J. COOPERSTOCK.

TRAIN INTERLOCKER AND CROSS BRIDGE.

APPLICATION FILED MAY 11, 1909.

938,980.

Patented Nov. 2, 1909.

4 SHEETS—SHEET 1.

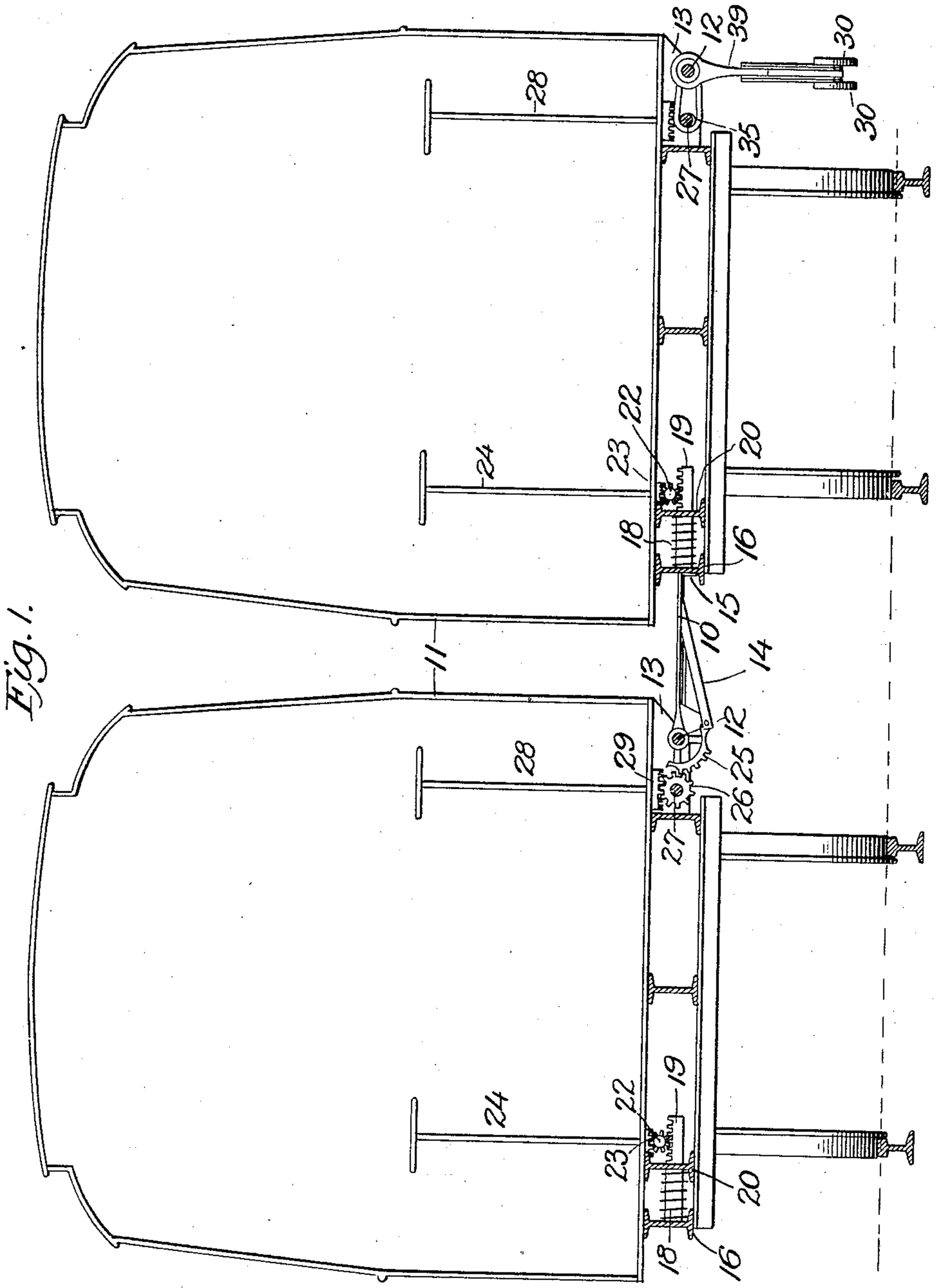

Fig. 1.

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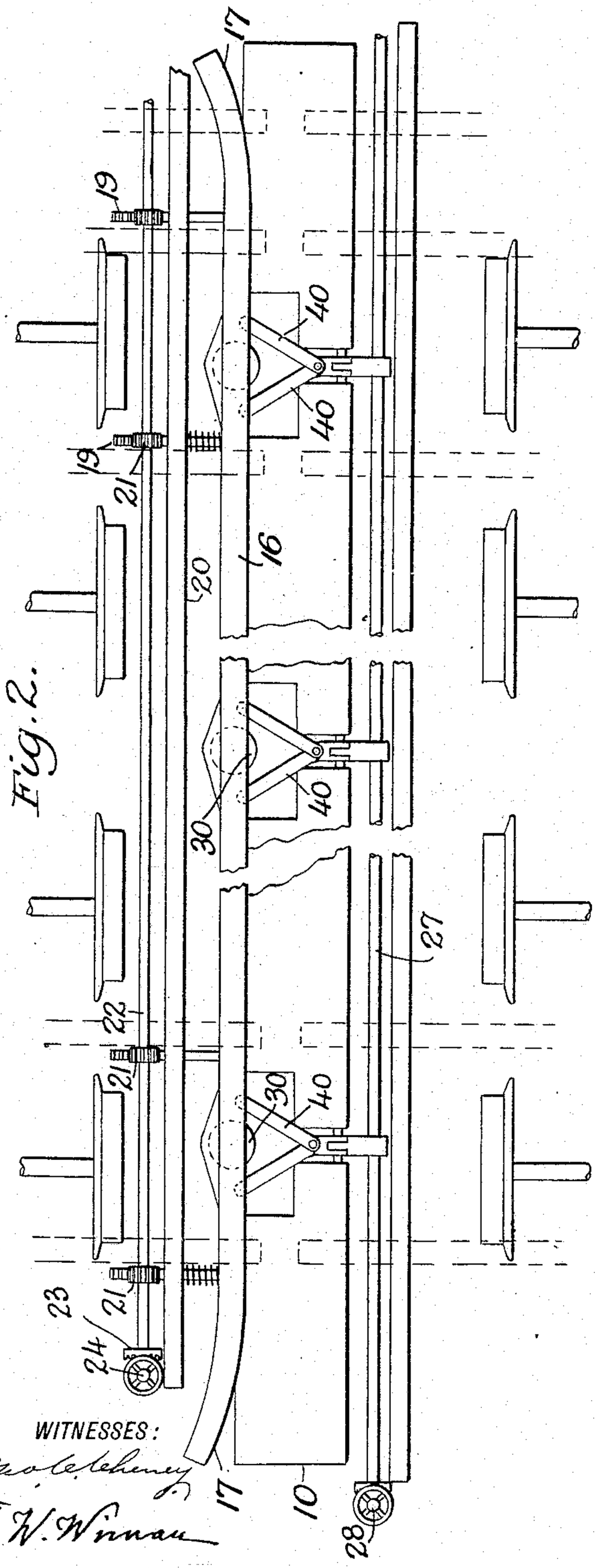

Fig. 2.

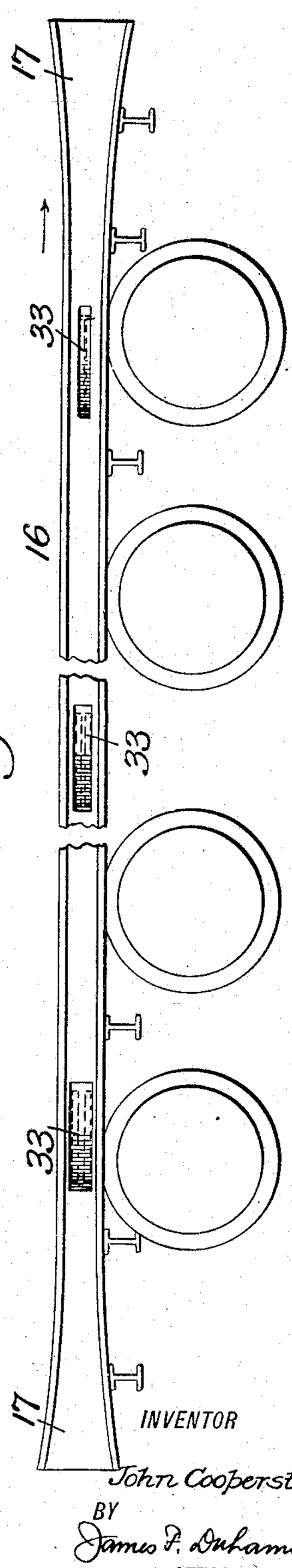

Fig. 3.

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4 SHEETS—SHEET 3.

Fig. 4.

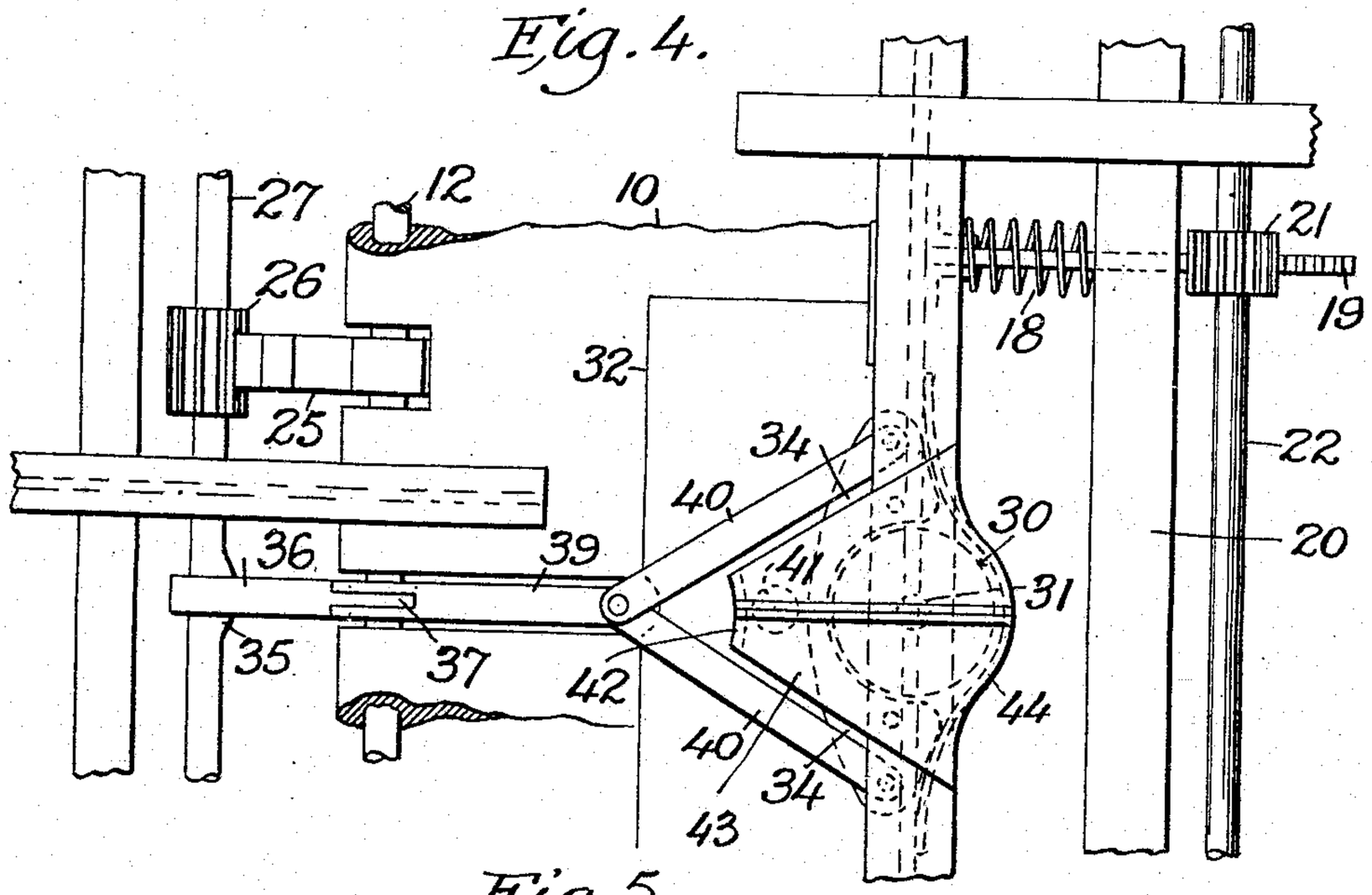


Fig. 5.

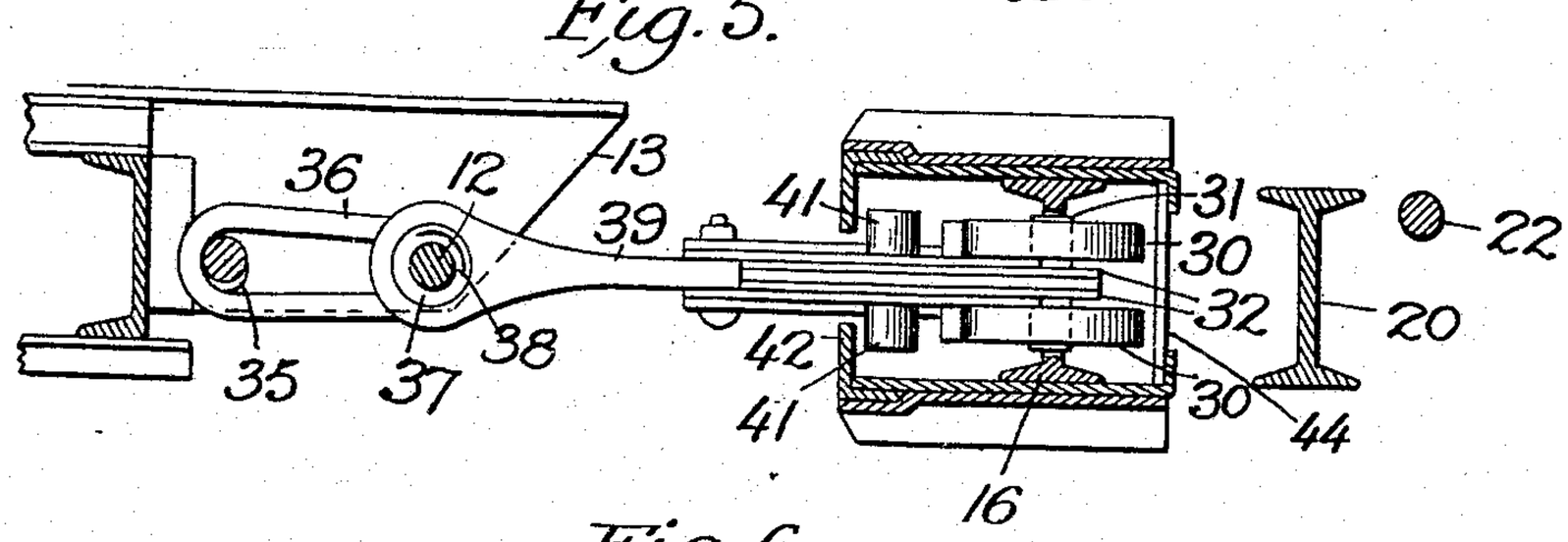
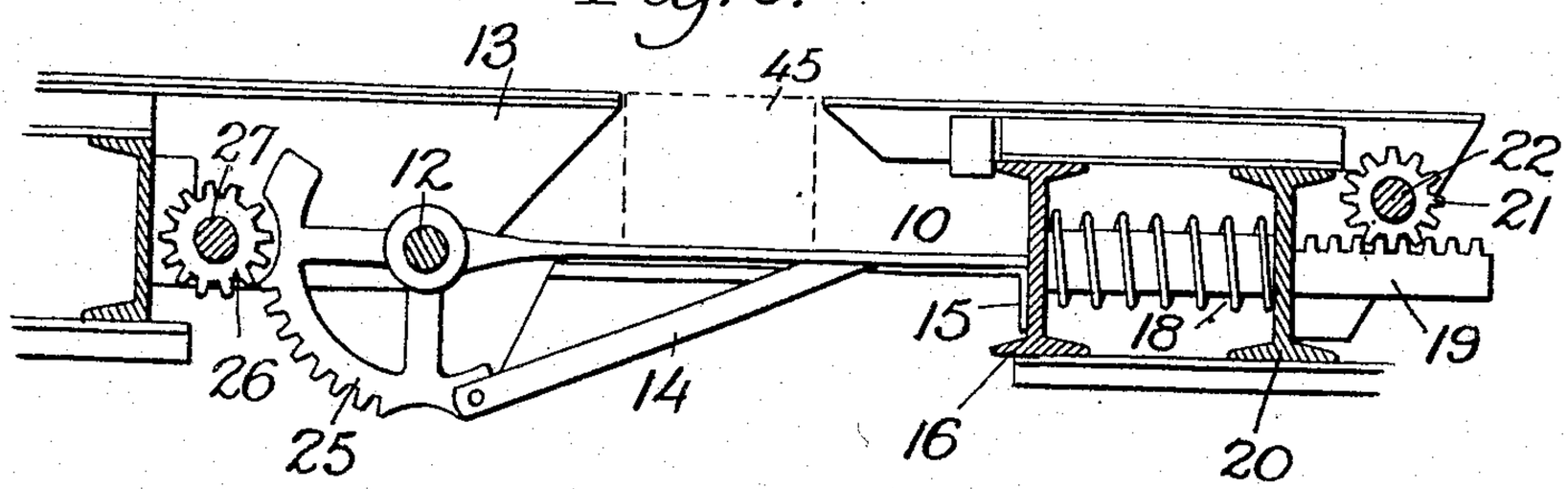


Fig. 6.



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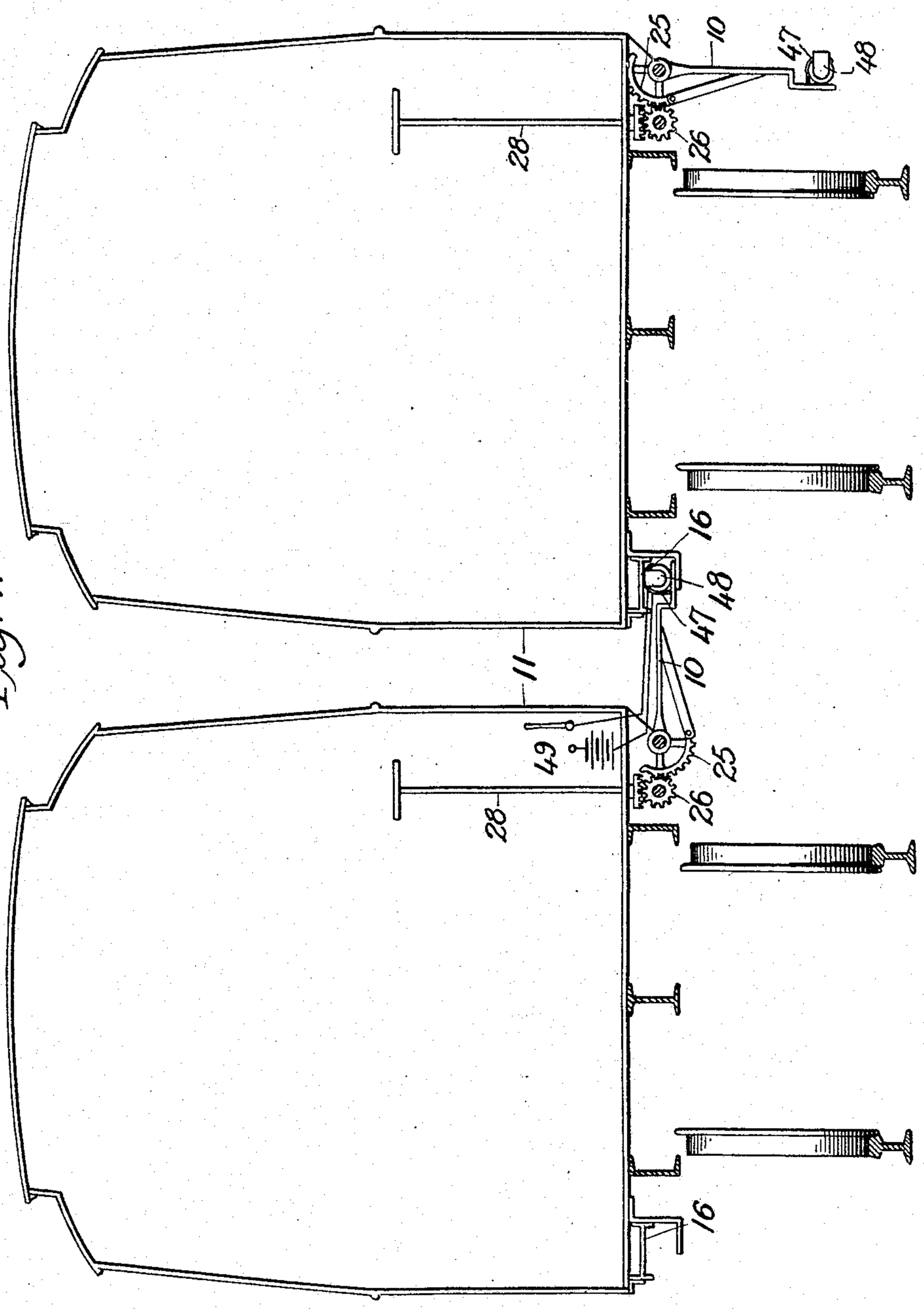

Fig. 7.

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UNITED STATES PATENT OFFICE.

JOHN COOPERSTOCK, OF NEW YORK, N. Y.

TRAIN INTERLOCKER AND CROSS-BRIDGE.

938,980. Specification of Letters Patent. **Patented Nov. 2, 1909.**

Application filed May 11, 1909. Serial No. 495,249.

To all whom it may concern:

Be it known that I, JOHN COOPERSTOCK, a citizen of the United States, and resident of the city of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Train Interlockers and Cross-Bridges, of which the following is a specification.

This invention relates to train interlockers and cross bridges which are applied to one or more cars of a train or trains that are adapted to travel at different rates of speed on parallel and adjacent tracks so that the device may connect and lock two trains on these tracks so that passengers may be transferred from one train to the other while the trains are moving.

This device is especially applicable to roads such as subways and elevated structures in large cities and on which it is the practice to run local and express trains but where it is necessary for the local trains to make more stops than the express. Under these circumstances it is found desirable to shift passengers from one to the other so that those on the express, when nearing a station at which the local only stops to transfer to an express or vice-versa; when parties enter a local train at many of the local stations and their train is under way it will be overtaken by an express train. This improved interlocking means may then be put in operation while the two trains are run at nearly the same rate of speed and then a connection is made by a bridge or similar means so that the necessary exchange may be made. These and other objects and details of the invention will be more fully explained in the following specification, set forth in the claims and illustrated in the accompanying drawings, wherein like reference characters are used to designate the same parts in the various views:

Figure 1 is a cross sectional view of two trains of cars with the improved device applied thereto. Fig. 2 is a plan view of so much of two trains as is necessary to illustrate the invention. Fig. 3 is a side view of one of the cars. Fig. 4 is a plan view of one of the locks. Fig. 5 is a sectional view through a lock. Fig. 6 is a sectional view through the bridge. Fig. 7 shows a modified construction where electrical is substituted for the mechanical locking means.

The device is adapted to be applied to the sides of cars, the bridge and lock to one side while the receptacles and engaging means for the locks are on the other side of the cars so that they are always in position for the connection and locking operation.

For convenience of illustration and description the bridge (10) is shown as being on the right hand side of the cars (11) and carried by a shaft (12) hung from brackets (13) at that side of the car. The bridge is of sheet metal with the necessary supports and braces (14) on its under side and a flange (15) at its outer end. Normally the bridge hangs substantially vertically from its shaft (12); but in the drawings it is shown swung into its operative position and locked there by the sliding channel beam (16) of the adjacent car, the bridge, when its car approaches the opposite car, being thrown to its horizontal position as shown in Fig. 2 when it enters the channel of the beam through its curved ends (17). The beam (16) is forced outward to make contact with the flange (15) by means of springs (18) on toothed studs (19) projecting inward from the opposite side of the beam, the springs being resisted by the stationary beams (20) while the studs, (19) which are provided at desired intervals are retracted by means of pinions (21) on a shaft (22) running the length of the car and rotated by a pinion (23) in the down end of the hand wheel shaft (24). The bridge is elevated by means of the segment (25) on the shaft (12) and operated by the pinion (26) on a shaft (27) which is actuated by the shaft and handwheel (28) with pinion (29) to gear with a similar pinion on the shaft. The locking is done by means of rollers (30) carried on studs (31) on each side of the bridge which is reinforced at this point by plates (32) and these rollers ride up the curved ends of the movable beam (16) and enter pockets (33) in this beam, as shown in Fig. 3, these pockets are of different widths and the rollers are set at different distances apart as shown by dotted lines so that as, for instance, the car with the pockets moved ahead of the adjacent car the widest rollers will pass the first two pockets before reaching the last pocket in which they lodge. The first and second set of rollers will also fit and lodge in the first and second pockets when the movable beam is forced outward by the pinion and studs and the two cars and their trains are thereby locked together.

In order to induce friction for equalizing

speed and also to effectually lock the rollers against rotation while occupying the pockets, brakes (34) are pivoted to the bridge and as the shaft (27) is turned, a cam face (35) acts against the inner face of the link (36) with a hub (37) at its outer end and lost movement slot (38) so that it is supported by but independent of the shaft (12) and connected with a second link (39) carrying the bars (40) which connect it with the brakes (34) and block the rollers as they are located in the pockets when the bridge is brought to its elevated position at the same time when the rollers are to be released the first movement of the shaft (27) releases the brakes, then the beam (16) is carried back permitting the rollers to move from their pockets, and finally, the bridge to drop to its hanging position.

The location of the rollers, (30) in their pockets, is more effectually insured by small rollers (41) which ride into the inclined faces (42) of the plates (43) that are secured to the beams (16) above and below each pocket. The pockets are braced and housed as shown in Figs. 4 and 5 and are formed by opening the web of the beam and providing a rear wall (44) to form a recess conforming with the rollers (30).

In case that it is found advisable a filling piece (45) shown in dotted lines in Fig. 6 may be provided to form a crossing flush with each car floor or platform.

The modified form shown in Fig. 7 employs the same bridge (10) the segment (25) and its pinion (26) to elevate same, a channeled beam (16) receives the free end of the bridge which is provided with a plurality of electro-magnets (47) whose pole pieces (48) are adjacent to the horizontal wall of the beam (16) and when the trains arrive in the proper position beside each other a switch (49) throws the current through one or all of the electro-magnets and the attraction will cause a locking action between the magnetic pole piece and the wall of the beam (16) and hold the trains together.

It is obvious that other modified forms of the locking means may be varied as the occasion may demand and the scope of the claims may permit.

What I claim as new and desire to secure by Letters Patent is:—

1. In a train interlocker and bridge, the combination with cars of means hanging below the floors of the cars for bridging same while moving on parallel tracks and means for retaining the bridge to lock the two cars together.

2. In a train interlocker and bridges, the combination with cars of means hung below the floor on one side of same for bridging the space between adjacent cars running on adjacent tracks and locking means on the adjacent side of the running cars.

3. In a train interlocker and bridges, the combination with cars of hanging bridges beneath the floors on one side of same, means for elevating the bridges and means on the opposite side for locking the bridges while the cars are running on adjacent parallel tracks.

4. In a train interlocker and bridges, the combination with cars, of pivotally hanging bridges on one side of same, locking means on the other side, means for swinging the bridges to the elevated position and means for releasing the bridges.

5. In a train interlocker and bridges, the combination with cars of a pivotally hanging bridge at one side, a shifting beam to support a bridge at the other side, means for elevating the bridge and means for shifting the beam to release the bridge.

6. In a train interlocker and bridges, the combination with cars, of a shaft at the side of same, a bridge carried by the shaft, means for operating the shaft to elevate said bridge, a shifting channel beam to support the outer end of the bridge and means for shifting the beam to release the bridge.

7. In a train interlocker and bridges, the combination with cars, of swinging bridges carried by a shaft on one side of a car, means for swinging the bridges, a shifting channel beam on the other side of said car having pockets, rollers on the bridges to engage the pockets, and means for shifting the beam to release the rollers from the pockets.

8. In a train interlocker and bridge, the combination with cars, of a bridge at one side of same, a shaft carrying the bridge, rollers in the outer end of the bridge, means for swinging the bridge to a horizontal position, a shifting channel beam with pockets for the rollers and means for shifting the beam for the reception of the bridge and rollers.

9. In a train interlocker and bridge, the combination with cars, of swinging bridges, a shaft along one side of a car, means for rotating the shaft to elevate the bridges, a channel beam with different widths on the edge of the opposite side of said car and having pockets, rollers at the outer end of the bridges to fit the pockets and means for shifting the beam to release the rollers.

10. In a train interlocker and bridges, the combination with a car, of a shaft in brackets on one side of the car, a bridge carried by the shaft, a segment on the shaft, means for turning the segment and shaft, rollers of successively different sizes at the edge of the bridge, brakes for the rollers, means connected with the segment turning means for applying the brakes, a channel beam with successively different sizes of pockets for the rollers, springs to return the beam to its normal position, toothed studs on the beam,

and pinions with actuating means meshing with the studs to withdraw the beam and release the rollers.

11. In a train interlocker and bridges, the combination with cars, which cars are provided on one side with channel beams and sockets; of hanging bridges beneath the other side of the cars and adapted to be swung upward to enter the channel beams and equalize the speed of the trains, and means for elevating the bridges.

12. In a train interlocker and bridges, the combination with cars having socketed channel beams at one side, of bridges hung on shafts beneath the opposite sides of the cars, and electrical means at the outer ends of the bridges for locking the same within the channel beams so that the speed of the cars is equalized.

Signed at the city of New York, in the county of New York, and State of New York, this 10th day of May A. D. 1909.

JOHN COOPERSTOCK.

Witnesses:

LOUIS S. POSNER,

MAURICE COOPER.