Feb. 24, 1942. B. F. FITCH 2,273,854

DEVICE FOR POSITIONING CONTAINERS ON VEHICLES

Filed April 15, 1940 3 Sheets-Sheet 1

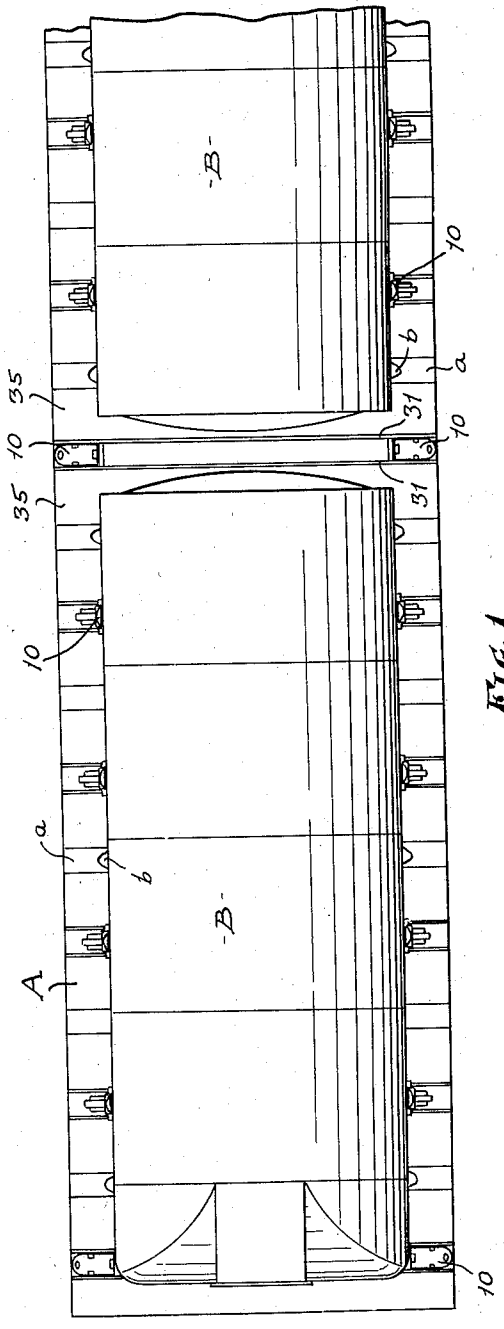


Fig. 1

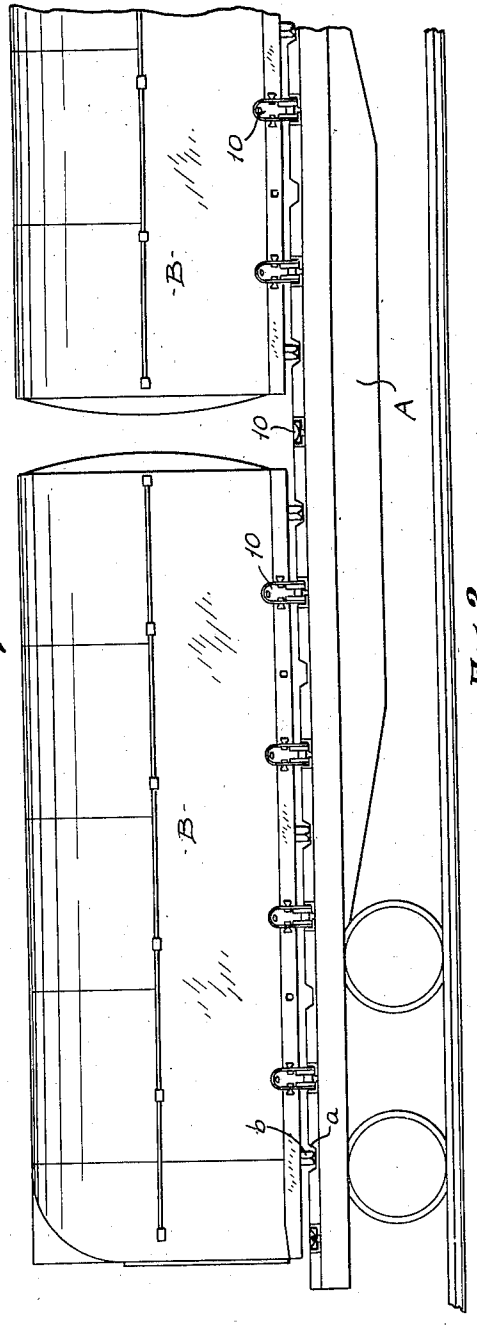


Fig. 2

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Filed April 15, 1940 3 Sheets-Sheet 2

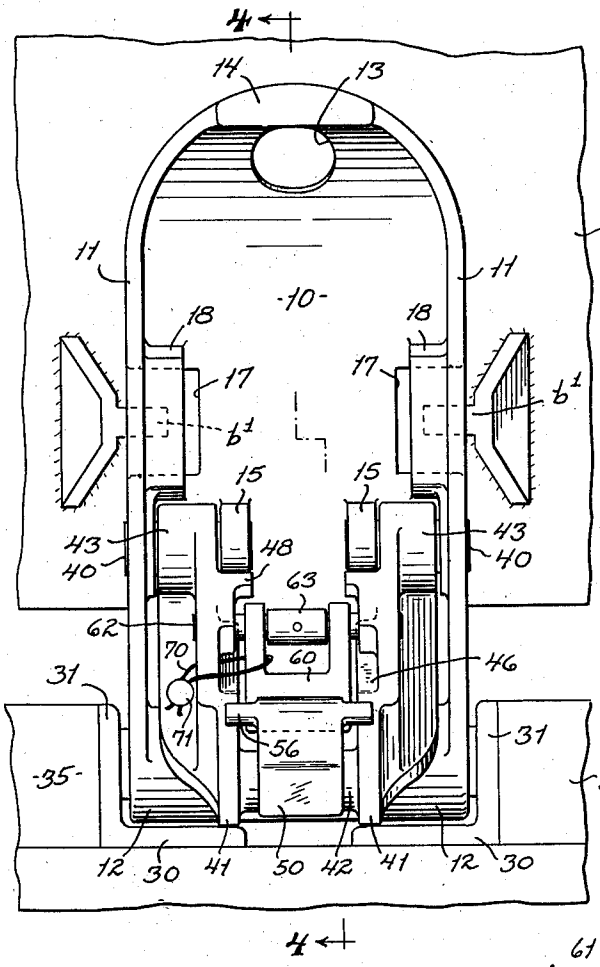


FIG. 3

FIG. 4

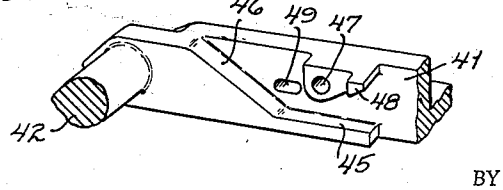


FIG. 5

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DEVICE FOR POSITIONING CONTAINERS ON VEHICLES

Filed April 15, 1940 3 Sheets-Sheet 3

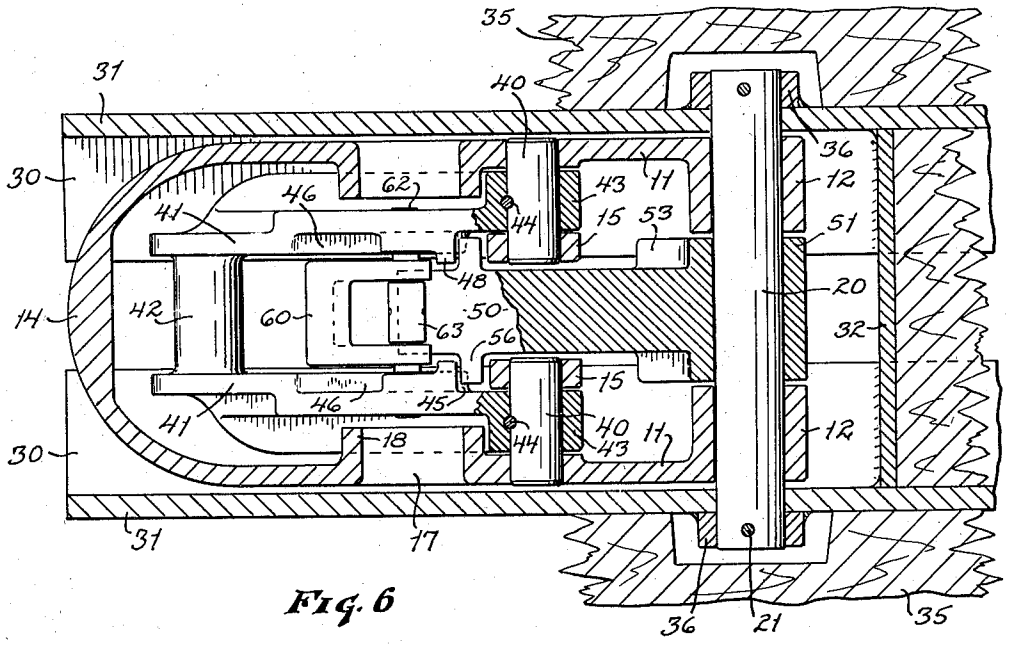


Fig. 6

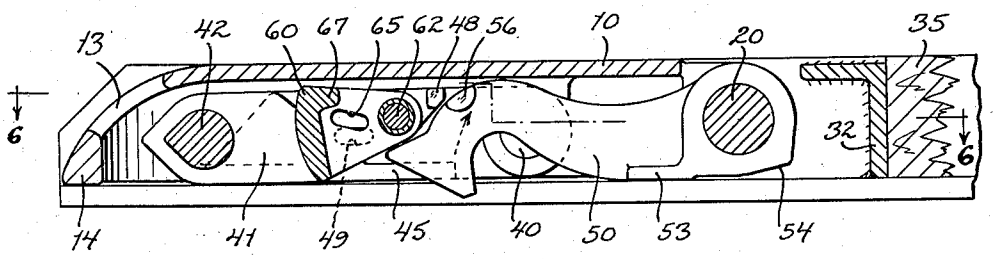


Fig. 7

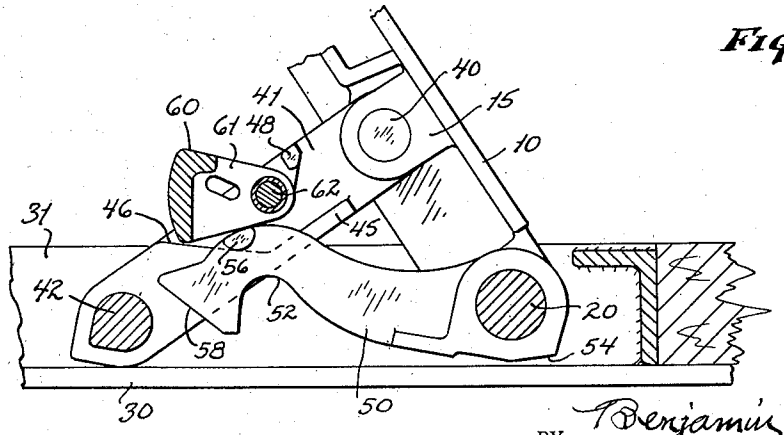


Fig. 8

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UNITED STATES PATENT OFFICE

2,273,854

DEVICE FOR POSITIONING CONTAINERS ON VEHICLES

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Application April 15, 1940, Serial No. 329,668

16 Claims. (Cl. 105—366)

This invention is concerned with the handling of freight in demountable containers which are adapted to be carried interchangeably by a highway truck or a railway car, and shifted by approximately horizontal movement from one to the other.

This invention is in the nature of an improvement of Patent No. 2,114,707, of Benjamin F. Fitch and Ragnar A. Norbom, issued April 19, 1938. In that patent, there is disclosed a railway car provided with a row of positioner devices parallel with its longitudinal edge and pivotally attached to the car some distance inward from such edge in a position adapted to lie down flush with the top of the car so that the interchangeable body may be skidded over them into position on the car. After thus placing the demountable body, the positioners are turned to upright position to hold the body in place.

Each positioner in the patent mentioned comprises, in addition to the pivotally mounted abutment member, a pair of links pivoted to the under-side of the member, adapted to lie beneath it when the member is horizontal, or stand in an inclined position to act as bracing struts when the member is vertical, and a hook to engage a cross-bar on the free ends of the struts and anchor such struts when the member is vertical.

In the prior patent, gravity was relied upon to hold down the free ends of the struts and their cross-bar down on the frame during the raising movement of the top member, so that the cross-bar would slide beneath an inclined nose on the hook and cam it upwardly after which it dropped by gravity with its hook portion in front of the cross-bar, thus anchoring the free ends of the struts to enable them to retain the member effectively in upright position.

While the gravity operation of the prior patent normally operated in the intended manner above mentioned, it was possible by throwing the top member too vigorously into its upright position, to bounce the strut and cross-bar member so that the cross-bar failed to ride beneath the nose of the hook, but on the contrary, rode on top of it, preventing the anchoring action described. Also in the case of dirt or ice on the different parts of the mechanism, it might sometimes happen that the parts would cling to the under-side of the abutment member so that the whole mechanism would lift as a unit.

It is the object of this invention to render the action of the positioning device absolutely positive and prevent the possibility of occasional improper action due to the manner of manipulation, or to an accumulation of snow, ice or dirt.

In accomplishing this object, I have provided a limit to the upward swing of the hook, so that its hooked portion may rise only slightly higher than the cross-bar on the strut, and I have provided a sliding connection between the hook and the struts with the result that when the abutment member is swung up it can carry the hook point with it only a slight distance, and then must leave the hook in its approximately horizontal position; also the sliding engagement of the hook with the links comes into play so that the free ends of the struts are positively prevented from rising. Thus the lower ends of the struts are compelled to travel inwardly in a substantially horizontal plane toward the hook and beneath it as the abutment member comes into upright position. This makes the action positive instead of relying on gravity, as heretofore.

The prior patent shows a dog pivotally carried by the links and adapted to fall by gravity, or by shoving, over the positioning hook. It was possible, however, in the prior patent, to tip the dog back so far that gravity did not swing it down. In the present invention, I provide means on the links to prevent such action, so that the dog always tends to come by gravity into its active position.

It is frequently desirable to lock the positioners with car seals when they are in their active position. To this end, I now provide an opening through the locking dog adapted to register with an opening provided in one of the links when the dog is in locked position, these registering openings allowing the application of a car seal to seal the positioner in its active position.

By reason of the seal it is possible to allow the dog to be held in locked position without actually engaging or jambing against the top of the hook, as shown in the patents; hence the dog is equally effective for preventing the hook releasing the struts without danger of the dog jambing so tightly against the hook that it is difficult to swing it out manually.

The invention covers the improvements above referred to, as illustrated in the drawings hereof, and as hereinafter more fully described, and as summarized in the claims.

In the drawings, Fig. 1 is a plan and Fig. 2 is a side elevation of a railway car equipped with my positioners, most of which are shown in their upright active position engaging the sides of tanks on the car, some of the positioners however being illustrated in idle position; Fig. 3 is an

elevation in a larger scale of one of the positioners in its active position engaging the side of a container, a portion of which is shown in the view; Fig. 4 is a vertical section of the positioner when it is standing vertically as indicated by the line 4—4 on Fig. 3; Fig. 5 is a detail in perspective of a portion of one of the struts and its cross-bar; Figs. 6 and 7 are horizontal and vertical sections respectively, of the positioner when in idle position, Fig. 6 being a section on an offset plane as indicated by the line 6—6 on Fig. 7; Fig. 8 is a fragmentary view showing the abutment member, strut, hook and dog in an intermediate position, illustrating the action in moving the abutment member from horizontal to vertical position.

In Figs. 1 and 2, A represents a railway flat car having suitable upwardly facing channels *a*; B represents containers having skid rails *b* on their base adapted to occupy the channels. Thus the containers may be skidded from an adjacent support, as for instance a highway truck, onto the car, and are then held by the channels against longitudinal movement. In such placing operation, the positioners on the far side of the car are elevated to form abutments limiting the movement, while the positioners on the near side are horizontal so that the container is readily shoved across them. Thereafter the positioners on the near side of the car are raised to active position, thus locking the container against movement in either direction transversely.

The abutment member of the positioning device comprises a casting 10 pivotally mounted on a cross-rod 20, which is carried by the car. Two angle beams having horizontal flanges 30 and vertical flanges 31 are rigidly mounted on the car transversely thereof, in facing relation to each other. A suitable inverted angle 32 is mounted between the vertical flanges 31 and welded thereto. The outer faces of the vertical flanges 31 and 32 may form abutments for the floor planking 35 of the car. Secured to the outer side of the vertical flanges 31, preferably by welding, are bosses 36. The vertical flanges 31 and the bosses make effective supports for the cross-shaft 20, which is shown as fixed to the bosses by pins 21.

The abutment casting 10 is a hollow channel-shaped member facing downwardly when the member is horizontal, and open at the bottom. The member has a substantially continuous top plate, nearly filling the distance between the flanges 31, and on the under-side this top plate has vertical flanges 11 which at the rear end are formed into inwardly extending hollow bosses 12, which surround the stationary shaft 20. At its free end the top curves downwardly to the bottom of the member. A hand hole 13 is provided through this curved portion, this leaving a cross-bar 14 on this member which may be readily grasped by the operator's hand to lift the member to swing it upwardly on the shaft 20.

Extending downwardly from the top plate of the abutment member 10 are a pair of ears 15. Journalled in these ears and in the flanges 11 are a pair of short shafts 40 carrying the struts referred to. The two struts and their connecting cross-bar are preferably one integral member, this member, as shown, comprising the two strut arms 41 and the cross bar 42. The strut arms 41 are formed with bosses 43 snugly embracing the shafts 40 and locked to them by pins 44.

The hook 50 is freely pivoted on the shaft 20, being widened at such region, as shown at 51, and is formed on its underside with a recess 52 designed to embrace the cross-bar 42 of the strut member, thereby retaining the abutment member 10 in its active position, as shown in Fig. 4. The hook 50 adjacent its widened rear end 51 is formed with wings 53 (Fig. 6) extending in each direction adjacent its bottom. These wings overlap the horizontal flanges of the channel-beams 30, and limit the downward movement of the hook, so that when idle it stands in the position shown in Fig. 7. The upward movement of the hook is limited by a slightly inclined flattened under-portion of the rear or widened tubular portion, as indicated at 54, in Fig. 7. Thus the hook has a possible swinging movement merely enough to enable it to pass freely over the cross-bar 42 of the strut member.

Each strut arm 41 is formed on its inner face with a ledge 45 which extends first parallel with the under-face of the strut member, and then inclines upwardly as shown at 46. The hook is provided adjacent its free end on opposite sides with lugs 56 overhanging the ledges 45 and 46. The result of this is that as the abutment member is being swung up from its horizontal position, indicated in Fig. 7, toward the vertical position of Fig. 4, the ledge 45 traveling at its rear end in an upwardly inclined path, as indicated by the arrow in Fig. 7, comes into engagement with the lug 56 on the hook, thus positively lifting the free end of the hook. The limit of the lift is provided by the flattened rear end 54 of the hook engaging the horizontal flanges of the angle bars 30. However, before the latter engagement ordinarily takes place, and as the abutment member continues to move, the ledges 46 must ride along on the under-side of the lugs 56, the free end of the strut member moving substantially on the horizontal flanges of the angle bar 30. Thus the cross-bar 42 of the struts moving inwardly in a horizontal plane, comes beneath the inclined face 58 of the hook nose before the hook lugs 56 clear the strut ledges 46.

Before the lugs 56 clear the front of the ledges, the cross-bar 42 will be below the incline 58, so that the further movement of the free end of the struts cams the hook upwardly, and just before it reaches the upward limit of its movement (caused by the flattened rear portion 54) the cross-bar passes beneath the hook nose and is thus directly beneath the recess 52. The unsupported free end of the hook now drops into the final position illustrated in Fig. 4, thus firmly anchoring the free ends of the struts and holding the abutment member in upright position.

The locking dog 60 comprises a stirrup-shaped member having its side arms 61 mounted on a pivot pin 62 extending into openings 47 (Fig. 5) in the strut arms. The strut arms have bosses on their inner faces about the openings so that the stirrup arms are positioned free from the strut arms. A suitable intermediate sleeve 63 embracing and pinned to the pin 62 prevents lateral shifting of the dog. The bosses on the inner faces of the strut arms carry projections 48 which are in position to be engaged by the stirrup arms 61 and thus act as stops thereby preventing the dog being thrown upwardly so as to carry the center of gravity beyond its pivot. The tendency of the dog therefore is always to swing downwardly, and when in its downward position the dog hangs over the hook, as shown in Fig. 4, and prevents the hook being raised.

When the positioner is in its idle position, the

dog extends freely in a horizontal direction in front of the hook as shown in Fig. 7. As the positioner is being raised, the struts move rearwardly with reference to the hook, and the dog rides rearwardly on top of the hook, as indicated in Fig. 8, until the abutment member becomes vertical. Thereupon the dog swings by gravity into the position over the hook shown in Fig. 4.

To lock the dog in its active position over the hook, I provide an opening **65** in one of the arms of the dog, which when the dog is active may register with an opening **49** in the adjacent strut arm, and through these two registering openings **65** and **49** a wire **70** may be passed and sealed by a car seal **71**.

With the dog hanging freely over the hook, as shown in Fig. 4, if it is desired to raise it, to lower the positioner, it is simply necessary for the user to insert his fingers between the arms **61** of the stirrup and catch hold of the ledge **67** on the forward portion of the bottom of the stirrup and swing the dog out to release the hook; then the hook is raised by manual engagement at its forward end until such forward end is above the strut cross-bar **42**, after which the abutment member may be lowered to horizontal position.

It will be seen from the description given that my positioner is so designed that it must be positive in its action. When the positioner is idle, it lies flat with its top flush with the floor of the car as illustrated in Fig. 7, and in the case of those positioners which are in the region between the containers in Figs. 1 and 2. Whenever it is desired to raise the positioner to active position, it is merely necessary to grasp the bar portion **14** at the free end thereof, and swing it upwardly, this action necessarily resulting in the cross-bar of the strut member traveling inwardly in a horizontal plane and passing beneath the hook, which descends over it and is thereafter held by the dog.

Neither the hook nor the free ends of the links may be tipped up materially beyond the positions required for their movement. Hence no matter how much snow, ice or dirt may be on the mechanism, the parts are swung properly during the movement, nor is it possible to throw them out of action by abruptness of operation.

If desired, the abutment member may be provided on its face with recesses to coact with projections on the container to prevent the container being bounced materially upward on the car. I have illustrated such openings in the positioner at **17**, the positioner having reinforcing webs **18** about the openings. These recesses are shown in Figs. 3 and 4 as receiving projections b^1 on the side of the container.

I claim:

1. The combination with a support of a positioning member hingedly carried thereby adapted to be folded down into a substantially horizontal position or swung up into a substantially vertical position, a strut pivotally connected to the positioning member, an anchor adapted to engage the free end of the strut when the member is vertical, and means carried in part by the anchor and in part by the strut to positively limit upward movement of the free end of the strut during the upward swing of the abutment member.

2. The combination of a vehicle, a positioning member anchored thereto and adapted to be folded down or stand upright, a pair of struts pivotally secured to the positioning member and connected by a cross-bar, a movable hook pivotally secured to the vehicle adapted to engage the cross-bar to lock the positioning member, and means independent of the struts to limit the upward movement of the free end of the hook during the upward movement.

3. The combination of a support, an abutment member pivotally mounted thereon adapted to stand horizontally or vertically, a strut pivoted to the abutment member having a free end adapted to travel substantially horizontally as the abutment member is swung up from horizontal to vertical position, a hook to engage the strut to anchor its lower end when the abutment member is vertical, and means to limit the upward movement of the free end of the strut and the upward movement of the hook during such action.

4. The combination of a vehicle, a positioning member hinged thereto adapted to be folded down or stand upright, a strut pivotally secured to the positioned member to place it in upright position, a movable member to engage the lower end of the strut and anchor it in such position, means to limit the upward movement of said movable member, and interengaging means carried by the movable member and strut to limit the upward movement of the free end of the strut.

5. The combination of a support, an abutment member pivotally mounted thereon adapted to stand horizontally or vertically, a strut pivoted to the abutment member having a free end adapted to travel substantially horizontally as the abutment member is swung up from horizontal to vertical position, means having a limited upward movement to engage the strut to anchor its lower end when the abutment member is vertical, a coacting sliding connection between the anchoring means and the strut to limit the upward movement of the free end of the strut during such action.

6. The combination of a vehicle, a positioning member pivotally mounted thereon and adapted to be folded down or stand upright, a pair of struts pivotally secured to the positioning member and connected by a cross-bar, a movable hook pivotally secured to the vehicle adapted to engage the cross-bar to lock the positioning member, an interacting ledge on one of the struts and a projection on the hook, and means whereby a part of the hook cooperates with some part of the vehicle to hold the free end of the hook against undue vertical movement during the positioning action.

7. The combination with a support of a positioning member hinged thereto on a horizontal axis and adapted to be folded down or raised to upright position, a pair of links pivoted to the positioning member and having a cross-bar at their free ends, a hook pivoted to the support adapted to engage the cross-bar, said links having ledges on their inner faces and the hook having projections at its side adapted to overlie the ledges, and means to limit the upward movement of the hook.

8. The combination with a support of a positioning member hinged thereon on a horizontal axis adapted to be folded down or raised to upright position, a pair of links pivoted to the positioning member and having a cross-bar at their free ends, a hook pivoted to the support adapted to engage the cross-bar, at least one of said links having a ledge on its inner faces and the hook having a projection at its side adapted to overlie the ledge, and means to limit the upward movement of the free end of the hook.

9. The combination of a support, a positioning member hinged thereto and adapted to lie idle or stand vertical, a movable brace pivoted to the positioning member having a free end, a hook pivotally carried by the support and adapted to ride over a cross-portion of the free end of the brace, the brace having an inwardly facing ledge extending in an inclined position across it, the hook having a projection overlying said ledge, and means to limit the upward movement of the hook.

10. The combination with a support having a horizontal portion with vertical flanges, a shaft mounted in the vertical flanges, a positioning member mounted on the shaft adapted to swing about the axis of the shaft from a substantially horizontal to a substantially vertical position, said positioning member being hollow on its under-side, a hook pivotally mounted on said shaft, a pair of struts pivotally connected to the positioning member on opposite sides of the hook and having a cross-bar beyond the end of the hook when the device is idle, said struts having ledges on their inner faces, said hook having lugs on its opposite sides overlying the ledges, said ledges extending substantially parallel with the under-face of the struts for a distance and then inclined upwardly, said hook having a portion back of its pivoted axis adapted to coact with the horizontal portion of the support, whereby the support limits the upward swing of the free end of the hook and the lugs on the hook limit the upward swing of the cross-bar of the struts.

11. The combination of a support, a pair of angle bars carried thereby with inwardly facing bottom flanges and vertical flanges adjacent their outer edges, a cross-shaft carried by said vertical flanges, a positioning member pivotally mounted on the cross-shaft leaving an intermediate space about the shaft, a hook mounted on the shaft in such intermediate space and having wing portions adapted to overly the horizontal flanges of the angle bars at the front of the pivotal axis to limit the downward movement of the hook and having flattened portions overlying such flanges at the rear of the pivotal axis to limit the upward movement, a strut member pivotally secured to the under-side of the abutment member having a pair of arms and a cross-bar, said hook having its nose upwardly inclined on the under-side toward the front to engage and ride over the cross-bar of the strut.

12. The combination with a support, of a positioning member hinged thereto on a horizontal axis and adapted to fold down or be raised to upright position, a pair of links pivoted to the positioning member having a cross-bar connecting their free ends, a hook pivoted to the support adapted to hook over the cross-bar when the member is upright, a dog pivotally carried by the two links between them and adapted to depend over the hook without engaging it when the hook is in engagement with the cross-bar, said dog and one of the links being formed with openings adapted to register when the dog is in such depending position, whereby a car seal may be passed through said such openings and lock the dog in position.

13. The combination of a vehicle, a positioning member hinged thereto adapted to be folded down and to stand upright, a pair of links pivotally secured to the positioning member and connected together by a cross-rod, a movable hook operatively secured to the vehicle and adapted to engage said cross-rod to lock the positioning member in upright position, and means including a shoulder on the hook coacting with some part of the vehicle to limit the upward movement of the hook to insure the cross-rod passing beneath the hook when the positioning member is raised.

14. A body positioning device for a vehicle, comprising a pivotally mounted abutment member, a strut pivotally connected thereto for bracing the abutment member, a pivotally mounted hook adapted to hook over a portion of the strut to lock the strut, means whereby a part of the hook cooperates with some part of the vehicle to limit the upward movement of the hook and inter-engaging members on the hook and strut for causing the hook to hold down the strut before the hook engages the member on the strut which it is to hook over.

15. A body-positioning device for a vehicle comprising a frame, an abutment member pivoted thereto, a strut pivoted to the abutment member, a hook pivoted to the frame and adapted to act on the strut to hold the abutment member in an upright position, lateral projections from the sides of the hook and coacting ledges on the strut adapted to cause the strut to remain in engagement with the hook until the hook engages that portion of the strut which it is to hook over, and means whereby a part of the hook cooperates with some part of the vehicle for limiting the upward movement of the hook.

16. The combination of a vehicle having a platform, a positioning member hinged thereto adapted to stand upright and to be folded down within the limits of the platform substantially flush with its top surface, a strut pivotally secured to the positioning member to brace it in the upright position, a movable member to engage the lower end of the strut and lock it in such position, and mechanism carried in part by the strut and in part by said movable member to insure the lower end of the strut traveling in a substantially horizontal direction when the positioning member is raised.

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