

Dec. 24, 1929.

A. E. ZOLLER ET AL

1,740,937

RAILROAD PLATFORM BRIDGE

Filed June 5, 1928

3 Sheets-Sheet 1

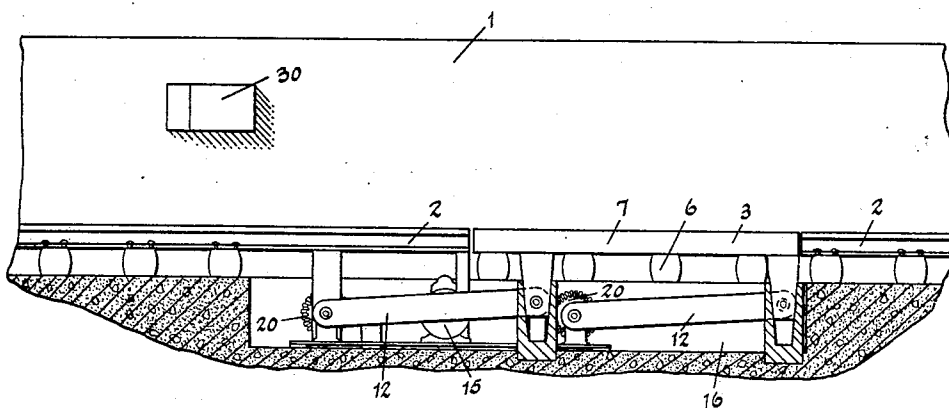


Fig 2

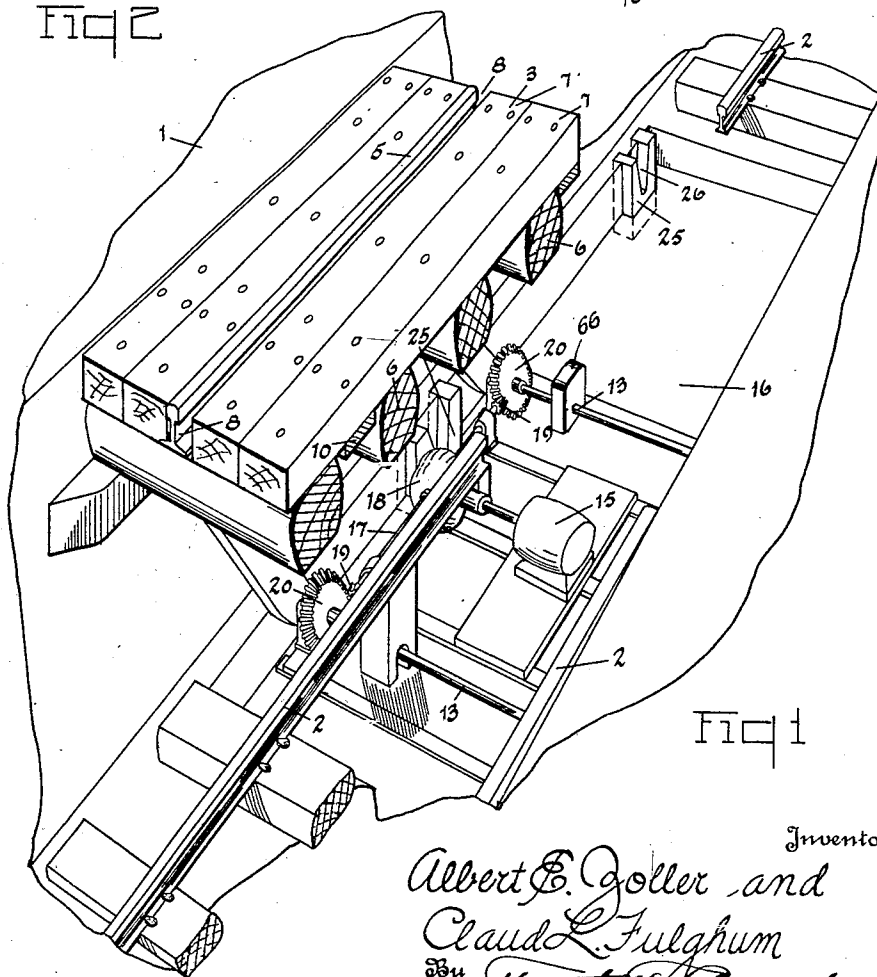


Fig 1

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3 Sheets-Sheet 2

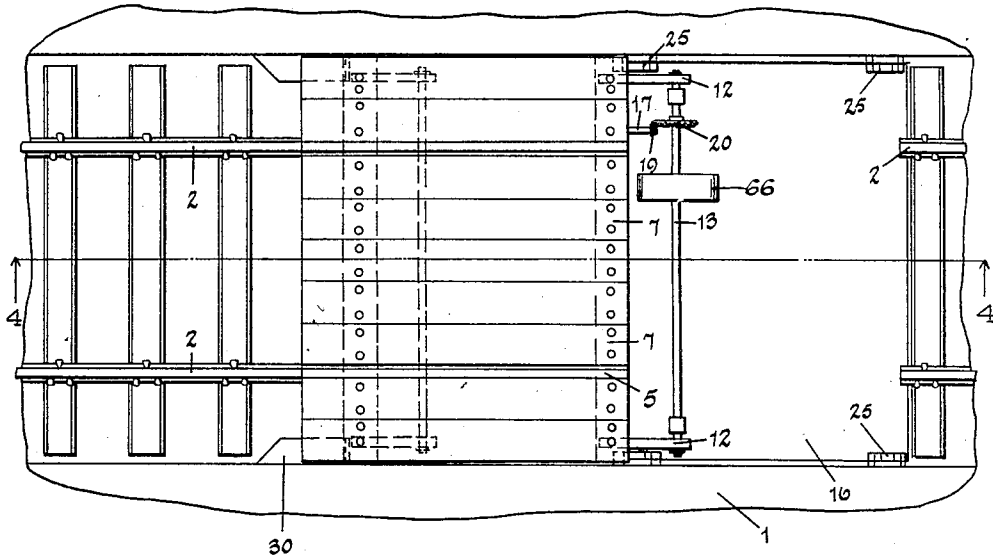


Fig 3

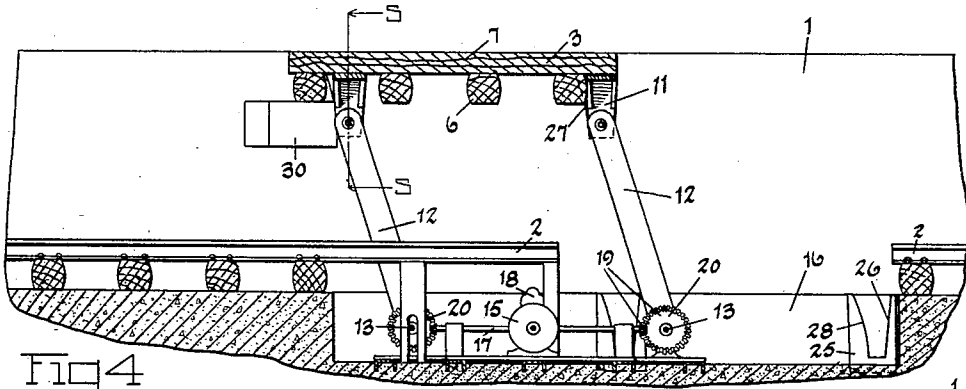


Fig 4

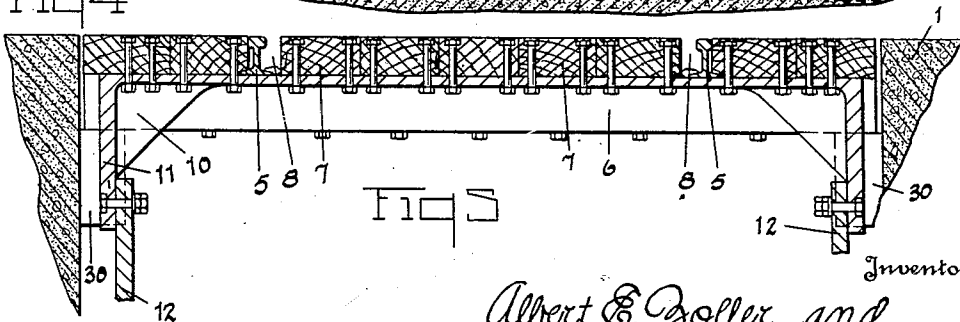


Fig 5

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3 Sheets-Sheet 3

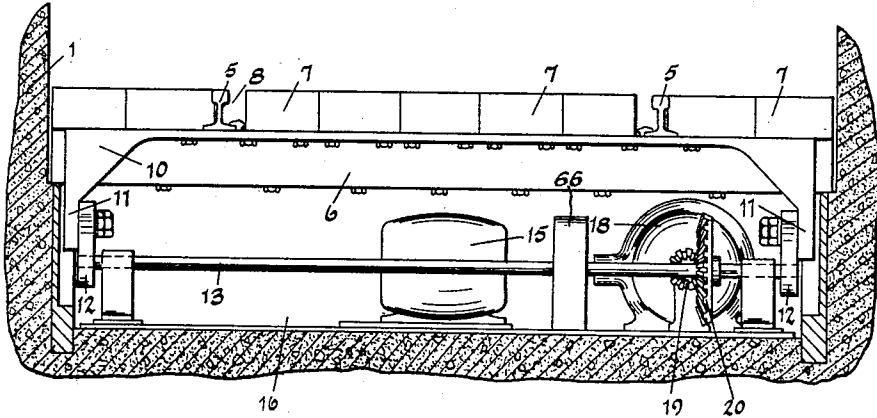


Fig 6

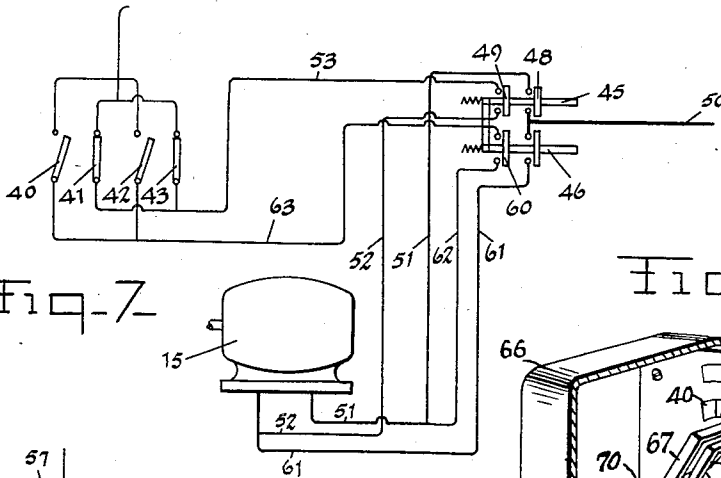


Fig-7

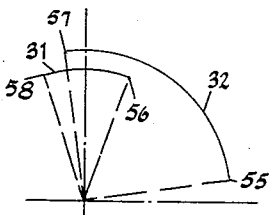


Fig 8

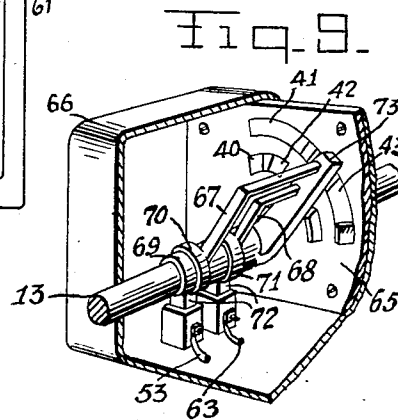


Fig-9

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UNITED STATES PATENT OFFICE

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RAILROAD-PLATFORM BRIDGE

Application filed June 5, 1928. Serial No. 282,963.

Our invention has for its object to provide a bridge for connecting freight platforms commonly located on opposite sides of railroad tracks or between spurs of tracks. The invention provides a bridge member that may be readily placed in or removed from bridging position between the platforms and, when removed from bridging position, may be so located that it will not in any wise interfere with the loading and unloading of freight, notwithstanding any position in which the car doors may be located with reference to any one or more of adjoining platforms. The invention thus provides a bridge and its necessary supporting structure and operating mechanism that in no wise produces an obstruction or an impediment to the movement of freight on the platforms.

As is well known in freight houses and in freight yards, particularly in freight stations, where freight cars are loaded and unloaded, platforms are formed having heights which are substantially the same as the height of the floors of the freight cars to enable ready entrance into the freight cars and movement of the freight from the platforms into the cars. Where a large area is thus provided for trackage and platforms, as in freight houses, it is, as is well known, inconvenient to go from one platform to another and, moreover, it is often very desirable to transfer freight from one platform to another. In freight stations where bridges are not provided, it has been necessary to form transfer areas located at the ends of the spurs and in passing from one platform to another, it has been heretofore customary to walk around one or more ends of the spurs in order to get from one platform to another, rather than climbing down to the tracks and going across the tracks to a particular platform, or, to carry the freight around the ends of the spurs in order to transfer the freight from one platform to a desired point on another platform. Railroad platform bridges have heretofore been used but such bridges require a superstructure for their manipulation, with the result that such superstructure is frequently an obstruction to loading of the cars. Even though particular care is used in locat-

ing cars, which, however, is rarely done, yet, since the cars having different lengths, one or more of the car doors will be invariably located in proximity to one or more of the super-bridge structures, which forms an impediment in the loading of the particular car.

By our invention, we have provided a platform bridge having a section of the track and which is raised from the track bed to the level of the platforms by mechanisms located below the level of the platform. Preferably, the bridge is electrically operated to raise and lower the bridges and suitable track signaling or look-out means may be provided for indicating clearance or obstruction of the tracks when the bridges are lowered or raised, as the case may be. Also, by our invention, we have provided suitable interlocking mechanism whereby the platform is securely locked in position when it is lowered and also locked in position when it is raised.

The invention may be contained in structures of different forms and, to illustrate a practical application of the invention, we have selected a platform bridge as an example of the various forms of structures that embody our invention and shall describe it hereinafter. The platform bridge selected for purposes of illustration is shown in the accompanying drawings.

Fig. 1 is a perspective view of the mechanism, a part of the bridge being shown as broken away in order to illustrate the mechanism located in the pit beneath the tracks. Fig. 2 is a view of a longitudinal section of the pit and shows a side view of the mechanism when the bridge is lowered. Fig. 3 is a top view of the bridge when raised. Fig. 4 is a longitudinal section of the mechanism showing the bridge in its raised position. Fig. 5 illustrates a view of a transverse section taken along the plane of the line 5-5 indicated in Fig. 4. Fig. 6 illustrates an end view of the bridge and the mechanism used for operating the bridge. Fig. 7 illustrates a diagram of electric connections that may be used for controlling the electric motor that operates the bridge. Fig. 8 illustrates diagrammatically the operative periods of the motor with reference to the movement of

a point on the bridge. Fig. 9 is a perspective view of a switch box, a part of the box being shown as broken away to illustrate the mechanism located therein.

5 The platforms 1 may be formed of any building material, such as concrete. They are located adjacent the tracks 2 and are spaced apart slightly greater than the width of the larger freight cars, and are located
10 above the tracks at a height substantially the same as the height of the floors of the freight cars. The bridges 3 may be formed of any suitable structure that will properly act as a support for the sections 5 of the track and the
15 cars that may run over the track. Thus the bridges 3 may be provided with the usual ties 6 to which the sections of rails 5 may be connected and a plurality of strips 7, that form a flooring between the sections 5 of the rails and between the rails 5 and the ends
20 of the bridge 3, the usual space 8 being left between the sections 5 of the rails and the adjoining strips 7 for the flanges of the wheels of the cars that may move over the
25 bridge when the bridge is lowered to the level of the track. The bridge construction may also be provided with metal bracket members 10 having the brackets 11 located at their ends. A pair of arms 12 may be
30 connected to the bracket members 11 and to shafts 13 which, when rotated, will cause the arms 12 to raise or lower the bridge 3 to the level of the platforms 1 or to place the sections 5 in alignment with the tracks 2.
35 The bridge 3 is operated by means of an electric motor 15 that is located in a pit 16 formed below the tracks 2. The motor 15 is connected to a shaft 17 through a suitable reducing gear that may be located in the gear casing 18. The ends of the shaft 17 are provided with bevel pinion gears 19 that mesh
40 with a pair of bevel gears 20 which are connected to the shafts 13 to which the arms 12 are connected. The shafts 13, and consequently the lower ends of the arms 12, are
45 located at points distant from each other substantially the same as the bracket members 10, whereby the arms 12 are maintained in parallel relation as they are oscillated in the operations of the motor 15 and the bridge 3
50 will thus be maintained at all times in substantially a horizontal position in its movements from the level of the tracks to the level of the platforms.
55 In order to securely lock the bridge 3 in position when the sections 5 of the rails are in alignment with the rails 2, suitable locking brackets may be located at the corners of the bridges for preventing any lateral or longitudinal movements of the bridge. In the particular form of construction shown, the
60 brackets 11 are preferably formed wedge shaped, and castings 25, having V-shaped recesses 26, are located in the pit 16 to receive the wedge shaped brackets 11. The

edges of the brackets 11 and of the recesses 26 of the castings 25, located on the sides of the brackets and recesses nearest to the motor, namely, the edges 27 and 28, are preferably, curved so as to allow for the swinging movement of the bridge while the brackets 11 are within the recesses 26 and to also provide for the fitting of the brackets 11 within the castings to securely lock the bridge when it is located in alignment with the bed of the track.

In order that the bridge may be secured in its position, when it is raised to the level of the platforms, the arms 12 have a length sufficient to raise the top of the bridge above the level of the platform when the arms 12 are located in vertical positions. Suitable stops 30 are secured in the concrete of the platform structure and are so located as to engage the ends of a tie 6 and a pair of the brackets 11 when the arms 12 are swung beyond the vertical and at a point so as to locate the top surface of the bridge at the level of the tops of the platforms. Thus the bridge 3 will be held in its position for, in order to move from this position, the bridge 3 must be lifted a short distance and any load that is put on the bridge will cause it to more securely lock or engage the stops 30.

In the operation of the bridge by the motor, the motor must necessarily do work on the bridge in order to raise it a short distance to cause the arms 12 to pass through the vertical, whereupon the weight of the bridge will operate to lower the bridge, the arms 12 working through the reduction gear on the motor. Also, when the bridge is raised, work is done by the motor in raising the bridge until the arms 12 pass through the vertical and whereupon the weight of the bridge will cause the brackets 11 to engage the stops 30. The work done by the motor is indicated in Fig. 8 where the curves of the sectors indicate the periods during which the work is done by the motor in lowering and raising the bridge. The sides of the sectors indicate the relative location of the arms 12. The sector 31 indicates the operation of the motor when the bridge is being lowered, while the sector 32 indicates the working period of the motor when the bridge is being raised. The control of the motor 15 may be obtained through the movement of a part of the mechanism connected to the motor and which is actuated in accordance to the movement of the bridge to close and open desired circuits between the source and the motor whereby direct rotation may be had at desired times and reverse rotation may be had at other times. In the form of construction shown in the drawings, the circuits of the motor may be controlled by means of the contacts 40, 41, 42, and 43; which are located arcuately on the panel 65 of insulating material, that is secured to one side of the switch box 66, and

the switch arms 67 and 68, that are connected to the shaft 13, to which the arms 12, that raise and lower the platform bridge, are connected. The switch arms 67 and 68, therefore, move with the arms 12 and also move over the contacts 40, 41, 42, and 43 to open and close the circuits, that are controlled by manual switches 45 and 46. When the platform bridge is being lifted, the contacts 41 and 43 are connected with the source of supply of current through the operation of the manual switch 45. Thus, to raise the bridge, the switch 45 is closed and, as the bridge is raised and the switch arm 67 moves over the contacts 43 and 41, until the circuit is completed to the contact 41. To lower the bridge, the switch 46 is closed and the arms 67 and 68 again move over the contacts to control the circuits of the motor until the contact 41 is opened. The contact arms 67 and 68 are mounted on the sleeve 69 of insulating material to insulate the arms 67 and 68 from the shaft 13 and from each other. Preferably, the switch arms 67 and 68 are connected to rings 70 and 71, respectively, and brushes 72 are located on the bottom of the box so as to make sliding contact with the rings 70 and 71. The arms 67 and 68 are connected to the manual switches 45 and 46 through the brushes 72 and the lines 53 and 63. In order that the arms 67 and 68 may be made of light metal, they may extend through an arm 73 formed of insulating material and, preferably connected to, or formed integral with, the insulating sleeve 69. The arm 73 will thus move and guide the ends of the more flexible arms 67 and 68 in the angular movements of the shaft 13. The circuit of the motor is thus closed and opened automatically at desired points, subject, however, to the control of a manual means for closing the circuits of the motor to raise or lower the bridge according to its initial position. The switches 45 and 46 are provided with double contacts, one for the supply line and the other to complete the circuit. When the bridge 3 is to be raised, the switch 45 is pushed in, closing the contacts 48 and 49. The contact 48 closes the circuit from the supply line 50 to the motor 15 through the line 51 and thence through the contact 49 by the line 52 to the contacts 41 and 43 by the line 53. As the bridge begins to move upwardly, the lower point 55 of the sector 32 is reached and the contact 43 is thrown open. The circuit is then completed through the contact 41. The continued movement upward, closes the contact 42 as the low point 56 of the sector 31 is reached. The arms 12 in their rotation then passing the vertical center line and at the point 57 of the sector 32 open the contact 41, thereby completely opening the circuit of the motor through the switch 45. The bridge is then moved by reason of its own inertia to the stop

30 past the upper point 58 of the sector 31 so that the contact 40 is closed. When the contact 42 is closed, the power may be short circuited and to prevent such occurrence, the switch 46 is provided with the auxiliary switch 60 which is maintained open.

When the bridge 3 is to be lowered, the switch 46 is operated, which preferably automatically opens the switch 45. The power supply lines to the motor are then reversed through the connection 61 and connection with the contacts 40 and 42 is established to the auxiliary switch 60 through the lines 62 and 63. As the bridge descends, the contact 40 is opened, the switch 41 is closed and the contact 42 is opened, thereby opening the circuit of the motor. Near the end of the downward travel or at the point 55 of the sector 32, the contact 43 is closed so that the contacts 41 and 43 are closed for later operation to raise the bridge.

The contact 49 and the auxiliary switch 60 are provided to prevent short circuiting of the motor since the connections from the switches 45 and 46 through the motor 15 and the switches 40 to 43 inclusive are so made that, as the switches 40 to 43 inclusive are successively opened or closed, secondary lines are established temporarily, as through the lines 51 and 62 and the lines 61 and 52.

The connections described are merely illustrative of possible controlling system whereby the bridge mechanism may be operated. Such controlling systems may partake of different forms and include signalling elements to signify track clearance or obstruction at points of entrance to the freight house or freight station and also, if desired, track lockout mechanism to block movement of the cars on to the spurs between the platforms. Also, the system may be varied according to the character of the current used in operating the motor, such as where three phase alternating current is used, to obtain the requisite reversal of operation of the motor and the mechanism actuated thereby. The system selected is purely illustrative of a combined manual and automatic electric control for the motor.

We claim:

1. In a railroad platform bridge, a bridge member having rail sections, a pair of platforms located above the railroad track, and means located below the railroad track for raising the bridge member from the plane of the track bed to the level of the platforms and for lowering the bridge member to the level of the track bed.

2. In a railroad platform bridge, a bridge member having rail sections, a pair of platforms located above the railroad track, arms connected to the bridge member, a pair of shafts for operating the arms, the arms and the shafts located below the bridge member, means for operating the shafts to swing the

arms for raising and lowering the bridge member between the levels of the platforms and the railroad tracks.

3. In a railroad platform bridge, a bridge member having rail sections, a pair of platforms located above the railroad track, and means located below the railroad track for raising the bridge member from the plane of the track bed to the level of the platforms and for lowering the bridge member to the level of the track bed, means for locking the bridge member in its raised and lowered positions.

4. In a railroad platform bridge, a bridge member having rail sections, a pair of platforms located above the railroad track, arms connected to the bridge member, a pair of shafts for operating the arms, the arms and the shafts located below the bridge member, means for operating the shafts to swing the arms for raising and lowering the bridge member between the levels of the platforms and the railroad tracks, means for locking the bridge member in its raised and lowered positions.

5. In a railroad platform bridge, a bridge member having rail sections, a pair of platforms located above the railroad track, arms connected to the bridge member, a pair of shafts for operating the arms, the arms and the shafts located below the bridge member, means for operating the shafts to swing the arms for raising and lowering the bridge member between the levels of the platforms and the railroad tracks, a limiting stop for limiting the movement of the arms to a point located on the sides of the verticals through the shafts opposite to that on which the body portions of the arms are located when the bridge is located in the plane of the bed of the track, the bridge member having protruding parts, socket members fixedly supported relative to the track substantially fitting the protruding parts of the bridge member and for receiving the protruding parts when the bridge member is lowered to the level of the track.

6. In a railroad platform bridge, a pair of platforms located substantially at the level of the floors of the freight cars, a bridge member having rail sections, an electric motor for raising the bridge member from the level of the track bed to the level of the platforms and lowering the bridge member from the level of the platforms to the level of the track bed, a manual switch connected in the circuit of the motor, a plurality of switches automatically operated in accordance with the operations of the motor to open and close the circuits of the motor to automatically disconnect the motor power to operate the bridge and to disconnect the motor when the bridge is in position to be actuated by its own weight and for setting the circuit of the motor for succeeding reverse

movement of the bridge when the manual switch is operated.

In witness whereof we have hereunto signed our names to this specification.

ALBERT E. ZOLLER.
CLAUD L. FULGHUM.

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