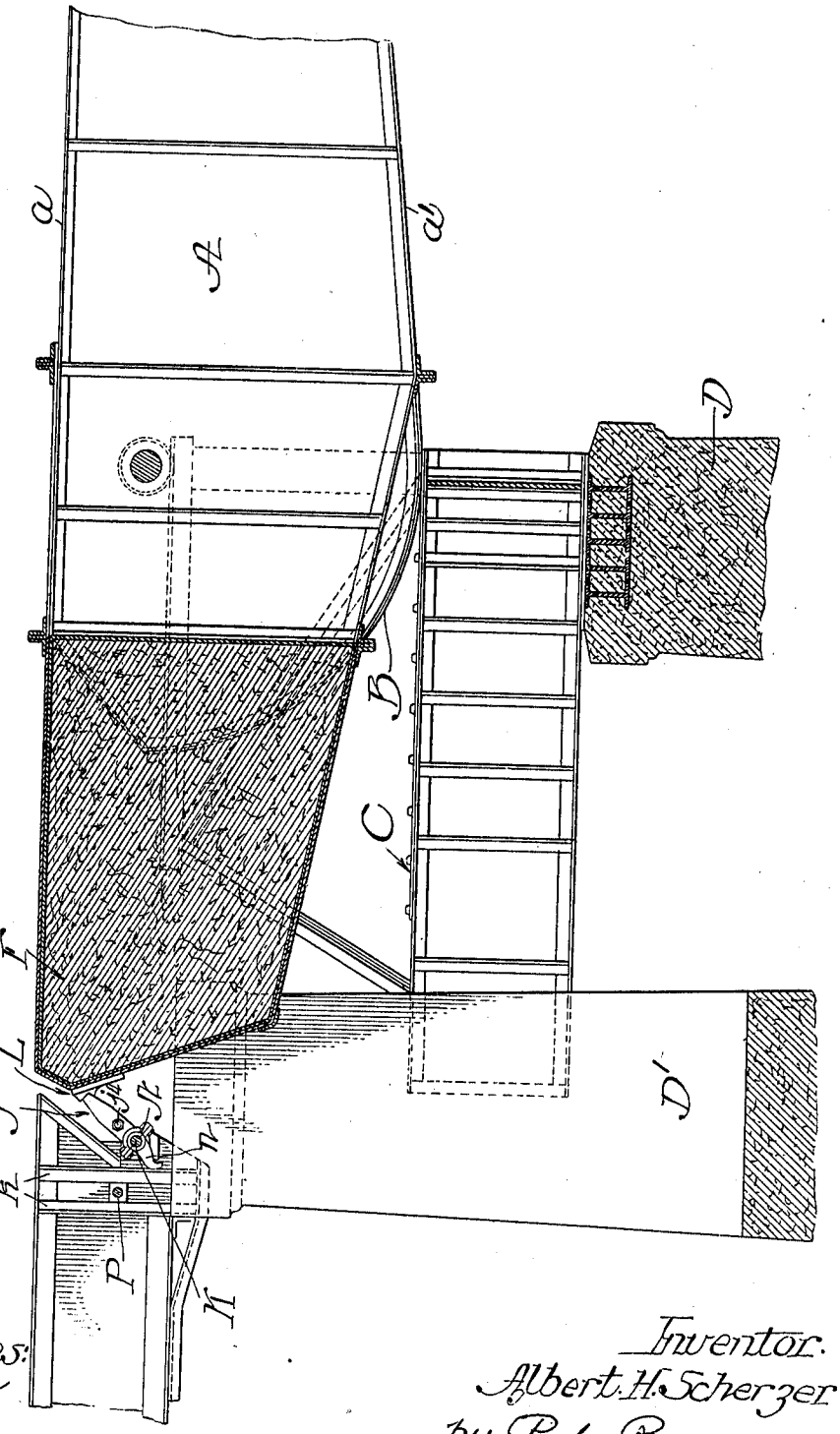

FIG. 1.

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2 SHEETS—SHEET 2.

FIG. 2.

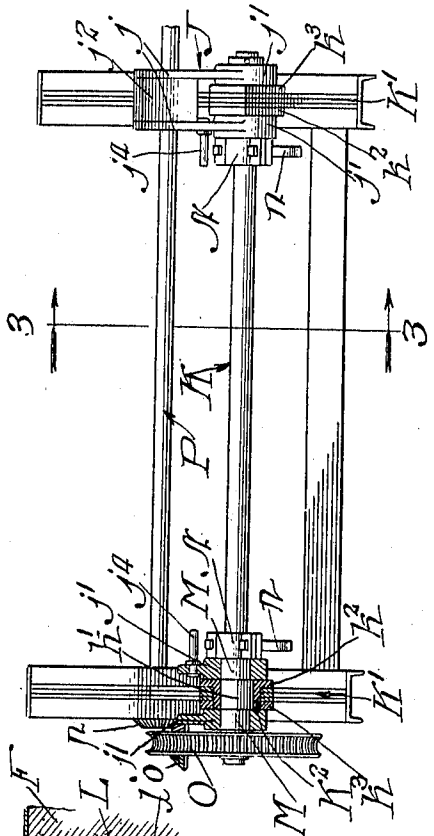


FIG. 5.

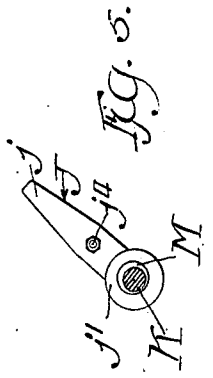


FIG. 3.

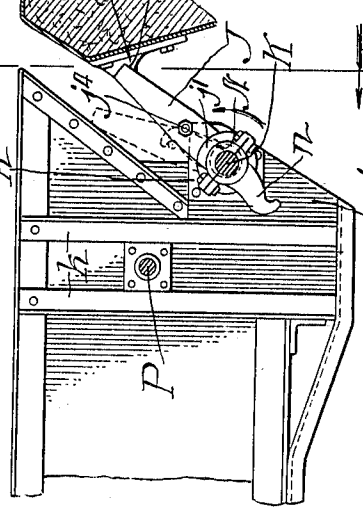
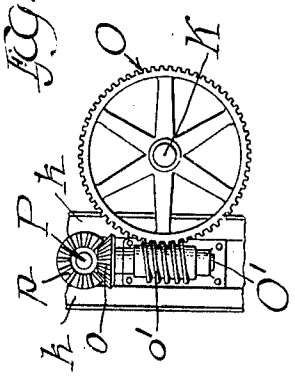


FIG. 4.



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UNITED STATES PATENT OFFICE.

ALBERT H. SCHERZER, OF CHICAGO, ILLINOIS.

REAR-END LOCK FOR BASCULE-BRIDGES.

978,493. Specification of Letters Patent. Patented Dec. 13, 1910.

Original application filed July 30, 1907, Serial No. 386,256. Divided and this application filed November 26, 1909. Serial No. 529,846.

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 Rear-End Locks 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 the kind embracing one or more movable spans or leaves which swing in a vertical plane, and more especially to a locking mechanism for holding the swinging bridge in its closed or horizontal position.

My invention is illustrated in the accompanying drawings as applied to a bascule or lift bridge of that kind known as a rolling lift bridge, or one in which the span or leaf is provided with rolling segments resting on stationary tracks or supports, and as applied to hold the rear end of the span or leaf from downward movement relatively to the bridge abutment or approach structure. A locking device constituting my invention may, however, be applied to bascule bridges of other kinds than rolling lift bridges, and may be used elsewhere than at the rear end of the span or leaf.

As shown in the accompanying drawings: Figure 1 is a detail, longitudinal, vertical section taken centrally through the bridge structure and the part of the bridge approach adjacent to the same, showing the parts thereof at the rear end of the span or leaf. Fig. 2 is a sectional view taken upon line 2—2 of Fig. 3 showing in elevation the locking device for the rear end of the leaf and the parts at the left hand side of the figure in vertical section. Fig. 3 is a detail section taken upon the line 3—3 of Fig. 2. Fig. 4 is a detail side view of the worm gear through which the lock is operated. Fig. 5 is a detail view of one of the locking detents and one of the eccentrics on which the same is mounted, the rotative shafts carrying said eccentrics being shown in section.

As shown in said drawings, A designates the leaf of a rolling lift bridge which comprises side trusses having upper and lower chords a, a^1. The upper chords are horizontal and the lower chords of curved form.

B designates one of the rolling segments by which the span is supported, the same being located exterior to the plane of the truss at the rear end of the leaf. Said rolling segments rest and roll on supporting tracks formed by the top surfaces of girders, one of which is indicated by C. Said girders are supported at their outer or forward ends on a pier D and at their rear or inner ends on a pier D^1. The leaf trusses extend rearwardly beyond the rolling segments B, toward the bridge approach, so that the leaf has a rearward extension which meets the stationary approach structure at a point over or adjacent to the pier D^1, and said rear extension of the leaf falls as the front end of the span rises. A space is provided for the descent of said rear extension of the leaf at the central part of the pier D^1, as plainly seen in Fig. 1.

F indicates a counterweight which is attached to the rear extension rearward of the rolling segments. This counterweight occupies a space between the upper and lower truss chords and extends transversely of the leaf or from side to side thereof. Said counterweight serves to counterbalance the leaf in the usual manner, so as to permit of the raising and lowering of the leaf with the application of a minimum amount of power.

So far as above described, the construction illustrated in the accompanying drawings corresponds with that shown in my separate application, Serial Number 386,256, filed July 30th, 1907, of which this application is a division.

The locking mechanism embodying my invention is intended for holding the bridge leaf in its closed position and acts on the rear end of the span to hold the same from moving downwardly. As shown in the drawings, said locking device is mounted on the end of the approach structure adjacent to the rear extension of the bridge leaf which descends when the bridge is opened and is located over the pier D^1. Preferably, two locking devices will be used for each leaf, one located in the plane of each truss, as shown in the drawings.

As shown in the drawings, J, J indicate two oscillatory arms or locking detents and K a horizontal, rotative shaft, on which said detents are mounted. Said shaft extends transversely of the approach structure below the level of the approach and is mounted in forwardly projecting brackets K^1, K^1 at-

tached to the approach structure. The detents J, J are mounted one on each end of said shaft K. Each arm or detent, J has its free or swinging end directed upwardly and outwardly from the shaft and is adapted to swing or oscillate toward and from the rear end of the leaf about said shaft K. Said detent when in its locking position is adapted to come beneath and engage a downwardly facing stop shoulder formed on a projection L on the rear end of the leaf structure; the said free end of said locking detent being arranged to be swung rearwardly to the position shown in dotted lines in Fig. 3, and thereby disengaged from said locking projection L to permit the rear end of the leaf to swing downwardly for opening the bridge. Said locking detent not only has oscillatory movement but is also movable endwise, means being provided for moving it endwise toward and from the stop shoulder on the leaf, so that it may be pressed and held against said stop shoulder with the effect of taking up all lost motion in the parts and holding the leaf firmly and rigidly in its locked position.

Each detent J embraces two parallel arms j, j attached to laterally separated hubs j^1, j^1 which surround the shaft K at opposite sides of bracket K^1, which consists as shown, of vertical plates attached to upright angle bars k, k on the approach structure. The outer ends of said arms j, j are connected by a steel filling piece j^2, by which the arms are connected with each other and which affords a wide bearing face on the end of the detent for engagement with the stop shoulder on the bridge leaf. The hubs j^1, j^1 of the detent are provided with bearing apertures which surround and are adapted to turn upon eccentrics M, M, secured to the shaft K at opposite sides of the bracket K^1. Said shaft K is shown as provided, between the eccentrics M, M with a concentric collar k^1 somewhat larger in diameter than the said eccentrics and which fits and turns in a sleeve K^2 which extends through the circular opening in the vertical plates constituting the bracket K and is provided at one end with a flange k^2 and at its opposite end with a ring k^3. Said flange and ring are located at opposite sides of the bracket plates and are secured thereto by rivets or bolts which extend through the flange and said ring. Mounted on the said shaft K, adjacent to one of the hubs j^1 of each detent J is a collar N provided with a radial rigid arm n. The collar N is preferably a split collar made of two parts which are clamped to the shaft K by clamping bolts. Said arm n is adapted, when the shaft is turned, to engage a stop pin j^4 which is secured in the adjacent arm j of the detent and projects laterally therefrom into the path of said arm n.

The eccentrics M, M arranged as described operate to give endwise movement to the detent J, so as to move it toward and withdraw it from the stop projection L in the bridge leaf. The parts are so arranged that when the arm n is swung to a position at the side of the shaft opposite or remote from the detent, the latter will be in its advanced position, as shown in full lines in Fig. 3, it being understood that the said eccentrics are so arranged that their portions of greatest eccentricity are directed toward the free end of said detent when the latter is engaged with the stop projection of the bridge span and is in its advanced position.

Any suitable means may be employed for giving rotative movement to the shaft K as required for operating the locking device; that illustrated consisting of a worm wheel O attached to one end of said shaft, a worm o^1 mounted on a transverse shaft O^1 and a driving shaft P arranged parallel with the shaft K and having at one end a beveled gear wheel p which intermeshes with a beveled gear wheel o on the worm shaft O^1 (Fig. 4). The shaft K may be driven from any suitable source of power adapted to give rotative movement thereto in opposite directions.

The operation of this device is as follows: Assuming the locking detent to be in its locking position, as shown in full lines, Fig. 3, to effect the unlocking of the span the shaft K will be rotated in the direction of the arrow in said Fig. 3, or in the direction in which the said detent is moved to carry its free end away from the stop L. The first effect of the rotation of the shaft is to turn the eccentrics M, M in such a manner as to withdraw the free end of the detent from engagement with the stop L. The said shaft K makes substantially a half rotation for the purpose of effecting the withdrawal of the detent through the action of said eccentrics. After the detent has been released from the stop projection by the action of the eccentrics, the radial arm n which turns with the shaft, strikes the pin j^4 on the detent and thereby throws the same rearwardly or away from the stop projection. In this position, as indicated in dotted lines in Fig. 3, the detent is free from the stop projection and the bridge leaf. A reversal of the rotation of the shaft K operates first to swing said radial arm n downward and away from the pin j^4 on the detent, this permitting the detent to swing by gravity into its locking position where it is arrested by engagement with a stop, shown as formed by a shoulder l on the projection L. Thereafter, the rotation of the shaft operates through the eccentrics to thrust the locking detent to its uppermost position and against the stop projection L on the bridge leaf; the said detent being thereby brought firmly into contact

with the said stop, so as to take up all lost motion in the parts and to hold the bridge leaf firmly in its lowered position.

In practice a locking device embodying my invention may be variously modified from the particular construction shown in the accompanying drawings, and I do not wish to be limited to the specific details illustrated except so far as the same constitute the subject-matter of certain of the appended claims.

I claim as my invention:—

1. In a bascule bridge the combination with a swinging bridge leaf having at the rear of its support an extension which moves downwardly when the leaf is opened, of a locking device comprising a locking detent mounted on the bridge approach adapted for engagement with a downwardly facing stop-shoulder on said extension of the leaf, said detent having oscillatory movement about its lower end to carry its upper end into and out of engagement with said shoulder and also having endwise movement for pressing it upwardly against said shoulder.

2. In a bascule bridge the combination with a swinging bridge leaf having at the rear of its support an extension which moves downwardly when the leaf is opened and which is provided with a downwardly facing stop-shoulder, of a locking device comprising a locking detent adapted to engage said downwardly facing shoulder, said locking detent having oscillatory movement about its lower end to carry its upper end into and out of engagement with said stop-shoulder and also having endwise movement for pressing it against the said shoulder, means adapted to give endwise movement to said detent, and means for giving swinging movement to said detent.

3. In a bascule bridge the combination with a swinging bridge leaf having at the rear of its support an extension which moves downwardly when the leaf is opened and with a downwardly facing stop-shoulder on said extension, a locking device comprising a locking detent having oscillatory movement about its lower end to carry its upper end into and out of engagement with said stop-shoulder and also having endwise movement for pressing it against said stop-shoulder, a rotative shaft mounted on the bridge approach on which said detent is eccentrically mounted and which by its rotary movement gives endwise movement to the detent, and means for giving swinging movement to said detent.

4. In a bascule bridge the combination with a swinging bridge leaf having at the rear of its support an extension which moves downwardly when the leaf is opened and a downwardly facing stop-shoulder on said extension, of a locking device comprising a locking detent having oscillatory movement about its lower end to carry its upper end into and out of engagement with said stop-shoulder and also having endwise movement for pressing it against said stop-shoulder, a rotative, horizontal shaft mounted on the approach structure, said detent being eccentrically mounted on said shaft, which latter by its rotary movement gives endwise movement to the detent, and means operated by the turning of said shaft for giving oscillatory movement to said detent.

5. In a bascule bridge the combination with a swinging bridge leaf having at the rear of its support an extension which moves downwardly when the leaf is opened and a downwardly facing stop-shoulder on said extension, a locking detent having oscillatory movement about its lower end to carry its upper end into and out of engagement with the said stop-shoulder and also having endwise movement for pressing it upwardly against the said stop-shoulder, a fixed bearing on the approach structure, a horizontal rotative shaft supported in said bearing, eccentrics attached to said shaft at opposite sides of the bearing, said swinging detent having two arms which are severally engaged with the said eccentrics, which latter are adapted to give endwise movement to the detent on the turning of said shaft, and means operated by the turning of said shaft for giving oscillatory movement to the upper end of said detent.

6. In a bascule bridge, the combination with a swinging bridge leaf, having at the rear of its support an extension which moves downwardly when the leaf is opened, of a locking device comprising a horizontal rotative shaft mounted on the bridge approach, and an oscillatory and endwise movable locking detent mounted eccentrically on said shaft, and which is given endwise movement by a rotary movement of said shaft, said detent being adapted for engagement at its swinging end with a downwardly facing stop shoulder on the leaf.

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.