

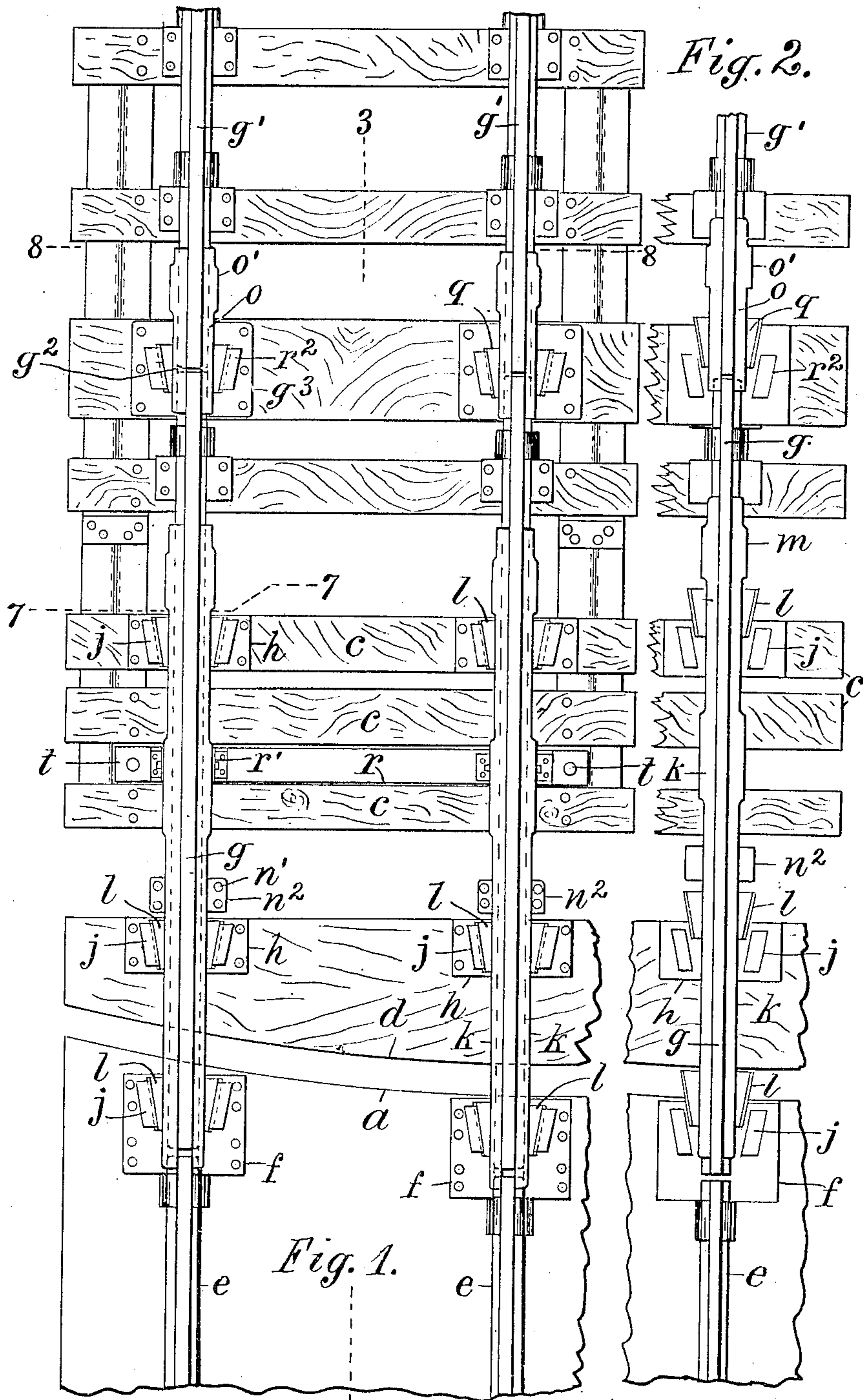
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PATENTED JAN. 7, 1908.

W. R. MERSHON & H. R. LEONARD.  
LOCKING DEVICE FOR DRAWBRIDGE RAIL JOINTS.

APPLICATION FILED MAY 31, 1907.

3 SHEETS—SHEET 1.



Witnesses:  
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J. M. Spaulbaum

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Thomas S. Crane, Atty.

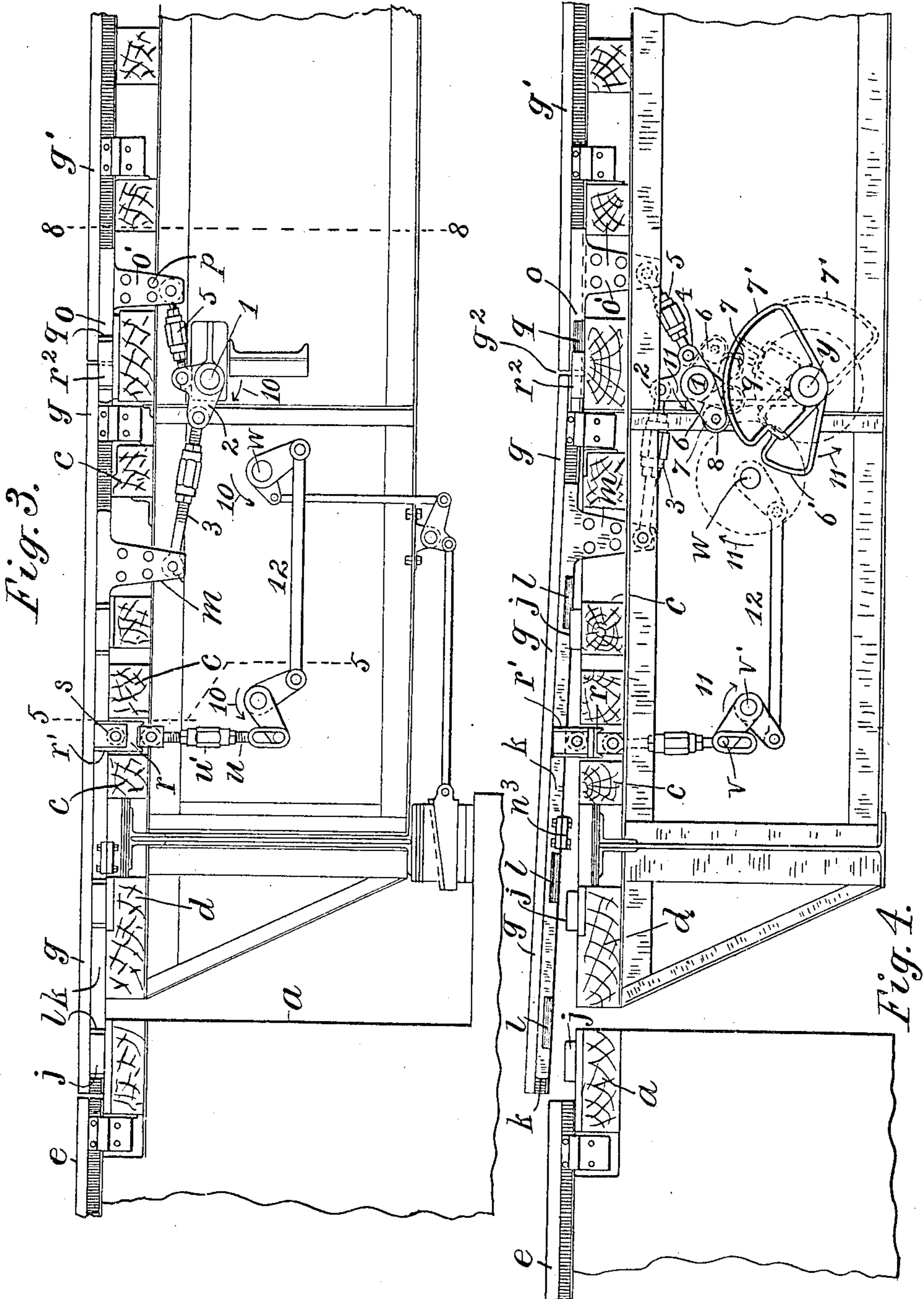
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3 SHEETS—SHEET 2.



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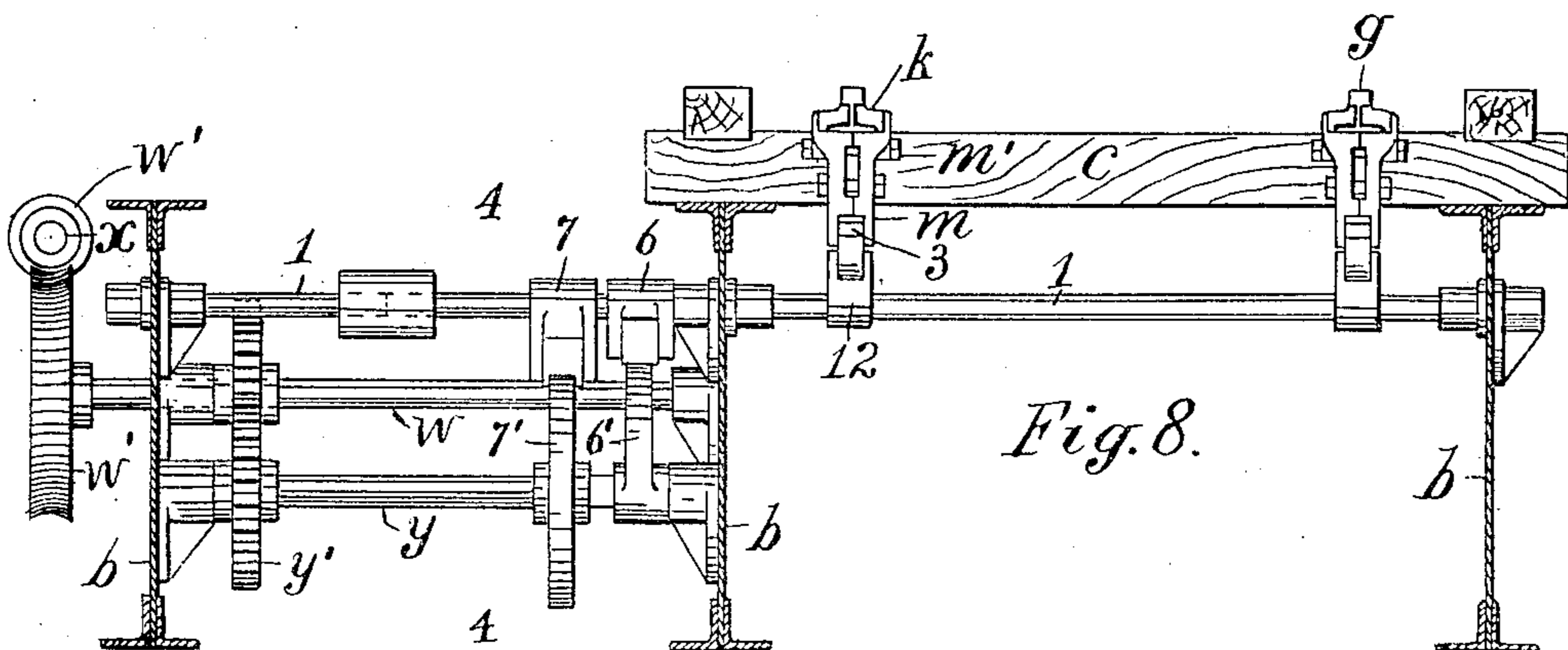
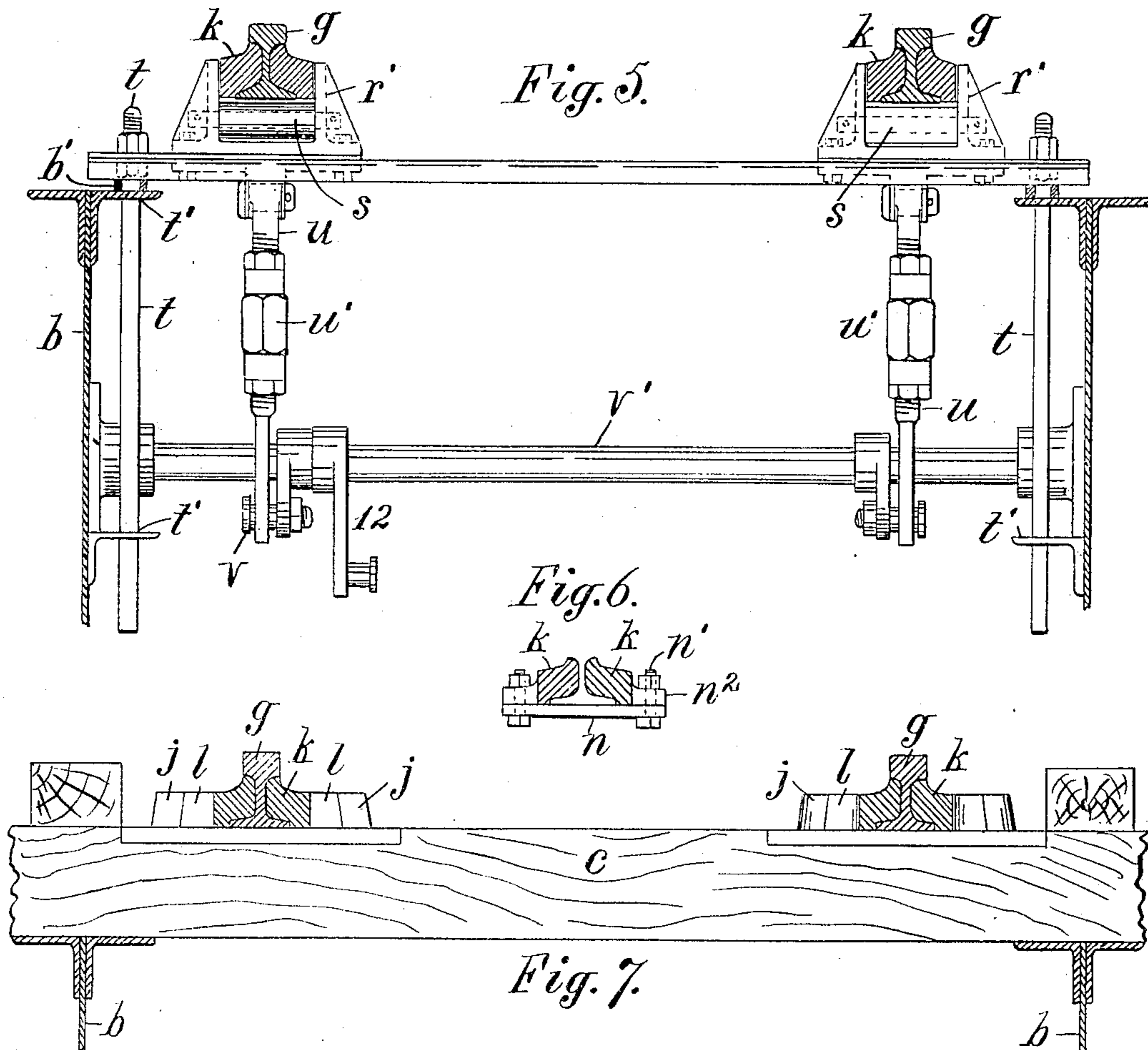
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LOCKING DEVICE FOR DRAWBRIDGE RAIL JOINTS.

APPLICATION FILED MAY 31, 1907.

3 SHEETS—SHEET 3.



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# UNITED STATES PATENT OFFICE.

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## LOCKING DEVICE FOR DRAWBRIDGE RAIL-JOINTS.

No. 876,073.

Specification of Letters Patent.

Patented Jan. 7, 1908.

Application filed May 31, 1907. Serial No. 376,627.

*To all whom it may concern:*

Be it known that we, WILLIAM R. MERSHON, of 113 Hillside avenue, Newark, Essex county, New Jersey, and HENRY R. LEONARD, of 315 Summit avenue, Wayne, Delaware county, Pennsylvania, both citizens of the United States, have invented certain new and useful Improvements in Locking Devices for Drawbridge Rail-Joints, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

The present invention relates to the means for holding in place when a drawbridge is closed the rails upon the bridge which form a joint and a continuous track with the rails upon the landing.

In the present invention, that portion of the rail upon the bridge which extends upon the landing seat and connects with the rail upon the landing, is formed with a hinge or flexible joint at its inner end so that its free end may be raised from the landing seat, and seats similar to the landing seat are placed upon the bridge beneath such hinged rail and all of the seats provided with wedge-jaws, and wedge-bars are fitted movably to the opposite sides of the hinged rail and provided with wedges to engage all of such jaws by a single movement.

The wedge-bars are held in place so as to move upon opposite sides of the rail by means of a shifting arm depended from each, such arms being bolted together, and by means of a cross-bar extended beneath the flange of the rail and bolted to both of the wedge-bars. A similar seat is provided, with wedge-jaws at opposite sides of the hinged joint of the hinged rail, and separate wedges are provided to engage such jaws and lock such hinge firmly when the drawbridge is closed.

The operative mechanism of such drawbridges which is employed to turn the bridge when opening the water-way, and for moving any of the bridge locking mechanism, is commonly actuated by a motor driven by steam or electricity, and such bridge operating mechanism is in the present invention utilized to move the wedge-bars reversibly so that they may be retracted to open the bridge, and again advanced to lock the track and their joints when the bridge is closed.

The rails are hinged upon the drawbridge, to enable their free ends to be lifted clear of

the seat upon the landing, so as to avoid any injurious contact therewith or with the wedge-jaws thereon, and such lifting necessitates the provision of some means for raising them when they are unlocked. Such means is provided herein by a bolster extended beneath the rails, and provided with guides to produce a vertical movement and having cheeks to hold the rails in place and an anti-friction roll beneath each of such rails.

The lifting of the rail breaks all its connections with the drawbridge and necessitates the use of a plurality of seats to support the rail when lowered, and a plurality of clamping devices to secure the rail firmly upon such seats; which are provided in the form of jaws with wedges operated simultaneously as mentioned above.

The invention will be understood by reference to the annexed drawing, in which

Figure 1 shows part of a drawbridge and abutment or landing for a double track, the drawing representing the corner of the bridge and a part of the adjacent landing, with the hinged draw-rail locked to the bridge and the landing seat. Fig. 2 shows one of the hinged rails and the adjacent landing with the wedges retracted to unlock such rail; Fig. 3 is a longitudinal vertical section at the middle line 3—3 of Fig. 1; Fig. 4 is an elevation on line 4—4 in Fig. 8, with dotted lines showing the gears connecting the rock-shaft and cam-shaft; Fig. 5 is a section on line 5—5 in Fig. 3; Fig. 6 is a cross section of the wedge-bars adjacent to the tie-bar; Fig. 7 is an elevation of one of the ties with a cross section of the rail and wedge-bars on line 7—7 in Fig. 1, and Fig. 8 is a vertical transverse section on line 8—8 in Figs. 1 and 3, looking toward the locking and lifting mechanism of the hinged rail.

*a* designates the bridge landing, *b* the girders of the bridge, *c* the ties upon the girders, and *d* the head-piece of the draw curved to clear the landing.

*e* are the ground rails upon the landing, and *f* the seat for the same. The hinged rails *g* are in line with the fixed rails *g'* of the bridge-track, and their joint *g<sup>2</sup>* is supported upon a seat *g<sup>3</sup>*. The end of the rail *g* is held by the fixtures upon this seat in such a manner (as will be hereinafter described) that they serve as a hinge for the rail, so that the forward end of the rail over the landing can be raised

and lowered while the inner end of the rail is held in place by such fixtures. When the drawbridge is closed, the rails *g* are supported upon seats *h* on the drawbridge and their junction with the ground rails *e* is supported upon the seat *f* upon the landing. The seats *h* and *f* have sloping wedge-jaws *j* which are preferably undercut or dovetailed, as shown in Fig. 7, and wedge-bars *k* are fitted to the channels at opposite sides of the hinged rail *g*, and extend between the jaws of the seats *h* and *f*, and are provided with wedges *l* fitted to such jaws.

The upper sides of the wedge-bars, as shown in Fig. 7, lie sufficiently below the head of the rail to clear the flanges of the car-wheels, and these bars have depending arms *m* which are clamped together by bolts *m'*, as shown in Figs. 3 and 8, in such manner as to hold the wedge-bars movably in the channels. Near their opposite ends, the wedge-bars are secured together by a cross-plate or tie *n* which is clamped by bolts *n'* to lugs *n<sup>2</sup>* upon the wedge-bars, thus holding the wedge-bars spaced apart in such manner as to retain them securely in the channels of the rails while permitting them to move longitudinally.

When the draw is closed, as in Fig. 1, the movement of the wedge-bars *k* serves to force the wedges simultaneously into the seats upon the draw and into the seat *f* upon the landing, thus locking the rail firmly at numerous points, and locking the ground-rail and the hinged rail securely in alinement upon the seat *f*. Similar wedge-bars, but carrying only a single wedge, are shown at *o* in Figs. 1, 3 and 4 clamped together by arms *o'* and bolts *p* so as to be movable in the channels of the rail, and such wedge-bars carry wedges *q* fitted to jaws *r* upon the seat *g<sup>3</sup>*. The wedge-bars slide past the joint *g<sup>2</sup>* of the fixed and hinged rails *g'* and *g*, and operate when the draw is closed to hold such joint firmly in alinement and to lock it rigidly to the seat *g<sup>3</sup>*. When the arm *o'* is retracted and the wedges drawn back, as shown in Figs. 2 and 4, the ends of the wedge-bars still overlap the rear end of the hinged rail, as shown in Fig. 2, and hold the same down upon the seat *g<sup>3</sup>*, but permitting the forward end of the rail over the seat *f* to be lifted. When the draw is to be opened, the wedge-bars *o* are first retracted, to loosen the joint the hinged rail; and the wedge-bars upon of such hinged rail are then retracted to unlock the rail and permit its elevation.

The means for retracting the wedge-bars will be described hereinafter.

The means for lifting the rail consists, as shown in Figs. 1, 4 and 5, of a bolster *r* extended crosswise beneath the hinged rails about the middle of their length, and carrying vertical cheeks *r'* fitted to the outer sides of the wedge-bars. Rolls *s* are journaled

between the cheeks directly beneath the rails, which are thus held from lateral movement by the cheeks, while the rolls prevent friction during the lifting movement. The bolsters have vertical bars *t* extended downward from their opposite ends and fitted to guides *t'* upon the girders of the bridge, and connecting rods *u* having expansion joints *u'* are extended downward from the lower side of the bolster and actuated to lift the bolster by cranks *v* upon a lifter-shaft *v'*.

A rock-shaft *w* is shown in Figs. 3, 4 and 8, journaled in the girders of the bridge and connected by a worm and worm-wheel *w'* with a motor-shaft *x*. Such shaft is in practice actuated by a suitable motor, and the rotations of the motor in reverse directions, are controlled by an operator by the use of suitable signals, as is common upon drawbridges, so as to turn the drawbridge in reverse directions when opening and closing the same. Such reverse movement of the motor-shaft operates to oscillate the shaft *w*, and connections are shown herein with such shaft for actuating the wedge-bars and lifting the hinged rail when required. Such connections secure the retraction of the wedges from their respective jaws, and the lifting of the hinged rail from the landing seat *f* before the draw is opened, and hold the wedges and hinged rail in such position until the draw is again closed. To shift the wedges, a cam-shaft *y* is shown in Figs. 4 and 8, connected by gears *y'* with the rock-shaft *w*, such gears being indicated by dotted lines in Fig. 4, as the section plane 4—4 in Fig. 8 does not include such gears. A crank-shaft is shown above such cam-shaft and has a crank 2 connected by link 3 with the arm *m* for the wedge-bar *k*, and it has also a crank 4 connected by link 5 with the arm *o'* upon the wedge-bars *o*.

The cranks 2 and 4 are shown in Fig. 3 turned to advance the wedge-bars and lock the rails *e*, *g* and *g'* upon their seats, as shown in Fig. 1, the crank 2 in such case being upon its dead center, and thus producing but little movement upon the wedge-bars *k*, when the crank-shaft is first reversed or turned to retract the wedges. The crank 4 in the same case is at right angles to its link so as to operate rapidly upon the wedge-bars *o* when the crank-shaft is reversed, and the hinge-joint of the rail *g* is thus first unlocked and the wedges upon the movable portion of the rail then unlocked to permit the lifting of the rail.

With the proportions shown in the drawing, the crank-shaft is oscillated through about 80 degrees of arc, and this oscillation is effected by two roll-arms 6 and 7 carrying rolls 8 and 9 to bear upon the surfaces of cams 6' and 7' on the cam-shaft *y*. The motion of the parts when advancing the wedges is shown by the arrows 10 in Fig. 3,

while the motion of the parts for retracting the wedges is shown by the arrows 11 in Fig. 4. The roll-arms 6 and 7 are mounted at different points upon the crank-shaft, as indicated in Fig. 4, where the cams and arms are shown in a reverse position from that in Fig. 3, and the arms are so secured upon the crank-shaft that the motion of the cams 6' and 7', in opposite directions operates alternately upon the roll-arms to oscillate the crank-shaft as required. The roll-arms are shown in full lines in Fig. 4 in the position required to retract the wedges, while they are also shown in dotted lines in the position required to advance the wedges. The crank-shaft 1, the cam-shaft *y* and the rock-shaft *w* all oscillate simultaneously as well as the lifter-shaft *v'*, which is connected with the rock-shaft by cranks and a link 12, and the connections *u* are formed with slots in the lower end in which the pins of the cranks *v* are fitted to move, so that only the final movement of the lifter-shaft operates upon the bolster *r*, after the wedges are all retracted. The operating mechanism for the bridge, represented by the motor shaft *x* thus operates three parts successively, namely, the wedges at the hinge joint of the rail *g*, the wedges which operate upon the seats *h* and *f*, and the bolster which lifts the hinged rails before turning the draw. The lifting of the rail clear of the jaws *j*, as shown in Fig. 4, the two rails *g* being prevented from lateral movement during such lifting by the cheeks *r'* upon the bolster *r*.

A coupling is shown upon the shaft in Fig. 8 at the right hand side of the gear-wheels *y'*, and the joint of the shaft within such coupling represents, in the construction shown, the longitudinal center line of a drawbridge; of which only one track is shown, supported upon the girders *b—b* at the right hand side of such coupling. The shaft is shown extended across the face of the worm-wheel *w'*, as would be the case if used to limit the rails upon a track at the left hand side of the drawbridge, the oscillation of the shaft by the roll-arms 6 and 7 operating to raise simultaneously the rails *g* of the tracks at both sides of the drawbridge.

The arrangement of the various parts may be modified to suit different drawbridges, without departing from the invention claimed herein.

Having thus set forth the nature of the invention what is claimed herein is:

1. A rail locking device comprising a rail seat with sloping jaws upon the same, a rail fitted to the seat between the jaws, and a pair of wedges fitted movably to the jaws and rail and operated simultaneously to clamp the rail upon the seat between the jaws.

2. A rail locking device comprising a series of seats beneath the rail, such seats having wedge-jaws at opposite sides of the rail, a

pair of wedge-bars fitted movably to the opposite sides of the rail and having wedges fitted to the jaws and operated simultaneously to clamp the rail upon all the seats between the jaws.

3. A rail joint locking device having a seat with the ends of two rails seated thereon and dovetail jaws at opposite sides of the rail, a pair of wedge-bars fitted movably to the opposite sides of the rails and having dovetail wedges fitted to the jaws, the wedge-bars overlapping the joint of the rails when the wedges are in contact with the jaws, and means for simultaneously moving the wedge-bars upon the rail.

4. A rail joint locking device for drawbridges, having a rail-seat upon the landing and rail-seats upon the drawbridge, such seats provided with wedge-jaws, rails upon the landing and upon the drawbridge with a separable joint upon the landing seat, a series of wedges movable upon the said rail and fitted to the said seats and connected to operate together, and means for shifting the series of wedges to lock the rail simultaneously upon the bridge and the landing.

5. A rail joint locking device for drawbridges, having a rail-seat upon the landing and rail-seats upon the drawbridge, such seats provided with wedge jaws, rails upon the landing and upon the drawbridge with a separable joint upon the landing seat, a series of wedges movable upon the said rail and fitted to the sides of the rails and to the said jaws, means for shifting the series of wedges to lock the rail upon the bridge and landing, and means for retracting the wedges and moving the same with the bridge-rail, clear from the seat upon the landing, before moving the bridge.

6. A rail joint locking device for drawbridges having a rail-seat upon the landing and rail-seats upon the drawbridge, such seats provided with dovetail wedge jaws, rails upon the landing and upon the drawbridge with a separable joint upon the landing seat, a series of dovetail wedges fitted to the sides of the rails and to the said jaws, means for shifting the series of wedges to lock the rail simultaneously upon the bridge and landing, and means connected with the drawbridge operating mechanism for retracting the series of wedges and lifting the wedges and the bridge-rail clear from the landing seat before moving the bridge.

7. A rail joint locking device comprising a seat for the rail with wedge jaws at opposite sides of the seat, wedge-bars fitted movably to the channels at opposite sides of the rail and provided with wedges fitted to the said jaws, and a tie-bar extended across beneath the rail to hold the said wedge-bars movably upon the rail.

8. A rail joint locking device for drawbridges, having a rail-seat upon the landing

and rail-seats upon the drawbridge, such seats having wedge-jaws thereon, a rail hinged upon the bridge and extended upon the landing seat and arranged to lift therefrom, a series of wedges movable upon the said rail and fitted to the jaws upon the seats, a cam-shaft beneath the rails with connections for moving the series of wedges reversibly to lock and unlock the rail, and independent connections for lifting the free end of the hinged rail when unlocked to clear the seat upon the landing, and means connected with the drawbridge operating mechanism for oscillating such cam-shaft.

9. A rail joint locking device for drawbridges, having a rail-seat upon the landing and rail-seats upon the drawbridge, such seats having wedge jaws thereon, a rail hinged upon the bridge and extended upon the landing seat and arranged to lift therefrom, a series of wedges movable upon the said rail and fitted to the jaws upon the seats, a separate seat with wedge jaws adjacent to the hinged joint of the hinged rail and a wedge fitted movably to such jaws for locking the joint of the hinged rail, a rock-shaft oscillated by the bridge-operating mechanism, a crank-shaft actuated by the rock-shaft, and connections from such crank-shaft for first loosening the wedge at the hinged joint and then shifting the remaining series of wedges simultaneously to unlock the hinged rail.

10. A rail joint locking device for drawbridges, having a rail-seat upon the landing and rail-seats upon the drawbridge, such seats having wedge-jaws thereon, a rail hinged upon the bridge and extended upon the landing seat and arranged to lift therefrom, a series of wedges movable upon the said rail and fitted to the jaws upon the seats, a rock-shaft upon the bridge with connections for lifting the hinged rail when unlocked, and a crank-shaft operated by the rock-shaft, with connections for shifting the series of wedges simultaneously to lock and unlock the hinged rail.

11. A rail joint locking device for drawbridges, having a rail-seat upon the landing and rail-seats upon the drawbridge, such seats provided with wedge-jaws, rails upon the landing and upon the drawbridge with a separable joint upon the landing seat, a series

of wedges movable upon the said rails and fitted to the said seats, an adjustable main end wedge movable with the bridge beneath the end of the same for seating the bridge upon its abutment, a rock-shaft upon the bridge with connections to such main end wedge and a motor shaft for actuating such rock-shaft and other bridge operating mechanism, a crank-shaft actuated by the rock-shaft, and connections from such crank-shaft for shifting the series of wedges to lock and unlock the hinged rail.

12. A joint locking device for a pair of track-rails upon a drawbridge, having for each track-rail a rail-seat upon the landing and seats upon the bridge with wedge-jaws upon said seats, the rails upon the bridge being hinged and extended upon the landing seat and arranged to lift therefrom, a series of wedges movable upon each of the hinged rails and fitted to the said jaws, a bolster extended transversely beneath the hinged rails and carrying cheeks to guide the rails, means for retracting the wedges from the jaws, and means for lifting the bolster to rest the free ends of the rails from the landing seat before turning the bridge.

13. A joint locking device for a pair of track-rails upon a drawbridge, having for each track-rail a rail-seat upon the landing and seats upon the bridge with wedge-jaws upon said seats, the rails upon the bridge being hinged and extended upon the landing seat and arranged to lift therefrom, a series of wedges movable upon each of the hinged rails and fitted to the said jaws, a bolster extended transversely beneath the hinged rails and carrying cheeks to guide the rails with anti-friction rolls between the cheeks to support the rails, vertical guide-rods and guides for guiding the movement of the bolster, means for retracting the wedges from the jaws, and means for lifting the bolster to raise the free ends of the rails from the landing seat before turning the bridge.

In testimony whereof we have hereunto set our hands in the presence of two subscribing witnesses.

WILLIAM R. MERSHON.  
HENRY R. LEONARD.

Witnesses:

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CYRUS C. CUNIER.