

Nov. 9, 1965

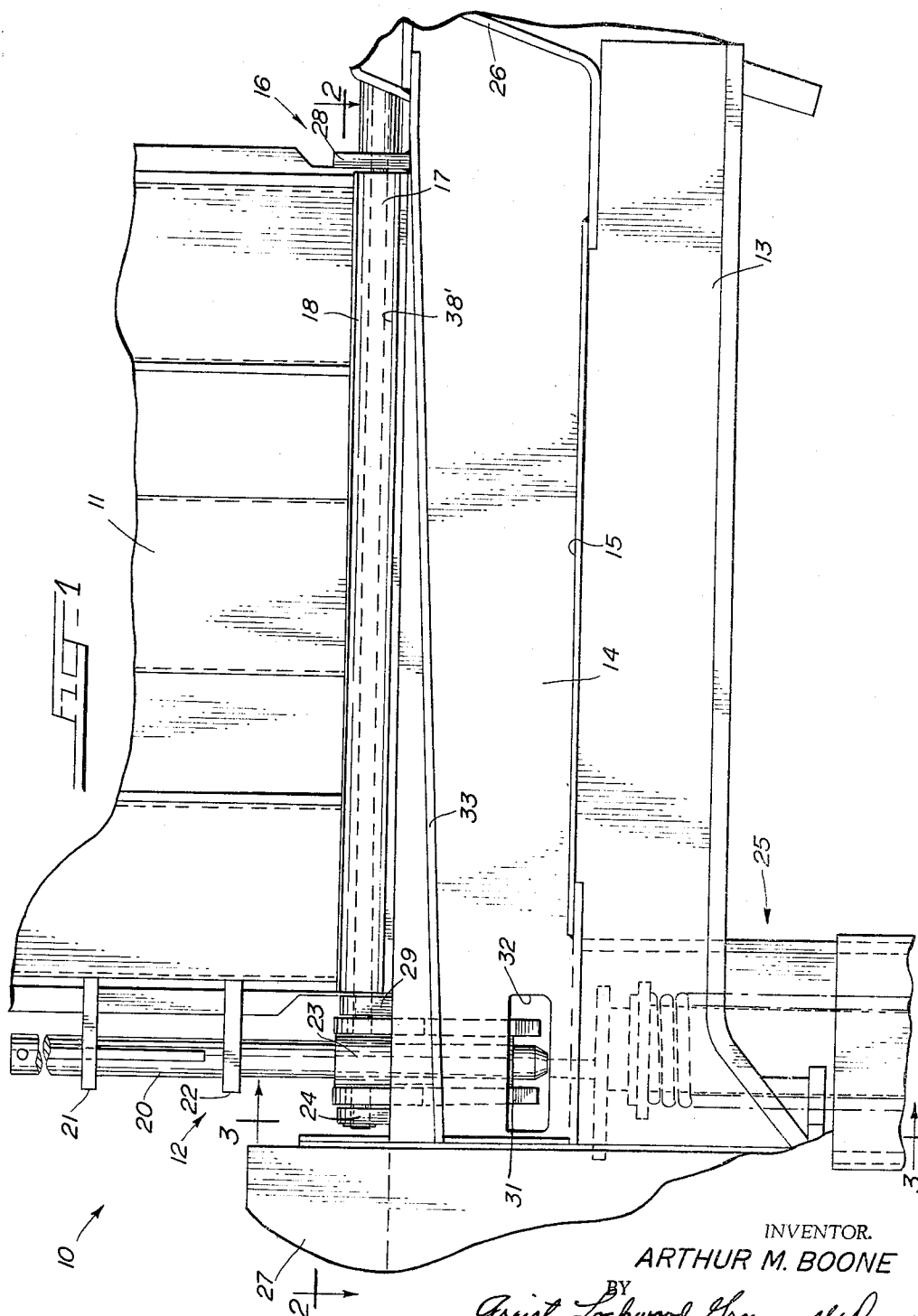
A. M. BOONE

3,216,372

BRIDGE PLATE HOLDER

Filed Dec. 20, 1963

4 Sheets-Sheet 1



INVENTOR.

ARTHUR M. BOONE

BY

Grist, Lockwood, Greenawald & Pusey
ATTYS.

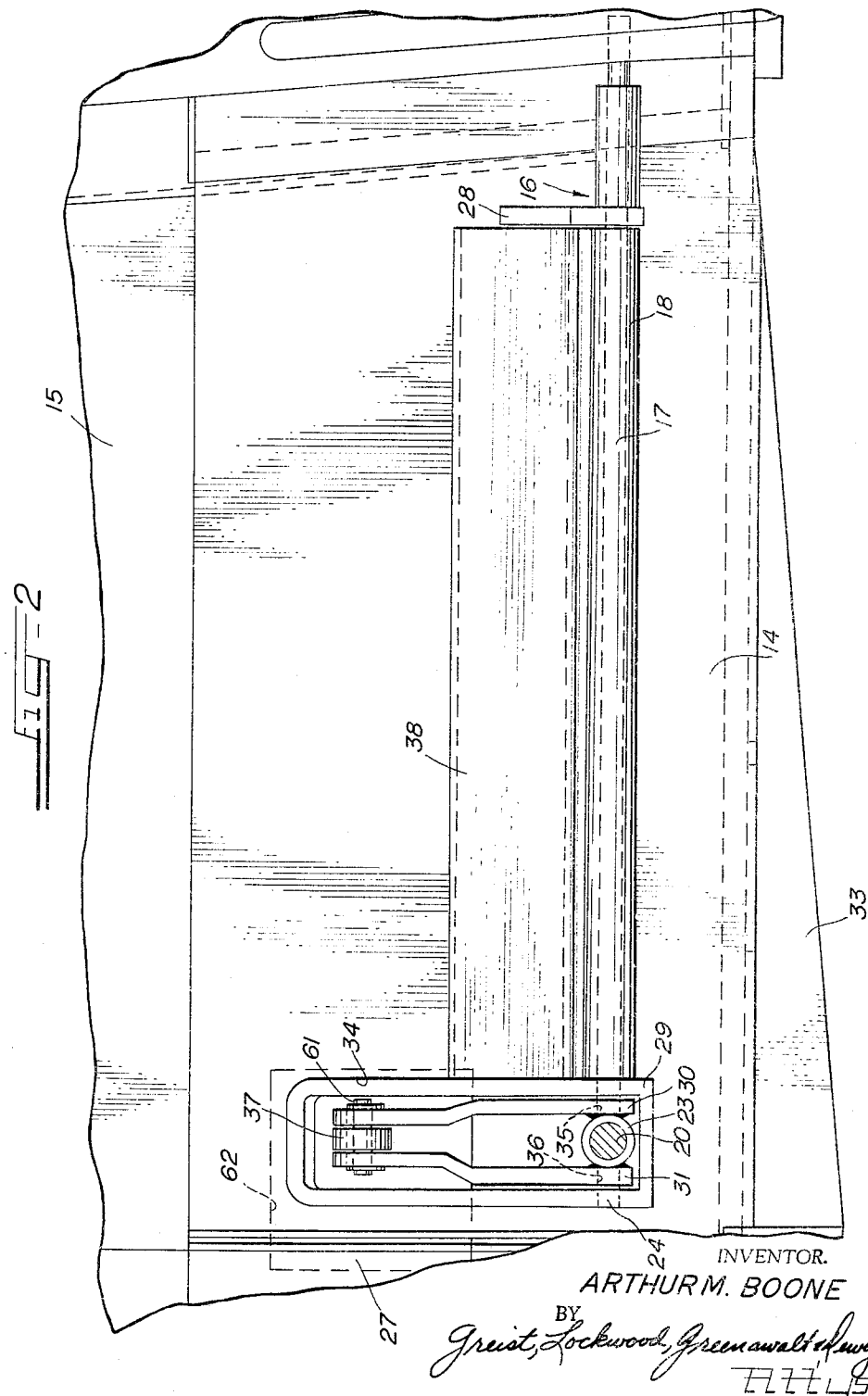
Nov. 9, 1965

A. M. BOONE
BRIDGE PLATE HOLDER

3,216,372

Filed Dec. 20, 1963

4 Sheets-Sheet 2



Nov. 9, 1965

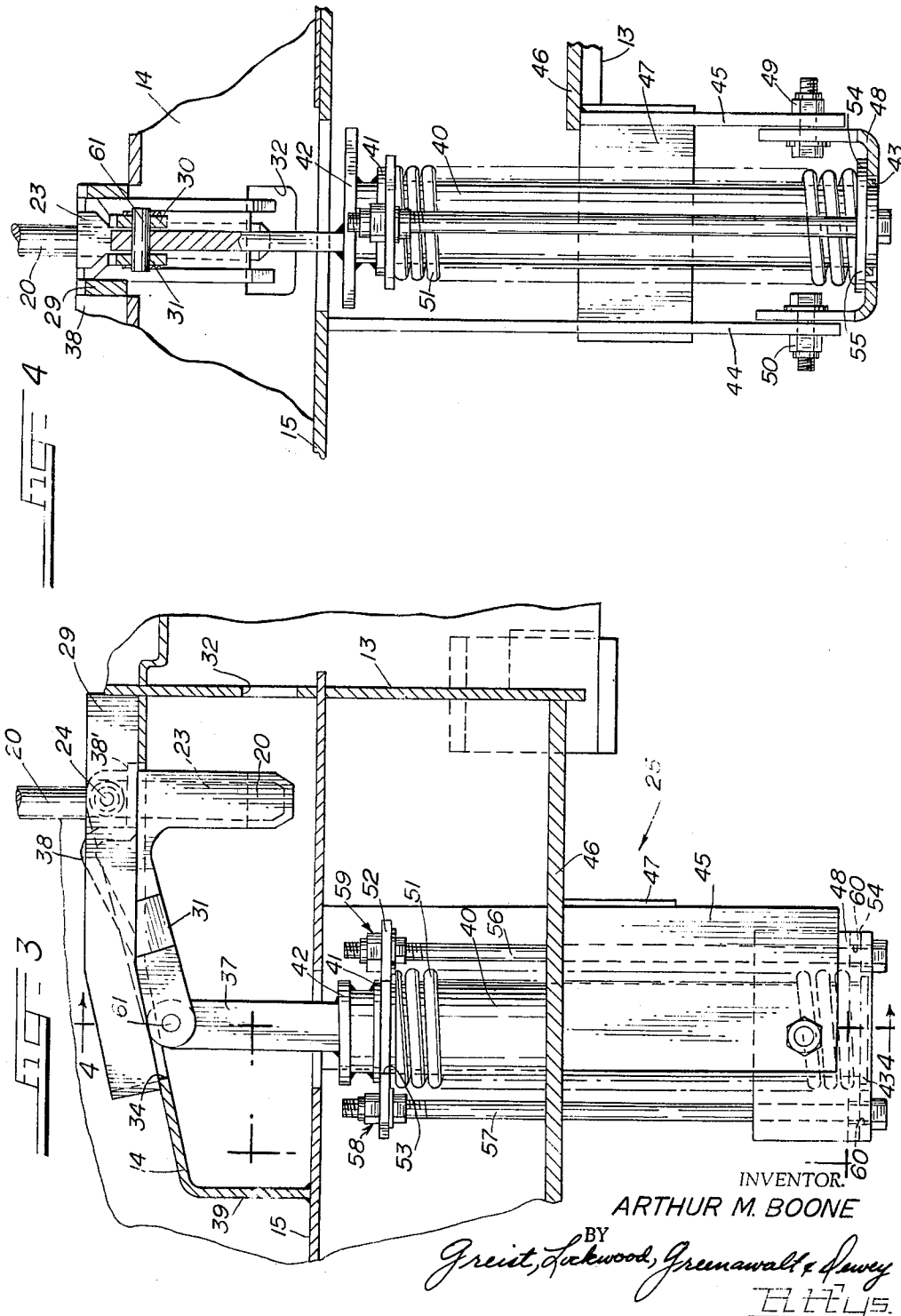
A. M. BOONE

3,216,372

BRIDGE PLATE HOLDER

Filed Dec. 20, 1963

4 Sheets-Sheet 3



Nov. 9, 1965

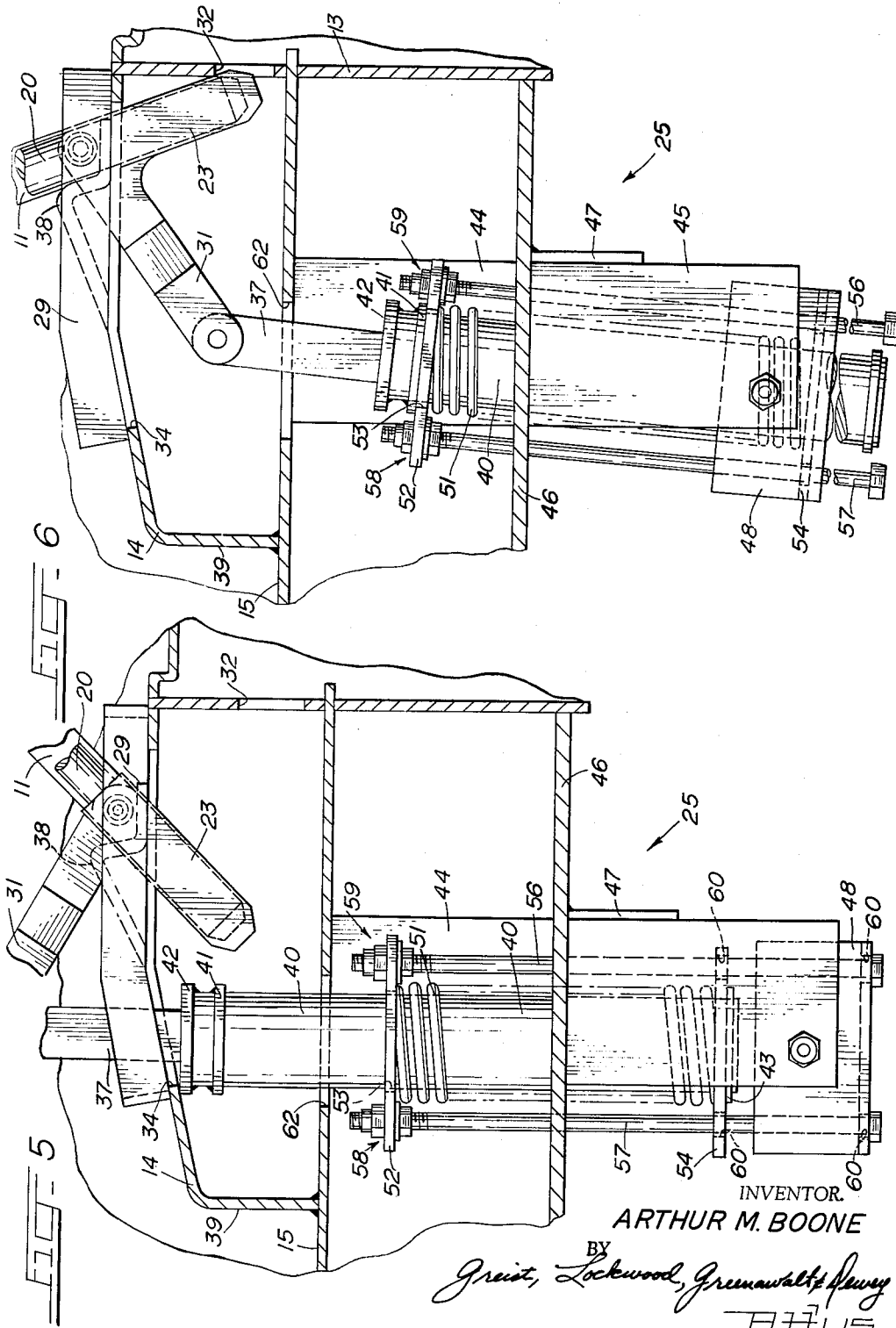
A. M. BOONE

3,216,372

BRIDGE PLATE HOLDER

Filed Dec. 20, 1963

4 Sheets-Sheet 4



1

3,216,372

BRIDGE PLATE HOLDER

Arthur M. Boone, Michigan City, Ind., assignor to Pullman Incorporated, Chicago, Ill., a corporation of Delaware

Filed Dec. 20, 1963, Ser. No. 332,057

8 Claims. (Cl. 105—458)

This invention relates to a new and improved bridge plate holder for securing a bridge plate in the inoperative or transit position. More specifically, the present invention relates to a novel locking device for resiliently securing a bridge plate on a piggyback type railway car in a transit position in order to reduce the possibility of damage to the supporting and locking structure.

The popularity of piggyback type hauling has increased the demand for railway cars of the type particularly adapted for piggyback hauling operations. Research and development efforts have been directed towards improving the design of piggyback type railway cars and the associated structure. The results of these efforts are evident in the wide variety of types of cushioning means to protect the lading from buff and draft forces as well as other forms of useful means such as bridge plates to assist in loading and unloading of various forms of vehicular lading. One problem which has been encountered in connection with piggyback type railway cars, exists in the area of the locking means for storing the bridge plates during transit. Various types of locking devices have been proposed for locking the bridge plates in a vertical or transit position when not in use.

One form in particular, which is presently in use, includes a locking pin slidably disposed along the marginal edge of the bridge plate, and having an end portion which is slidably received in a socket rigidly attached to the car in order to lock the bridge plate in a transit position. Obviously, the simplified design is highly desirable from the cost and manufacturing stand-point, however has not been completely satisfactory operationally.

One problem which has caused considerable concern in the industry is the high frequency of breaking, bending and general disabling of this form of locking structure, oftentimes occurring when trailers are being moved into position on the car. Trailers used in piggyback lading operations are of varying lengths, generally being 40 feet or slightly under. In positioning such a trailer of great length on the railway car, it is necessary to back the trailer into position and thereafter support the same by means of a fifth wheel stand or the like. Oftentimes, in positioning the trailer, the rear portion comes into contact with the bridge plate during the backing operation, and the locking structure is damaged, usually in the form of a bent pin, broken parts or the like. Other dynamic forces occur in car operation, which also can cause damage to the locking structure. Representative of these forces are those arising due to car impacts in buff and draft, and wind forces acting on the rather broad surface of the bridge plate. It was expected that the development of cushion means for cars of this type would alleviate the problem somewhat insofar as buff and draft forces were concerned, however the problem still remains to a large degree. Installation problems arose with regard to the application of prior designs to cushioned travel cars due to the rather complex underframe structure and sill designs.

The proportion of locking structure failures magnified as bridge plates increased in length on those cars having the exceptionally long cushion travel, for example a range of 20 to 40 inches in each direction. Bridge plates of necessity had to be lengthened on cars of this type, and obviously had to be made deeper in the center section in order to accommodate the increased shear forces. As expected, the bridge plates became heavier and heavier,

2

which amplified the problem of providing an acceptable locking device a great deal. Lightweight metals were resorted to in an effort to try to reduce the overall weight of the bridge plate in order to effect a solution of the problem, however, in practice this approach proved somewhat short of being completely successful. Other locking devices of a more sophisticated nature were tried but failed to fulfill the needs of the industry for various reasons. Several other problems of a minor but equally objectionable nature exist in present designs which are of considerable concern to the industry as a whole.

The locking device of the present invention relates to improved means for resiliently securing the bridge plate in an upright or transit position. The present construction utilizes arrangement and novel positioning of the locking device together with a unique linkage system to improve the versatility of the application of the device, making it appropriate for a wide variety of types of railway cars. In the present construction, an effort has been made to redirect the forces, generated initially by the dynamic forces causing bridge plate movement, back through a linkage system operationally interconnected to the bridge plate, in a unique manner to maintain the generated forces operating in proper alignment thereby maximizing the overall efficiency of bridge plate control. Substantial benefits and numerous advantages are derived in the use of the present device, all of which will become readily apparent when a consideration is given to the more prominent objects to be achieved and the detailed description of the unique construction given hereinafter.

It is therefore an object of this invention to provide a new and improved locking device for resiliently securing a bridge plate in the inoperative or transit position to protect the locking structure from external forces on the bridge plate.

It is a further object of this invention to provide a locking device for resiliently securing bridge plates in the transit position wherein the work forces generated by bridge plate movement will react from a generally vertically disposed source of work energy through a novel linkage mechanism to maximize the total work forces available to return the bridge plate to a neutral or vertical position after application of external forces thereon.

It is a further object of this invention to provide a new and improved locking device for bridge plates wherein the angularity of bridge plate rotation may be positively controlled by means of a uniquely disposed spring loading mechanism acting through a novel linkage mechanism.

It is a still further object of this invention to provide a new and improved means of mounting a bridge plate in conjunction with a device for securing the bridge plate in an inoperative position including a preloaded spring device which will have a predeterminable amount of working force available to maintain the bridge plate to the neutral position.

Further and fuller objects will become readily apparent when consideration is given to the accompanying drawings wherein:

FIG. 1 is a fragmentary front elevational view of a railway car having a bridge plate mounted thereon, equipped with the bridge plate locking device of the present invention;

FIG. 2 is a top plan view of the device of FIG. 1 taken generally along the lines 2—2 of FIG. 1;

FIG. 3 is a side elevational view with parts in section taken generally along the lines 3—3 of FIG. 1;

FIG. 4 is a front elevational view with parts in section taken generally along the lines 4—4 of FIG. 3;

FIG. 5 is a view similar to the view of FIG. 3 with the bridge plate pivoted to the outboard limit; and

FIG. 6 is a view similar to FIGS. 3 and 5 with the bridge plate pivoted to the inboard limit.

In the front elevational view of FIG. 1, reference character 10 indicates a piggyback type of railway car having a bridge plate 11 (shown fragmentarily) and a bridge plate holder assembly 12 mounted thereon. A fragmentary end sill portion 13 is shown in FIG. 1, being of the form used on low level cars. In the low level types of railway cars, a raised coupler housing 27 is provided at opposite ends of the car to mount the couplers in the line of draft, which as established by A.A.R. standards, is 34 and 1/2 inches from the rail. It is to be understood however, that the present invention is equally applicable to cars of varying design, and is illustrated in connection with a low level car only for the purposes of showing the applicability of the instant device to the more complex existing underframe design.

The end sill 13 terminates in a longitudinally extending deck plate 15 which supports an end sill cover plate 14 extending between a low side portion 26 and the raised coupler housing 27. The bridge plate 11 is held to the railway car by means of a hinge assembly indicated generally at 16, including a transversely extending hinge pin 17 loosely received in a continuous knuckle portion 18 integral with the bridge plate 11. The hinge pin is mounted at its outer end in a suitable fixed mounting lug or bracket member 28, with the inner end portion being received in a leg portion of a U-shaped bracket member 29 to be described more completely hereinafter.

The bridge plate holder assembly 12 includes a locking pin 20 slidably held to a marginal edge of the bridge plate 11 by means of spaced mounting brackets 21 and 22. The lower end portion of the locking pin 20 may be chamfered or rounded to form a guide portion and locking pin socket member 23. One side of the locking pin socket 23 is pivotably mounted on the hinge pin 17 with the opposite side being pivotably mounted by means of a socket hinge pin shown in dotted lines at 24. The particular details of this construction will be described more completely hereinafter in conjunction with FIGS. 2-6.

A suitable bell crank or linkage means, formed by a pair of boomerang shaped members 30 and 31 with one arm attached to the socket 23 along the axis and the other arm attached at an angle with respect to the socket axis, is connected at its outer end to a bridge plate cushioning device indicated generally at 25 in FIG. 1. The lower end portion of the socket 23 is seen through a generally rectangular aperture 32 in the end sill cover plate 14, which serves an additional function to be described in connection with the operation of the device. A reinforcing plate 33 extends from adjacent the top of the aperture 32 along the vertical surface of the end sill cover plate to the vicinity of low side portion 26 to lend rigidity thereto.

Referring now to FIG. 2, the top plan view of the end of the railway car 10 illustrates the mounting bracket 29 as being of generally rectangular configuration and being positioned around the marginal edges of a generally rectangular cutaway portion 34 in the end sill cover plate 14. The rectangular mounting bracket 29 also serves as a rigidifying member to strengthen the area around the rectangular opening 34 in the end sill cover plate 14.

The socket 23 receiving the locking pin 20 (shown in section) is welded to the bell crank means composed of lever arm members 30 and 31 forming a unitary assembly. The arm members 30 and 31 having suitable apertures 35 and 36 adjacent the socket to receive the hinge pin 17 and socket hinge pin 24 respectively with a bearing fit to mount the socket member 23 and arm members 30 and 31 for pivoting movement thereon. The arm members 30 and 31 extend longitudinally of the car and as will be seen in the elevational views of FIGS. 3-6, slightly downwardly converging for joining to a generally vertically disposed connecting lever arm 37 by means of a cross pin 61. The arm members 30 and 31

serve to change rotational motion to generally linear motion acting on the vertically disposed connected lever 37 in a manner to be described in connection with FIGS. 5 and 6.

A continuous threshold 38 extends from adjacent the bracket 29 to the hinge mounting bracket or lug 28 to protect the hinge assembly 16 as vehicles are driven thereover. As more clearly seen in the elevational view of FIG. 3, the threshold 38 provides a slight rise from angulated surface on the end sill cover plate 14 to prevent the hinge pin 17 from becoming damaged by a vehicle being driven against the same. The threshold 38 permits the vehicle wheels to rise so that loading forces are received in a generally vertical direction on the end of the hinge assembly 16 rather than in the direction of vehicle travel.

The threshold 38 has a flange portion 38' which serves as a mounting portion and also as a bearing surface for the continuous knuckle portion 18 of the hinge assembly 16. As was described above, the continuous knuckle portion 18 is received over the hinge pin 17 with a loose fit so that the hinge pin 17 serves only a retaining function. Thus, the outer surface of the knuckle portion 18 rests on the flange 38' of the threshold 38 during bridge plate movement to materially increase the life of the hinge assembly 16. Also, vertical load forces are transmitted directly to the end sill cover plate without passing through the hinge pin 17.

The end sill cover plate 14 is attached to the floor portion 15 by means of welding or the like and comprises a continuous member which extends between the raised coupler housing 27 and the side portion 26 of the railway car. Suitable riser boards may be provided adjacent the end portion 39 of the end sill cover plate 14 to provide sufficient axle clearance on the low level designs having a raised coupler housing 27.

The end sill cover plate has a slightly angulated surface extending from the end portion 39 to the threshold 38. The rectangular opening 34 in the end sill cover plate 14 extends into the angulated surface and accordingly, the mounting bracket 29 is formed of complementary configuration, as is evident in FIG. 3. The lever arms 30 and 31 seen in dotted lines are positioned within the long side portions of the rectangular mounting bracket 29 when the locking pin socket 23 is in the neutral position, thereby protecting the arm members 30 and 31 from damage if a vehicle should accidentally pass over them during loading and unloading operations.

The bell crank arm members 30 and 31 are connected to the vertically disposed connecting lever 37 forming a part of the cushioning device indicated generally at 25. As seen in FIGS. 3 and 4, the cushioning device 25 includes a cylindrical guide member 40 having an upper collar portion 41 adjacent the upper end thereof. An end cover plate 42 is welded to the upper end of the guide member 40 and the lower end of the vertical connecting lever 37 to provide an integral assembly. The lower end of the guide member 40 is provided with a lower collar member 43 which is welded to the guide member in the manner of the upper collar 41.

A mounting bracket is provided to form a guide means for the guide member 40 and includes a vertically disposed plate member 44 welded to the underside of the floor 15. A second plate member 45 is welded to the marginal edge portion of the bottom cover plate 46 of the center sill with transverse rigidification of both plates provided by a cross plate member 47. A generally U-shaped pivoting guide bracket 48 is carried between the spaced plate members 44 and 45 by means of bearing bolt members 49 and 50 which permits the channel-shaped pivoting guide bracket 48 to move in response to slight angularity changes of the guide member.

A spring member 51 is disposed around the guide member 40 and has the upper end in abutment with a spring follower plate member 52 which has a central aperture

53 of sufficient diameter to slide smoothly along the outer circumferential surface of the guide member 40. The inside diameter of the aperture 53 is slightly greater than the outside diameter of the guide member 40 however, is lesser in diameter than the outside diameter of the collar member 41 for purposes to become apparent when the operation of the present invention is described. A lower spring follower plate 54 is provided in abutment with the bottom end of the spring member 51 and is also provided with a central aperture 55 of sufficient dimension to slidably receive the guide member 40. As was true in the case of the upper spring follower member, the lower spring follower plate 54 is provided with an aperture 55 of slightly greater diameter than the guide member 40, however of lesser diameter than the outside dimensions of the lower collar member 43 affixed to the guide member 40. The upper and lower spring follower plates 52 and 54 are interconnected by means of a pair of long bolts 56 and 57 which also pass through appropriate apertures in the channel shaped pivoting bracket 48. A double nut arrangement indicated generally at 58 and 59 holds the long bolts 56 and 57 to the upper spring follower plates 52 so as to be movable therewith.

The bottom spring follower plate 54 is provided with apertures 60 which allow the long bolts 56 and 57 to slide relative to the plate 54. As illustrated in FIGS. 3 and 4, the cushioning device 25 is in the unstressed or neutral position, occurring when the locking pin 20 and associated bridge plate 11 are in the vertical or transit position and no external forces are applied.

The operation of the device can be best described with reference to FIGS. 5 and 6. As pointed out above, various types of dynamic forces arise in the operation of the car which tend to rotate the bridge plate about its hinge pin. The present locking device resiliently secures the bridge plate in an upright position allowing limited pivoting or rotational movement about the hinge axis, with suitable means provided to capture and dissipate the dynamic forces generated by bridge plate movement. A portion of the force is used to return the bridge plate back to the neutral or vertical position.

Assume in FIG. 5 that some force has acted on the bridge plate (shown fragmentarily at 11) to cause it to swing outwardly over the end sill portion. Such movement is transmitted through the locking pin 20 to the locking socket 23. This causes the bell crank levers 30 and 31 to rotate in an upwardly direction, drawing the vertical connecting lever 37 upward through the pivoting connection 61. The guide member 40 slides upwardly through the upper spring follower 52, and in so doing moves away from the U-shaped pivoting guide bracket 48 drawing the lower collar 43 and the bottom spring follower plate 54 upwardly. The spring member 51 is compressed between the follower plates 42 and 53 since the upper follower plate 52 is held from upward movement by means of the long bolts 56 and 57 thereby providing a source of force to return the bridge plate 11 to the neutral position.

It is contemplated that the spring 51 can be pre-compressed to any degree to provide the necessary initial resisting force. For example, in one concrete embodiment, the spring 51 was precompressed to make about 300 pounds of force available upon initial spring movement. Thus, a substantial force is available acting through the linkage means to maintain and restore the bridge plate 11 in the vertical position. A suitable cutout portion 62 is provided in the car deck 15 in order to pass the connecting plate 42, the guide member 40 and associated upper collar 41. The cutaway portion 62 is wider than it is long in order to pass the connecting plate 42. As seen in FIG. 4, the connecting plate 42 is slightly offset with respect to the center lines of the guide member 40 due to mechanical geometric restrictions which require the connecting lever 37 to be joined slightly off center. No reinforcing is required around the cutaway portion

62 of the floor 15 since the end sill cover plate protects it from being loaded directly.

It is to be observed that throughout bridge plate movement the cushioning device 25 is maintained substantially at right angles to the lever arms 30 and 31 in order to gain maximum operational advantages therefrom. In addition, the mounting arrangement permits the device to be used on virtually all known types of piggyback cars without requiring substantial modification. As seen in FIG. 5, the spring force operates through the lever arms 30 and 31 substantially at right angles thereto, in order that the available component of work force is at a maximum value to urge the bridge plate 11 back to the neutral position. For example, with the present vertical mounting arrangement, when the bridge plate swings inwardly about 20° or outwardly about 45°, the total torque available to return the bridge plate to the neutral position is maximized, being somewhat greater at the position of greatest angularity.

The travel of the bridge plate 11 may be limited to any desired angularity. In the present embodiment, the outer limit is established when the top connecting plate 42 engages the underside of the bracket member 29 and further bridge rotation is impossible. At this point the bridge will be angulated with respect to a vertical axis approximately 45°. Adjustment of the angularity of the outer limit may be effected in various manners, for example, by controlling the length of the vertical connecting lever 37.

As seen in FIG. 6, the bridge plate 11 has swung inwardly toward the central portion of the car with the total angular swing being about 20° from a vertical plane. The inward pivoting movement of the bridge plate 11 causes the socket member 23 to move in a circular path with the lower end abutting the end sill cover plate 14 to establish the inboard limit. The cutaway portion or aperture 32 in the end sill cover plate 14 allows the pin member to extend slightly therethrough, if necessary to provide a full 20° movement. The stop may be readily adjusted to accommodate desired angularity by reducing or increasing the amount of material removed. The pin and socket may also be shortened slightly to obviate the need for an aperture in the end sill. In the present case, the aperture is of such small dimension that stress concentration caused thereby is insignificant.

At the maximum limit of inboard travel of the bridge plate, the arm members 30 and 31 force the lever 37 through the aperture 62 causing the guide member 40 to move in a downward direction. As pointed out previously, the collar 41 is of greater diameter than the opening 53 in the spring follower plate 52 thereby forcing it downwardly with the guide member 40. Since the long bolts 56 and 57 are attached to the spring follower plate, they also move in a downward direction through the pivoted mounting bracket 48, causing the same to seek a position at right angles to the direction of guide member travel. Throughout this movement, the lower spring follower plate 54 is in abutment with the pivoted mounting bracket 48 preventing movement of the lower end portion of the spring 51. As a result, the spring 51 is compressed between the upper and lower follower plates 52 and 54 damping bridge plate movement and storing energy generated as a result of the bridge plate rotation.

When dynamic forces acting on the bridge plate 11 are relieved, the spring member 51 acting against the upper follower plate 52 restores the guide member and bridge plate to the neutral position. Throughout movement in either direction, the cushioning device 25 serves to absorb and resist the dynamic loading forces on the bridge plate 11, allowing it to swing slightly in response to external forces such as car impacts, wind loading forces, impacts from vehicle contact and the like. Thus, the hinge assembly, bridge plate and locking structure is protected in a cushioned manner at all times, while suitable limits are provided to control the maximum

amount of bridge plate movement to protect the lading. Limitations of bridge plate movement of 20° inwardly, and 45° outwardly are arbitrary limits that have been found satisfactory in practice, however, it is to be understood that any desired angularity could be maintained within the limits of the total spring travel.

Obviously, other modifications could be made without departing from the inventive concepts embodied herein. Therefore any limitations imposed are to be within the spirit and scope of the appended claims.

I claim:

1. In a railway car having an end sill portion and a deck portion, a bridge plate pivotably mounted above said deck portion adjacent said end sill, a locking pin slidably disposed along a marginal edge of said bridge plate, a locking pin socket having the central axis thereof in a substantially vertical plane for reception of said locking pin when said bridge plate is in a transit position, bell crank arm means joined to said socket at an angle with respect to said axis, said bell crank arm means and said socket being mounted on said railway car for rotation about an axis substantially in line with the pivotal axis of said bridge plate, bridge plate cushioning means connected to said bell crank arm means, said bridge plate cushioning means including a generally vertically disposed guide member, spring follower means on opposite ends of said guide member, spring means interposed between said follower members, and means cooperating with said follower members for compressing said spring in response to movement of said guide member and said bridge plate whereby said bridge plate will return to a substantially vertical position in the absence of external forces.

2. In a railway car having an end sill portion and a deck portion, a bridge plate pivotably mounted on said deck portion adjacent said end sill for movement between a generally horizontal use position and a generally vertical transit position, a locking pin slidably disposed along a marginal edge of said bridge plate, a locking pin socket mounted on said deck portion and having the central axis thereof in a substantially vertical plane for reception of said locking pin when said bridge plate is in said transit position, bell crank arm means joined to said socket at an angle with respect to said axis, said bell crank arm means and said socket being rotatable about an axis transverse of the central axis of said socket a guide member having an integral lever at the upper end thereof, said lever being pivotably connected to said bell crank arms, said guide member being disposed in substantial parallelism with the axis of said socket when no force is applied thereto, said guide member having a spring coaxial therewith, guide means slidably mounting said guide member beneath said deck portion, and means cooperating with said guide member and said guide means for compressing said spring in response to pivoting of said bridge plate when the latter is in said generally vertical transit position.

3. Means for securing a bridge plate in an inoperative position comprising, in combination, a vehicle transporting car having a deck portion, an end sill portion at one end of said floor portion, a cutaway portion in said floor adjacent said end sill, a bridge plate hingedly mounted for pivoting movement on said deck portion for movement between a generally horizontal use position and a generally vertical transit position, a locking pin on said bridge plate, a locking pin socket mounted on said deck portion for pivoting movement about an axis substantially in line with the pivot axis of said bridge plate and further being adapted to receive said locking pin, bell crank arm means attached to said socket and extending away from said end sill, bracket means mounted beneath said floor in substantial vertical alignment with said cutaway portion, a pivoting guide means carried by said bracket means, a guide member having one end thereof slidably received in said guide means and the opposite end

thereof connected to said bell crank arm means and spring means carried by said guide member and adapted to be compressed in response to movement of said guide member when said bridge plate is in said generally vertical transit position thereby to return said bridge plate to a neutral position.

4. In a railway car having a deck portion and a bridge plate having a locking pin thereon and being hingedly mounted on said deck portion for movement about said hinged mounting between a generally horizontal use position and a generally vertical transit position, the provision of locking device for receiving said locking pin including a locking pin socket mounted for pivoting movement on said car about an axis which is substantially co-extensive with the hinge axis of said bridge plate, bell crank arm means extending angularly from said socket, and cushioning means connected to said bell crank arm means, said cushioning means being mounted beneath said deck portion for vertical movement, said cushioning means including a spring means having the central axis thereof in a substantially vertical plane when said bridge plate is in a neutral position, and follower means forming a part of said cushioning means for compressing said spring means in response to angular movement of said bridge plate when the latter is in said generally vertical transit position.

5. In a railway car of the low level type having a low side portion and a raised coupler housing, a deck portion extending between said side portion and said raised coupler housing, an end sill cover plate mounted over said deck portion and extending between said raised coupler housing and said low side portion, a bridge plate mounted on said end sill cover plate for angular movement about an axis extending generally transversely of said car, a locking pin slidably carried by said bridge plate, a vertically disposed locking pin socket mounted on said end sill cover plate for angular movement about a second axis substantially in line with said bridge plate axis, bell crank arm means attached to said locking pin socket and extending in a generally horizontal direction from said socket, an aperture in said end sill cover plate portion and a cutaway opening in said deck portion in substantial vertical alignment with an end portion of said bell crank arm means, a pivoting guide means in substantial vertical alignment with said cutaway opening in said deck portion and being carried by said car, a guide member having one end connected to said bell crank arm means with the other end slidably received in said pivoting guide means, spring means on said guide member, and follower means for compressing said spring means in response to angular movement of said bridge plate when said locking pin is received in said locking pin socket.

6. The railway car of claim 5 wherein said bridge plate is mounted on said end sill cover plate by means of hinge assembly including a hinge pin secured to said end sill cover plate, and a continuous knuckle portion on said bridge plate surrounding said hinge pin, said continuous knuckle portion being loosely received on said hinge pin so that the outer portion thereof rests on a plate means overlying said end sill cover plate.

7. The railway car of claim 6 wherein said plate means includes a threshold to protect said hinge assembly from vehicles driven thereover.

8. A locking device for resiliently securing a bridge plate in an inoperative position, comprising a railway car having a deck portion, means hingedly mounting a bridge plate above said deck portion for angular movement between a generally horizontal and upright position, a locking pin receiving socket pivotally mounted on an axis in substantial axial alignment with the axis of angular movement of said bridge plate, a pair of arms joined to and extending from said locking pin receiving socket, an elongated guide member having one end pivotally joined to said arms, resilient means adapted to receive said guide

member in vertical loading relationship thereto to resist angular movement of said arms, said resilient means including a bracket disposed below said arms, a pivoting guide means carried by said bracket, said guide means receiving said guide member, a spring surrounding said 5 guide member and engaging said guide means, and follower means engaging the opposite end of said spring to load the spring vertically in response to angular bridge plate movement.

References Cited by the Examiner

UNITED STATES PATENTS

2,911,925	11/59	Adler et al.	105—376
3,063,386	11/62	Price	105—458

ARTHUR L. LA POINT, *Primary Examiner*.
LEO QUACKENBUSH, *Examiner*.