June 27, 1967 G. F. BRIDGES ETAL 3,327,650

BRIDGE PLATE AND LATCHING ARRANGEMENT THEREFOR

Filed June 23, 1965 2 Sheets-Sheet 1

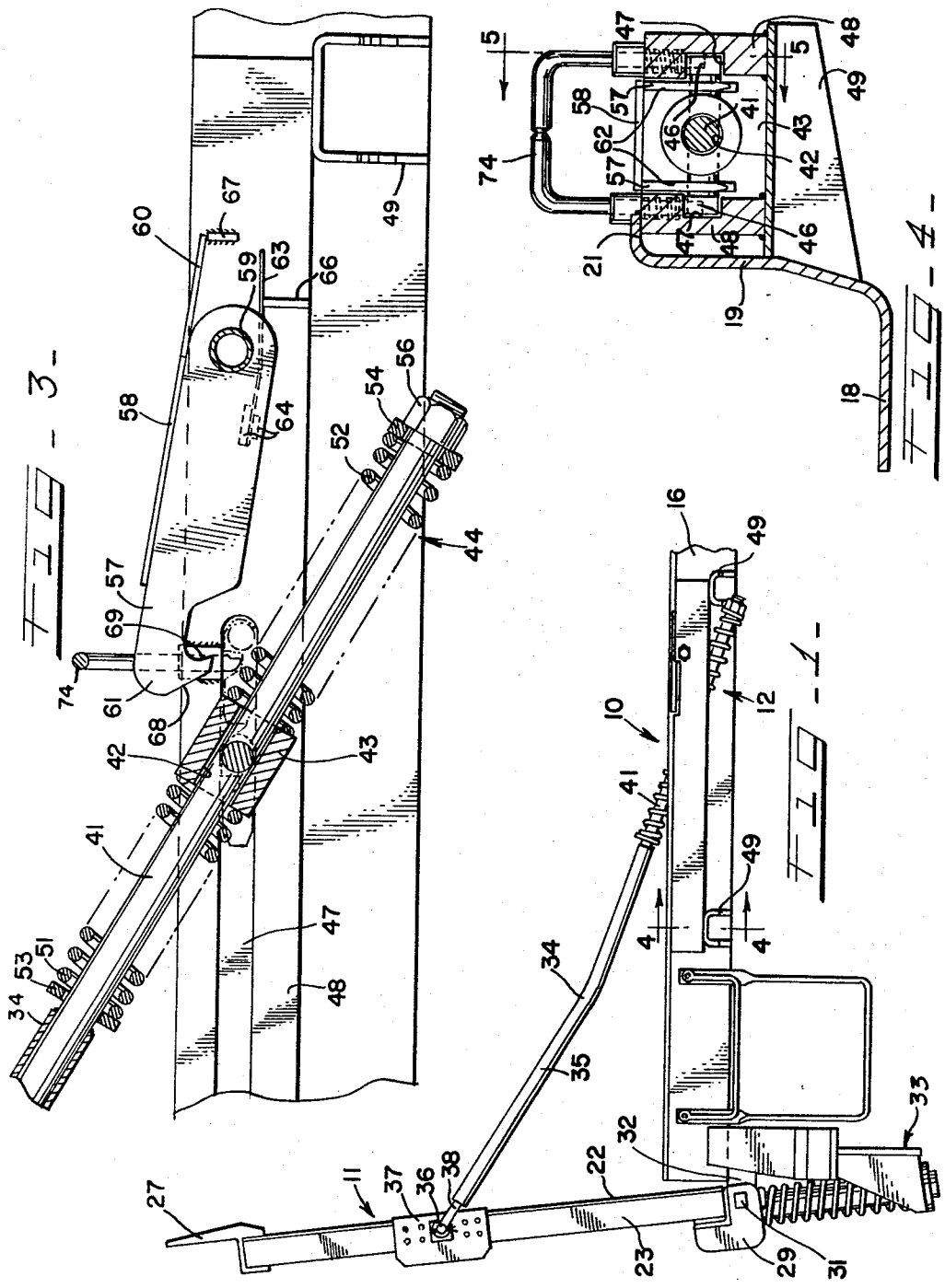


FIG - 3 -

FIG - 4 -

FIG - 1 -

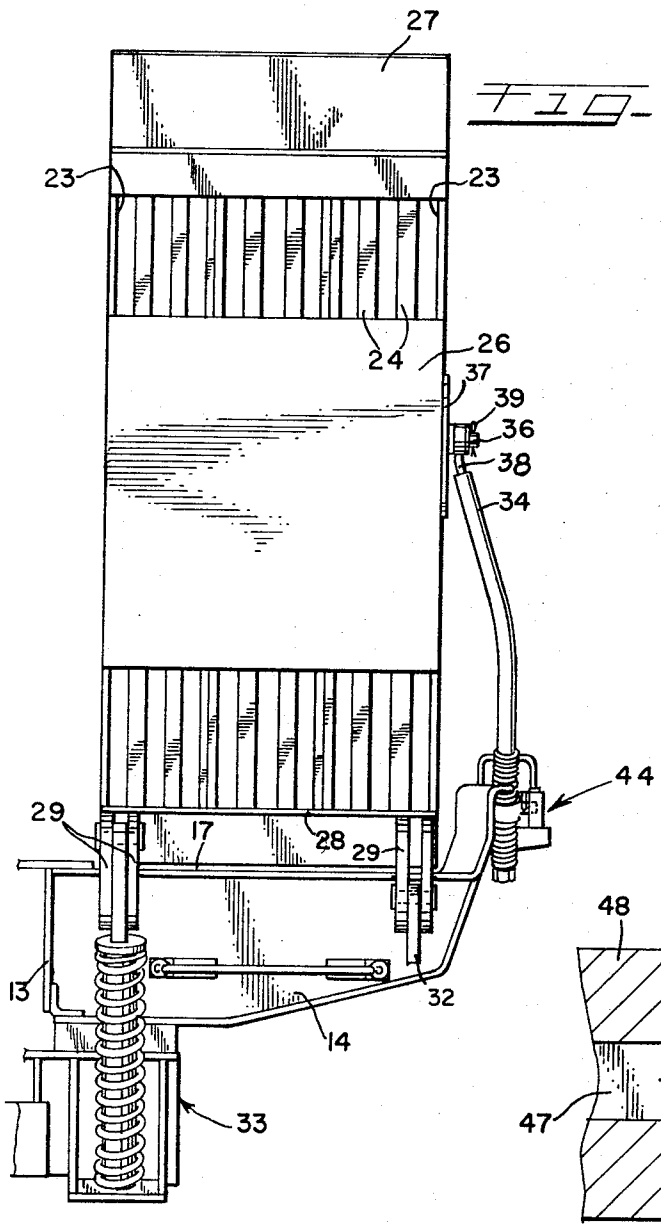
INVENTORS
GEORGE F. BRIDGES
WILLIAM R. SHAVER
BY Fred P. Kolisch
ATT'Y.

June 27, 1967 G. F. BRIDGES ETAL 3,327,650

BRIDGE PLATE AND LATCHING ARRANGEMENT THEREFOR

Filed June 23, 1965 2 Sheets-Sheet 2

FIG. 2



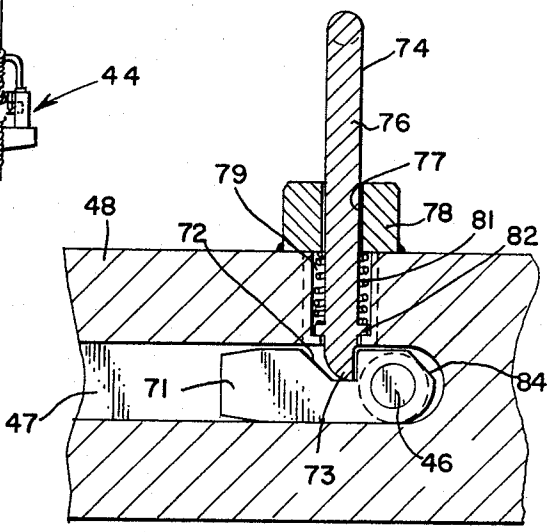


FIG. 5

INVENTORS
GEORGE F. BRIDGES
WILLIAM R. SHAVER

BY Fred P. Kostka
ATT'Y.

United States Patent Office 3,327,650 Patented June 27, 1967

3,327,650

BRIDGE PLATE AND LATCHING ARRANGEMENT THEREFOR

George Frederick Bridges, Chicago, Ill., and William R. Shaver, Munster, Ind., assignors to Pullman Incorporated, Chicago, Ill., a corporation of Delaware

Filed June 23, 1965, Ser. No. 466,185
5 Claims. (Cl. 105—458)

The present invention relates to bridge plates used in piggyback railway cars for spanning the distance between adjacent ends of coupled piggyback cars and more particularly to a new and improved arrangement for latching a bridge plate in an inoperative stored position during transit of the railway car.

Bridge plates of the general type to which the present invention relates are mounted adjacent the end sill of a piggyback or flat railway car for pivotal movement between an inoperative generally vertical transit position and an operative horizontal use position. In the operative horizontal use position the bridge plate is used to span the distance between the adjacent ends of two coupled piggyback cars so as to permit the loading and unloading of semi-trailers lengthwise of a line or string of railway cars.

In transit the bridge plate is stored and raised in a substantially vertical position. When thus raised, the bridge plate is subject to acceleration and deceleration forces which may be of such a magnitude as to cause the pivotal connection of the bridge plate to fail. Such failures are particularly prevalent when the length of the bridge plate is such that the free end of the latter projects a considerable distance above the pivot connection and thus creates a long moment arm tending to cause failure of the pivotal connection when subject to acceleration and deceleration forces. Bridge plates of the length causing these problems are used in long travel cushioned underframe cars when the distance to be spanned is frequently in excess of six feet or more.

It is the principal object of the present invention to provide a pivotally connected bridge plate of the general type discussed above with a latch arrangement which serves to yieldably support the bridge plate in its raised operative position so as to cushion the forces imposed on the pivot connection.

It is another object to provide a new and improved latching arrangement in which there is used a foot actuated locking means for releasing the bridge plate for movement from its erect transit position to the operative horizontal position.

It is another object taken in conjunction with the immediately foregoing object to provide a hand releasable safety locking mechanism which must be released before the foot releasable locking means is effective to permit locking of the bridge plate to its horizontal position.

Further objects and features will hereinafter appear.

In the drawings:

FIG. 1 is a fragmentary side elevational view of one end of a piggyback railway car showing a bridge plate mounted thereon and embodying the latching arrangement of the present invention;

FIG. 2 is a fragmentary and elevational view of the railway car and bridge plate shown in FIG. 1;

FIG. 3 is an enlarged fragmentary side elevational view of the lower end of the latching arrangement fixed to the side sill of the railway car and showing the locking mechanism for securing the retainer bar locked in the erect transit position of the bridge plate;

FIG. 4 is an enlarged sectional view taken generally along the lines 4—4 of FIG. 2 and showing in particular the safety lock arrangement; and

FIG. 5 is an enlarged sectional view taken generally along the lines 5—5 of FIG. 4.

Referring now to the drawings, there is illustrated one end of a piggyback or flat railway car 10 including a bridge plate 11 which uses the latching arrangement 12 embodying the principles of the present invention.

The piggyback railway car 10 of which only one end is illustrated in FIG. 1 and FIG. 2 because the other end is substantially identical, may be of more or less conventional construction including center sill 13, an end sill 14, side sill 16 and a floor 17. The side sill 16 may be formed of a substantially Z-shaped section including a horizontal base web 18 from which there extends a substantially vertical web 19 which terminates at its upper end in an outwardly extending horizontal flange 21.

The bridge plate 11 includes a horizontal support plate 22 along the side edges of which there may be fixed vertical side plates 23—23. Transversely spaced along the underside of the support plate 22 there is a plurality of reinforcing ribs 24 which may be I-beams or the like. Extending across the bottom edges and spanning the side plates 23 is a reinforcing plate 26. Fixed to the upper end of the support plate 22 and side plates 23—23 is support lip 27 which is adapted to rest on a bridge plate of an adjacent car or the end sill portion of the car. The support lip 27 may be formed from a casting or the like. Depending and fixed to a transverse plate 28, fixed to and spanning the side plates 23 along the bottom edges thereof is a pair of hinge brackets 29—29. The hinge brackets 29—29 receive a hinge pin 31 which is supported by an outwardly projecting hinge plate 32 fixed as by welding to the end sill 14. The hinge pins 31 may be squared at the outer ends in order to prevent rotation thereof relative to the hinge brackets 29—29.

The bridge plate 11, as above described, is free to be movable about the pivot pin 31 for movement between the illustrated vertical position and a horizontal position which spans the distance between the adjacent ends of a coupled railway car not shown. To assist in the movement of the bridge plate 11 from the horizontal use position to the generally vertical transit position there may be provided a counterbalancing arrangement generally designated 33. The counterbalancing arrangement is constructed so as to reduce the amount of force necessary to elevate the bridge plate 11 to the erect transit position. In the erect position the counterbalancing arrangement 33 exerts little if any spring force to retain the plate in the position shown. For a more detailed description of the counterbalancing arrangement 33 reference is made to U.S. patent application Ser. No. 330,761, filed Dec. 16, 1963, now Patent No. 3,216,373 and assigned to the assignee of the present invention.

For holding the bridge plate 11 in its inoperative stored position there is provided the latching arrangement 12 embodying the principles of the present invention. The latching arrangement 12 includes a tie or retaining bar 34 pivotally secured at one end by means of a pivot stud 36 to a bracket plate 37 fixed to the outboard side plate 23 of the bridge plate 11. The pivot stud 36 is suitably fixed to the bracket plate 37 as by a force fit or welding. As shown, the tie bar 34 may be formed of a tubular member 35 having fixed to the uper end an I-bolt member 38 which is received by the pivot stud 36. Retaining the I-bolt member 38 on the pivot stud 36 is a cotter pin 39.

At its other end the tie bar 34 has inserted within the tubular member a rod 41 which is fixed to the tubular member as by welding. The rod 41 slidably extends through an opening 42 of a slide member 43 forming part of the latching mechanism 44 for retaining the bridge plate in the inoperative transit position.

The latching arrangement 44 includes the slide member 43 which, as shown in particular in FIGS. 3 and 4, may

be formed from a rectangular block having a longitudinal opening 42 formed therein. Extending transversely outwardly from each end of the block 43 are slide pins 46—46 which are slidable in grooves 47—47 formed on the inner faces of transversely spaced guide blocks 48—48.

The transversely spaced guide blocks 48—48 are supported along the side sill 12 by means of longitudinally spaced inverted U-shaped brackets 49—49 and fixed to the web 19 as by welding. The inner one of the guide blocks 49 may be fixed to the upper flange 21 of the side sill 12.

Yieldably restraining the tie bar 34 against relative lengthwise movement of the slide bar 43 are opposed springs 51 and 52. The upper spring 51 abuts at one end against a washer 53 fixed to the rod 41 as by welding and the other end abuts against the slide block 43. The lower spring 52 abuts at one end against a washer 54 which is held on the rod 41 by means of a nut 56 and the other end thereof abuts against the underside of the slide block 43. The opposing springs 51 and 52 are operative to restrain the movement of the slide block 43 relative to the tie bar 41.

For holding the tie bar 34 locked in the raised position of the bridge plate 11 there is provided a pair of locking plates 57—57. The locking plates 57—57 are transversely spaced and connected by means of a plate 58 including a projection 60 which extends beyond a pivot 59 to permit rocking movement of the latch plates 57 about the latter as more fully to be described hereinafter. The pivot 59 may be formed by a tubular member supported between guide blocks 48—48. The forward ends of the locking plates 57—57 are each formed with hook portions 61—61 which are adapted to embrace the slide pins 46—46 when the tie bar 34 is in the locked position. The hook portions 61—61 are guided within recessed sides 62—62 from along the side faces of the guide block 43 as shown in FIG. 4.

Resiliently biasing the locking plates 57—57 into the path of movement of the slide pins 46—46 is a leaf spring 63 which is fixed at one end between a pair of plates 64 spanning the locking plates 57—57. At its other end the leaf spring 63 bears against and is supported by a post 66 spanning the transversely spaced guide blocks 48—48. To elevate the locking plate out of its latched position a force is applied to the projecting end 60 of the plate 58 so as to overcome the force of the leaf spring 63 and thereby to permit the turning of the locking plates 57—57 about the pivot 59. Limiting the turning movement of the locking plates 57—57 is a limit block 67 which is fixed to the guide blocks 48—48 and abuts the projecting end of the plate 60 when maximum turning of the locking plates 57—57 occurs.

The outboard face of the locking plates 57—57 may each be formed with camming surfaces 68—68 which when contacted by the slide pins 46—46 serve to force the locking plates 57—57 upwardly against the force exerted by the leaf spring 63 until the slide pins are positioned rearwardly of the hook 69 whereupon the leaf spring 63 is again effective to move the locking plates 57—57 into a locking position overlying the slide pins 46—46 as shown in FIG. 4.

In operation, to release the tie bar 34 and thereby permit the bridge plate 11 to be turned about the pivot 59, foot pressure may be applied on the projecting end or extended portion 60 of the plate 58 so as to turn the hook section 61 out of the path of movement of the slide pins 46—46. The slide pin 46 and thereby the slide bar 43 and tie bar 34 are then free to move within the guide slots 47—47 under influence of the weight of the bridge plate 11.

To prevent inadvertent release of the slide pin 46—46 there is provided a manual safety locking arrangement including a pair of notched locking blocks 71 which are secured to the terminal ends of the slide pins 46—46 and slidable within the grooves 47—47. The locking blocks 71—71 are each formed with notches 72—72 which receive the respective ends 73 of an inverted U-shaped locking handle 74. The handle 74 includes downwardly depending legs 76 on which the locking ends 73 are formed and are guided for vertical movement in openings 77 formed in guide collars 78—78 fixed to the respective guide blocks 48—48 and through openings 79—79 formed in the guide blocks 48—48 adjacent the terminal end of the slide pin guide slots 47—47. The handle 74 is normally biased into the path of movement of the slide pins 46—46 and locking blocks 71 by means of biasing springs 81 which abut at one end against collars 82 formed adjacent the ends 73 and at their other ends against the underside of the guiding collars 78.

During the raising of the bridge plate 11 the lower end of the tie bar 34 moves rearwardly so the slide block 43 with the slide pins 46 and the lock blocks 71 move from the left to the right as viewed in FIG. 5, whereupon a camming surface 84 formed on the locking block 71 urges the handle 74 upwardly against the force of the biasing springs 81 until the terminal ends 73 align with the respective slots 72—72 in the locking blocks 71. In this location the biasing springs 81 are effective to seat the ends 73—73 into the respective notches 72—72 of the blocks 71 and thereby hold the slide block 43 in the locked position simultaneously with the locking plates 57, as heretofore described.

In the raised or erect position when the railway car 10 is subject to acceleration or deceleration forces, the bridge plate tends to rock about the pivot studs 39. In the presence of such rocking movement the tie rod 34 connected to the bridge plate 11 and the slide block 43 of the latching arrangement moves axially within the opening in the slide block 43 against the force exerted by spring 53 or 54 which opposes the direction of rocking movement. Thus the springs 53 and 54 are operative to cushion the force applied on the bridge plate and thereby to relieve the stresses at the hinged end thereof and at the latch mechanism.

We claim:

1. A latching arrangement for a bridge plate which is hingedly attached adjacent the end of a railway car for turning movement between a generally horizontal bridging position and a generally upstanding stored position, said latching arrangement comprising a tie bar hingedly connected at one end to said bridge plate intermediate the length thereof, longitudinally extending guide means fixed adjacent the side of said car, slide block means mounted on the other end of said tie bar and guided for movement within said guide means during movement of said bridge plate between said bridging and stored positions, said slide block means being yieldably movable lengthwise of said tie rod when said bridge plate is in said stored position and acceleration and deceleration forces are applied to the latter, and means lockingly engaging said slide block means for restraining movement in said guide means and thereby to maintain said bridge plate in said stored position.

2. The invention as defined in claim 1 wherein said slide block means includes an opening through which said tie bar extends, and compression spring means is disposed about said tie bar on opposite sides of said slide block thereby to render said slide block yieldably movable lengthwise of said tie bar.

3. The invention as defined in claim 2 wherein said slide block includes slide pins guided within said guiding means, and said locking means includes a spring biased and turnably mounted locking plate means located in the path of movement of said slide pins so that said slide pins are operative to turn said locking means against the force of the spring bias to turn said locking means until said bridge is in said stored position whereupon said locking means is operative to capture said slide pins.

4. The invention as defined in claim 3 wherein said turnable locking means includes a projection located with respect to the pivot axis of said locking means to turn said locking means from the captured to a release position upon

the application of a force applied thereto to overcome said spring bias.

5. The invention as defined in claim 4 wherein there is provided a hand actuated locking means includes notched lock means fixed to said slide pins for movement therewith, and spring biased locking plunger means slidably mounted on said guide means for movement into said notches when said slide pins are captured by said lock plates.

References Cited

UNITED STATES PATENTS

3,203,364	8/1965	Gutridge	105—458
3,257,972	6/1966	Boone et al.	105—458

ARTHUR L. LA POINT, *Primary Examiner.*

D. E. HOFFMAN, *Assistant Examiner.*