Jan. 31, 1956 R. O. BALOGH 2,733,039

VEHICLE MOUNTED TRANSPORT CLAMPS

Filed June 19, 1952 3 Sheets-Sheet 1

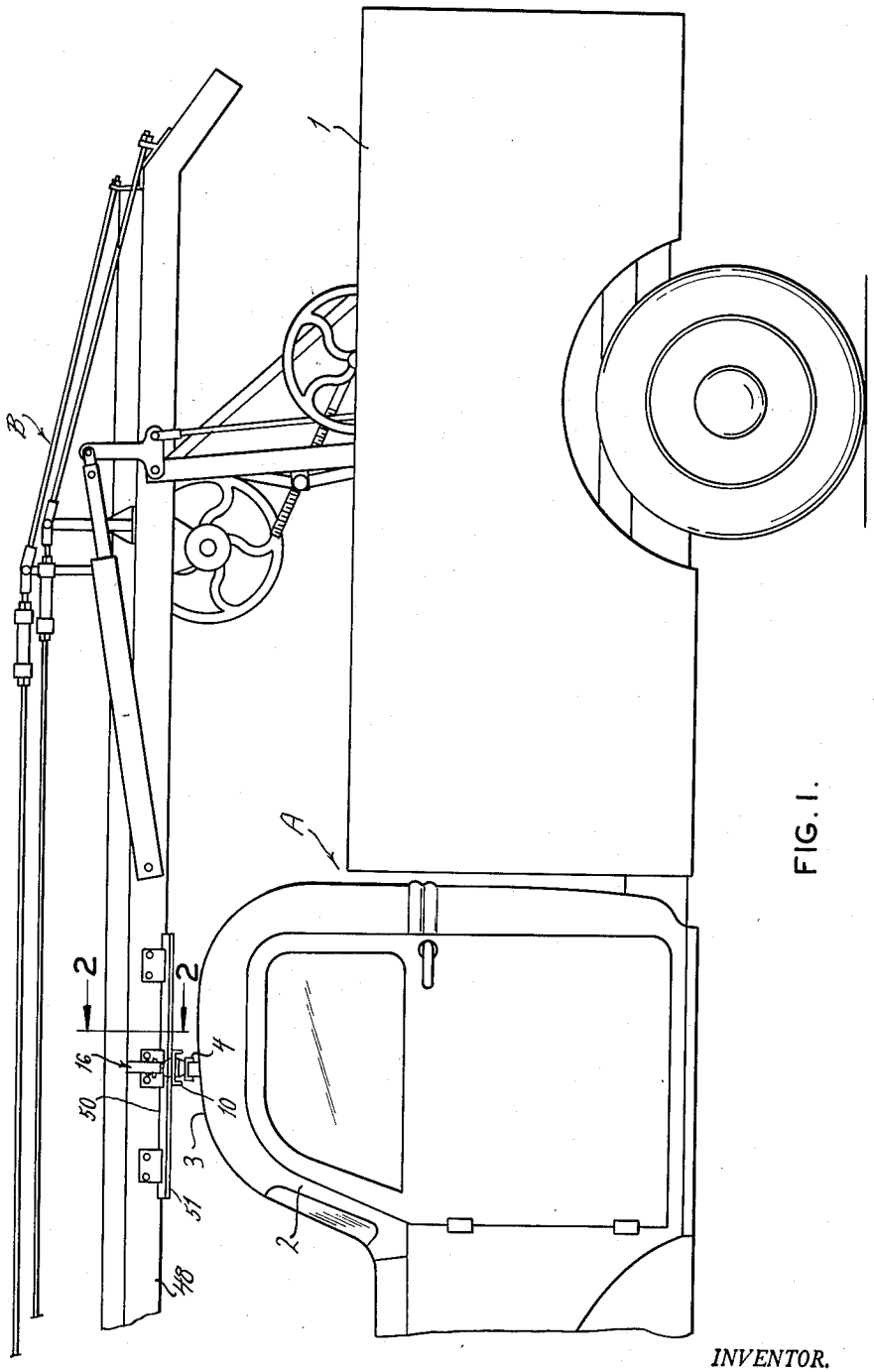


FIG. 1.

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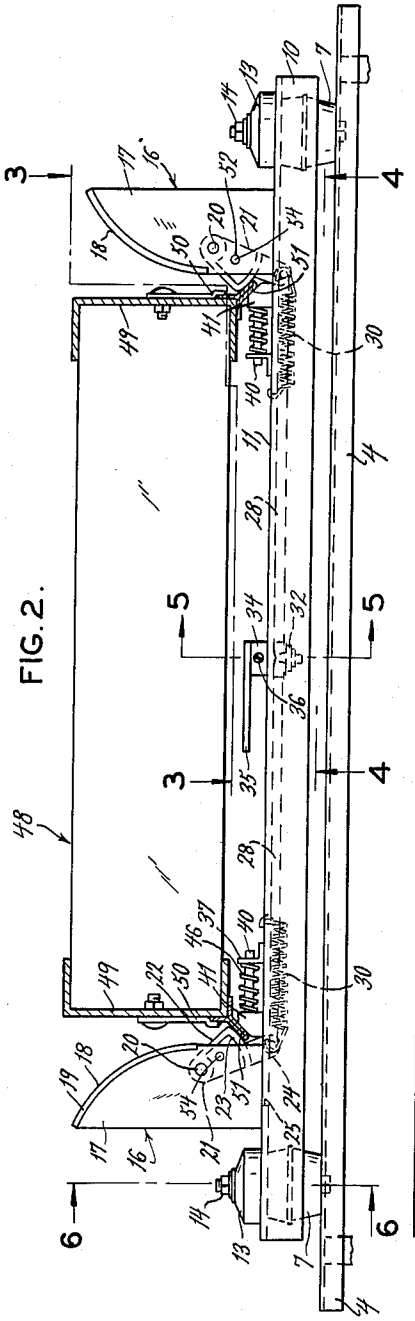


FIG. 2.

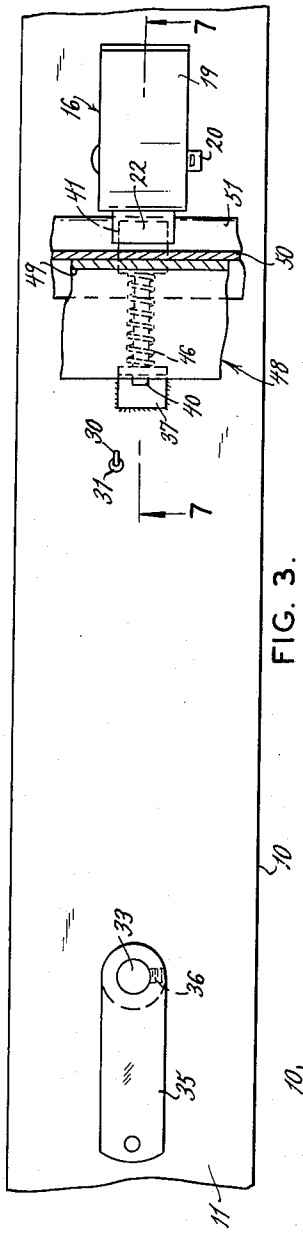


FIG. 3.

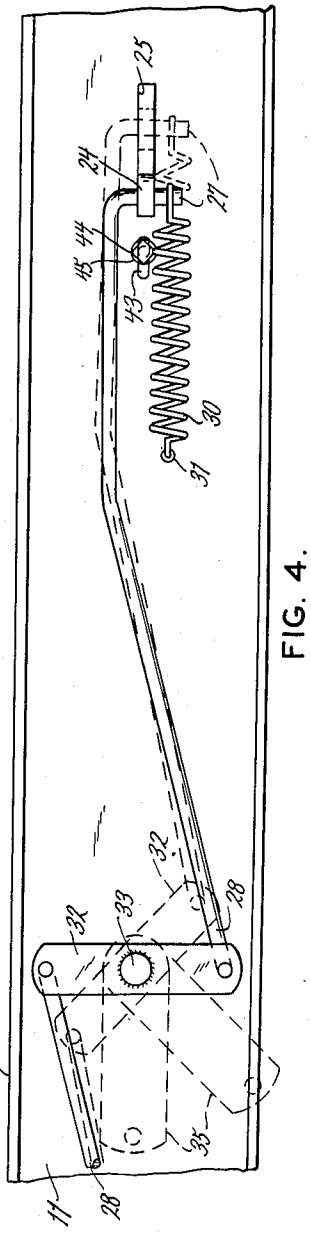


FIG. 4.

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VEHICLE MOUNTED TRANSPORT CLAMPS

Filed June 19, 1952 3 Sheets-Sheet 3

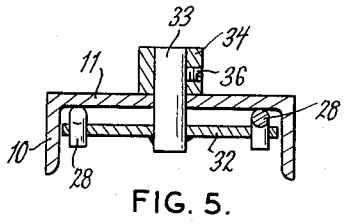


FIG. 5.

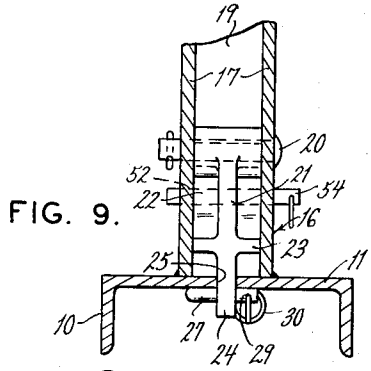


FIG. 9.

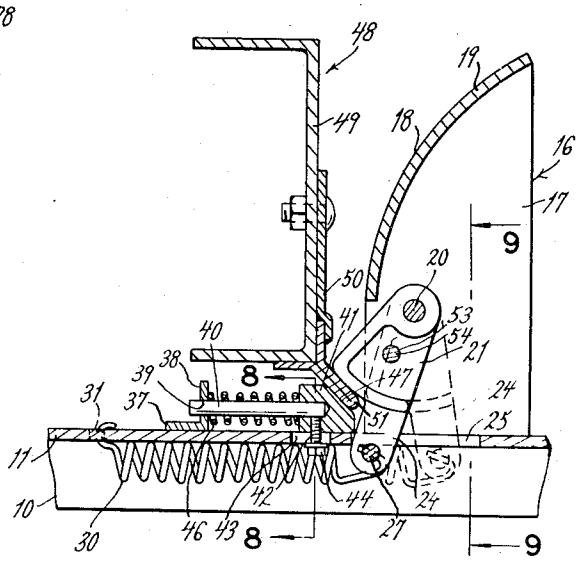


FIG. 7.

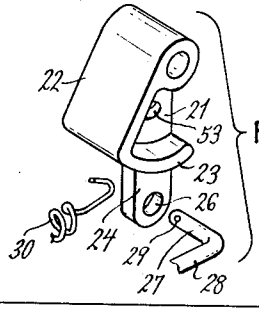


FIG. 10.

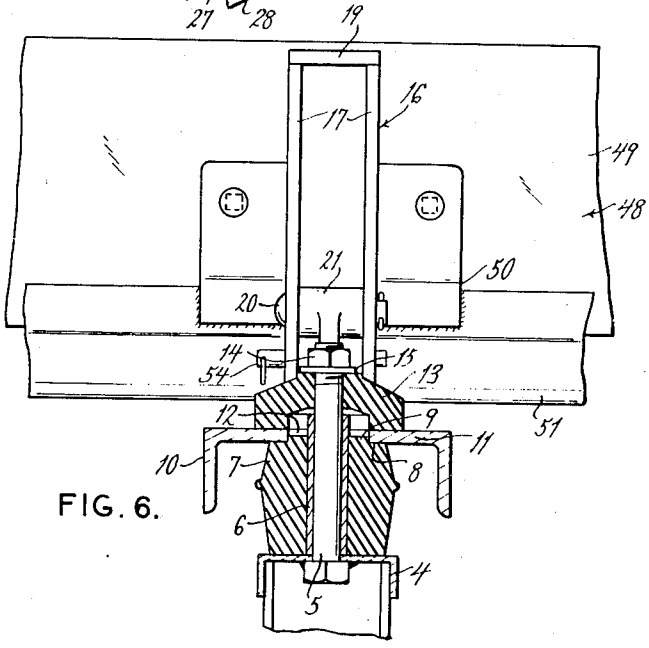


FIG. 6.

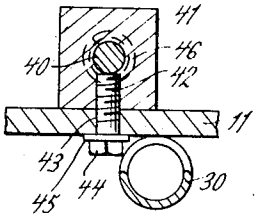


FIG. 8.

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VEHICLE MOUNTED TRANSPORT CLAMPS

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Application June 19, 1952, Serial No. 294,504

8 Claims. (Cl. 248—361)

This invention relates in general to aerial ladders and, more particularly, to a vehicle mounted transport clamp, that is to say, a clamping device for holding an aerial ladder firmly in a horizontal or "carrying" position during travel of the vehicle on which the aerial ladder is mounted.

Many industrial vehicles are equipped with aerial ladders and are utilized for servicing telephone lines, electric power lines, cleaning and repairing street lamps, and similar purposes. The ladders usually employed in such vehicles are pivotally mounted upon some type of upstanding rotary pedestal so that the ladder can be elevated to various angular positions and swung about a vertical axis to reach various localities over the sides and end of the vehicle or truck. Ordinarily, when the truck is being driven from place to place, the aerial ladder is pulled down into approximately horizontal position and lashed or clamped in such position. Because it is inherently necessary that an aerial ladder be tiltably and swingably mounted on the pedestal, which forms its main support, the means by which it is lashed or clamped in inoperative or "carrying" position will be subjected to very substantial forces resulting from side swaying and up-and-down bumping movements imparted to the ladder by the movement of the vehicle. In order to withstand these forces, it has been the practice to employ rather cumbersome devices for lashing and clamping aerial ladders in "carrying" position and such devices have proved to be not only expensive and clumsy, but also inefficient and time-consuming.

It is, therefore, the primary object of the present invention to provide a transport clamp for aerial ladders which is rugged and durable in construction and which may be simply and quickly actuated to release the ladder.

It is also an object of the present invention to provide a transport clamp of the type stated which will automatically re-engage an aerial ladder and hold it firmly and securely in "carrying" position.

It is a further object of the present invention to provide a transport clamp of the type stated which will effectively cushion and absorb the vibration, shock, and other forces normally imposed upon an aerial ladder while in "carrying" position during movement of the vehicle upon which the ladder is mounted.

With the above and other objects in view, my invention resides in the novel features of form, construction, arrangement, and combination of parts presently described and pointed out in the claims.

In the accompanying drawings (three sheets)—

Figure 1 is a fragmentary side elevational view of a vehicle equipped with an aerial ladder and having a transport clamp constructed in accordance with and embodying the present invention;

Figure 2 is a transverse sectional view taken along line 2—2 of Figure 1;

Figures 3, 4, 5, and 6 are fragmentary sectional views taken along lines 3—3, 4—4, 5—5, and 6—6, respectively, of Figure 2;

Figure 7 is a fragmentary sectional view taken along line 7—7 of Figure 3;

Figures 8 and 9 are fragmentary sectional views taken along lines 8—8 and 9—9, respectively, of Figure 7; and

Figure 10 is an exploded perspective view of the detent-cam forming a part of the present invention.

Referring now in more detail and by reference characters to the drawings, which illustrate a preferred embodiment of the present invention, A designates a conventional truck or vehicle provided with an open-topped body 1 and a cab 2 having a steel top wall or roof 3. Bolted or otherwise suitably mounted across the top of the cab roof 3 is a downwardly turned U-shaped channel 4 provided adjacent its opposite ends with upwardly extending bolts 5 having external sleeves 6 and barrel-shaped rubber shock absorbers 7, which are, in turn, provided with upwardly presented annular shoulders 8 and diametrally reduced circular bosses 9. Mounted upon, and extending horizontally between, the shock absorbers 7 is a downwardly flanged channel 10 having a horizontal web 11, which is, in turn, provided with apertures 12 for snug-fitting disposition around the bosses 9. The bolts 5 project upwardly for a substantial distance above the channel-web 11 and through a relatively large downwardly flanged rubber retaining cap 13, which is, in turn, held in place by a nut 14 and washer 15. Thus it will be seen that the channel 10 is held in a shock-absorbing or rubber-cushioned mount and extends transversely across the top of the vehicle cab in upwardly spaced, substantially parallel relation to the channel 4.

Welded to the upper face of the channel-web 11 in inwardly spaced relation to the apertures 12 are upwardly extending vertical guides 16 each comprising a pair of spaced identically shaped vertical plates 17 having upwardly and outwardly curved upper margins 18 transversely connected by integrally formed arcuate webs 19. Mounted at its end in, and extending horizontally between, each pair of plates 17 is a pivot pin 20 for rockably supporting a detent-cam 21 having an angularly inwardly presented flange 22 merging at its lower margin into an integrally formed arcuate locking shoe 23, the under surface of which conforms to a circular arc having a center coincident with the center line of the pin 20. The cam 21 is further provided with a downwardly extending radial leg 24 which projects through an elongated slot 25 formed in the channel-web 11, and adjacent its lower extremity is provided with an aperture 26 for rotatably receiving a pin-like element 27 formed integrally on the end of an actuating rod 28. The pin-like element 27 extends through the aperture 26 and is itself provided with an aperture 29 for receiving the hook end of a tension spring 30, which is engaged at its other end in an aperture 31 formed in the channel-web 11 and is so arranged as to normally bias the cam member 21 toward the inner end of the slot 25, that is to say, to the position shown in full lines in Figure 7.

As will be seen by reference to Figure 4, there are two such rods 28 extending inwardly from the opposite sides of the channel 10 toward the center and these rods 28 are deflected on opposite sides of the longitudinal center line of the channel 10 for rocking engagement, respectively, in the opposite ends of an actuating bar 32, which is welded centrally to the lower end of a short shaft 33 rockably mounted in, and extending vertically through, the channel-web 11 and provided on its upper end with a collar 34 having an integrally formed radial handle 35. The collar 34 is preferably locked to the shaft 33 by means of a set screw 36, all as best seen in Figure 5.

Welded or otherwise rigidly secured upon the upper face of the channel-web 11 in inwardly spaced relation to

the guides 16 are small L-shaped brackets 37 each having a vertical leg 38 which is provided with an aperture 39 for shiftably receiving a slide-pin 40 which extends outwardly toward the cam member 21 with which it is associated and, on its outer end, is provided with a stop-block 41 rigidly affixed thereto by means of a set screw 42 which projects downwardly through a slot 43 formed in the channel-web 11. At its lower end, the set screw 42 is provided with an enlarged head 44 and a washer 45 which bears slidingly against the under face of the channel-web 11. Coiled concentrically around the slide-pin 40 and abutting at its opposite ends against the opposed faces of the bracket leg 38 and stop-block 41 is a compression spring 46, which urges the stop-block 41 outwardly toward the outer end of the slot 43 in the direction of the detent-cam 21. The upper corner of the stop-block 41 is cut off along an angle of forty-five degrees to provide an upwardly and outwardly presented contact face 47.

Conventionally mounted within the truck body 1 is an aerial ladder B including a main or bottom section 48 having spaced parallel side channels 49. Bolted or otherwise securely fastened to each of the side channels 49 in position for operative engagement with the detent-cams 21 are clamp rails 50 having downwardly and outwardly projecting striker flanges 51 disposed at an angle of substantially forty-five degrees to the web of the ladder channels 49, so that when the ladder B is in horizontal or "carrying" position, the striker flange 51 will lie in snug-fitting clamped disposition against the face 47 of the stop-block 41 and be held tightly in such position by the detent-cam 21.

The ladder B may be readily released by rocking the handle 35, thereby pushing the rods 28 outwardly and rocking the detent-cams 21 outwardly to the position shown in dotted lines in Figure 7. As soon as the locking shoe 23 has become disengaged from the striker flange 51, the stop-block 41 will shift outwardly under influence of the spring 46 and its inclined face 47 will cam against the inclined under face of the striker flange 51, kicking the ladder B upwardly and out of horizontal or "carrying" position. As soon as the handle 35 is released, the springs 30 will return the detent-cams 21 to initial position. When the ladder B is being pulled down into horizontal or "carrying" position preparatory to transportation, the lower margin of the striker flange 51 will initially strike against the inclined flange 22 of the detent-cam 21, swinging it outwardly toward the position shown in dotted lines in Figure 7 and will next engage the inclined face 47 of the stop-block 41 and shift the latter inwardly to permit the detent-cams 21 to snap inwardly into locked position, as shown in full lines in Figure 7.

Because the striker flanges 51 on the opposite sides of the ladder B diverge downwardly and outwardly with respect to each other, all the divers forces to which the ladder is subjected as the vehicle moves along will be resolved along lines perpendicular to the striker flanges 51. Thus most of these forces will tend partially to cancel each other out and the ladder B will be firmly and securely held in well-centered position between the guides 16. The transport clamp of the present invention is relatively free of rattling and other types of undesirable movement and will hold an aerial ladder firmly and securely while, at the same time, being capable of relatively free and easy locking and unlocking action.

If desired, one pair of guides 17 may be provided with aligned apertures 52 and the body of the detent-cam 21 may similarly be provided with an aperture 53 positioned for registration with the apertures 52 when the detent-cam 21 is in the position shown in full lines in Figure 7. A locking pin 54 is removably inserted through the apertures 52, 53, when the ladder B is in "carrying" position to prevent unauthorized or accidental unlatching of the detent-cams 21.

It should be understood that changes and modifications in the form, construction, arrangement, and combination of the several parts of the vehicle mounted transport clamp may be made and substituted for those herein shown and described without departing from the nature and principle of my invention.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. A transport clamp for use with an aerial ladder, comprising outwardly and downwardly divergent inclined flanges on opposite sides of the ladder, a substantially horizontal support member extending transversely beneath the ladder, lower abutment members operatively mounted on the support member for respective engagement against the under faces of the flanges, means for resiliently urging said lower abutment means into such engaged position, auxiliary means associated with the support member, upper abutment members operatively supported by said auxiliary means in upwardly spaced relation to the lower abutment members for respective engagement with the upper faces of the flanges, means for resiliently urging the upper abutment members into such engaged position whereby to hold the ladder in transport position and means for moving the upper abutment members out of said engaged position for releasing the ladder.

2. A transport clamp for use with an aerial ladder, comprising outwardly and downwardly divergent inclined flanges on opposite sides of the ladder, a substantially horizontal support member extending transversely beneath the ladder, lower abutment members operatively mounted on the support member for respective engagement against the under faces of the flanges, means for resiliently urging said lower abutment means into such engaged position, auxiliary means associated with the support member, upper abutment members operatively supported by said auxiliary means in upwardly spaced relation to the lower abutment members for respective engagement with the upper faces of the flanges, means for resiliently urging the upper abutment members into such engaged position whereby to hold the ladder in transport position and actuating means for moving the upper abutment members into and out of said engaged position.

3. A transport clamp for use with an aerial ladder, comprising outwardly and downwardly divergent inclined flanges on opposite sides of the ladder, a substantially horizontal support member extending transversely beneath the ladder, lower abutment members operatively mounted on the support member for respective engagement against the under faces of the flanges, means for resiliently urging said lower abutment means into such engaged position, auxiliary means associated with the support member, upper abutment members operatively supported by said auxiliary means in upwardly spaced relation to the lower abutment members for respective engagement with the upper faces of the flanges, means for resiliently urging the upper abutment members into such engaged position whereby to hold the ladder in transport position, actuating means for moving the upper abutment members into and out of said engaged position, and means associated with the actuating means for optionally locking said actuating means when the upper abutment members are in engaged position.

4. A clamping device for holding an aerial ladder in transport position upon a vehicle, said clamping device comprising in combination, a clamp-rail rigidly fastened to each side of the ladder, each of said clamp-rails having an inclined striker-flange which projects laterally outwardly and downwardly from the ladder when said ladder is in transport position, a substantially horizontal support member extending transversely beneath the ladder when the ladder is in transport position, stop-blocks slidably mounted on the support member for abutment respectively against the under faces of the striker-flanges, spring

means associated with each stop-block for resiliently urging such stop-block into abutment against the striker-flange with which it is associated, auxiliary means associated with the support member, detent members swingably supported by said auxiliary means and being respectively located on opposite sides of the ladder, so that when said ladder is in transport position it will lie between the detent members, spring means for biasing the detent members inwardly toward each other and into engagement with the upwardly presented faces of the striker-flanges so as to retain the ladder in transport position, and means for swinging the detent members outwardly with respect to each other for releasing the ladder.

5. A clamping device for holding an aerial ladder in transport position upon a vehicle, said clamping device comprising in combination, a clamp-rail rigidly fastened to each side of the ladder, each of said clamp-rails having an inclined striker-flange which projects laterally outwardly and downwardly from the ladder when said ladder is in transport position, a substantially horizontal support member extending transversely beneath the ladder when the ladder is in transport position, stop-blocks slidably mounted on the support member and having upwardly and outwardly presented inclined faces for abutment respectively against the under faces of the striker-flanges, spring means associated with each stop-block for resiliently urging such stop-block into abutment against the striker-flange with which it is associated, auxiliary means associated with the support member, detent members swingably supported by said auxiliary means and being respectively located on opposite sides of the ladder, so that when said ladder is in transport position it will lie between the detent members, spring means for biasing the detent members inwardly toward each other and into engagement with the upwardly presented faces of the striker-flanges so as to retain the ladder in transport position, and means for swinging the detent members outwardly with respect to each other for releasing the ladder.

6. A clamping device for holding an aerial ladder in transport position upon a vehicle, said clamping device comprising in combination, a clamp-rail rigidly fastened to each side of the ladder, each of said clamp-rails having an inclined striker-flange which projects laterally outwardly and downwardly from the ladder when said ladder is in transport position, a substantially horizontal support member extending transversely beneath the ladder when the ladder is in transport position, stop-blocks slidably mounted on the support member for abutment respectively against the under faces of the striker-flanges, spring means associated with each stop-block for resiliently urging such stop-block into abutment against the striker-flange with which it is associated, auxiliary means associated with the support member, detent members swingably supported by said auxiliary means and being respectively located on opposite sides of the ladder, so that when said ladder is in transport position it will lie between the detent members, spring means for biasing the detent members inwardly toward each other and into engagement with the upwardly presented faces of the striker-flanges so as to retain the ladder in transport position, and manually operable means for swinging the detent members outwardly with respect to each other for releasing the ladder.

7. A clamping device for holding an aerial ladder in transport position upon a vehicle, said clamping device comprising in combination, a clamp-rail rigidly fastened to each side of the ladder, each of said clamp-rails having an inclined striker-flange which projects laterally outwardly and downwardly from the ladder when said ladder is in transport position, a substantially horizontal support member extending transversely beneath the ladder when the ladder is in transport position, stop-blocks slidably mounted on the support member for abutment respectively against the under faces of the striker-flanges, spring means associated with each stop-block for resiliently urging such stop-block into abutment against the striker-flange with which it is associated, pivot-forming means associated with, and located inwardly from each end of, the support member, detent members swingably mounted on each of said pivot-forming means and being respectively located on opposite sides of the ladder, so that when said ladder is in transport position it will lie between the detent members, said detent members being provided with downwardly and inwardly presented arcuate faces for engagement with the upwardly presented faces of the striker-flanges, spring means for biasing the detent members inwardly toward each other and into said engaged position with the striker-flanges so as to retain the ladder in transport position, and means for swinging the detent members outwardly with respect to each other for releasing the ladder.

8. A clamping device for holding an aerial ladder in transport position upon a vehicle, said clamping device comprising in combination, a clamp-rail rigidly fastened to each side of the ladder, each of said clamp-rails having an inclined striker-flange which projects laterally outwardly and downwardly from the ladder when said ladder is in transport position, a substantially horizontal support member extending transversely beneath the ladder when the ladder is in transport position, stop-blocks slidably mounted on the support member for abutment respectively against the under faces of the striker-flanges, spring means associated with each stop-block for resiliently urging such stop-block into abutment against the striker-flange with which it is associated, upstanding guide members mounted on the support member and being respectively located on opposite sides of the ladder so that when said ladder is in transport position it will lie between the guide members, said guide members furthermore being provided with upwardly and inwardly presented arcuate guide-faces for engagement with the outwardly presented edges of striker-flanges when the ladder is swung down into transport position and is accidentally uncentered with respect to the guide members whereby the ladder will be shifted laterally in either direction as may be necessary to place it in proper substantially centered position between the guide members as it moves downwardly into said transport position, detent members swingably mounted on the guide members and being adapted to swing inwardly into engagement with the upper faces of the striker-flanges when said ladder is in transport position, spring means for biasing the detent members inwardly toward each other and into engagement with the upwardly presented faces of the striker-flanges so as to retain the ladder in transport position, and means for swinging the detent members outwardly with respect to each other for releasing the ladder.

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