

April 8, 1941.

H. J. TROCHE

2,237,853

LADDER CLAMP

Filed Nov. 3, 1938

2 Sheets-Sheet 1

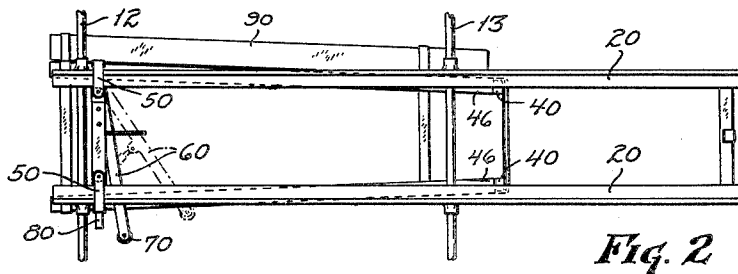


Fig. 2

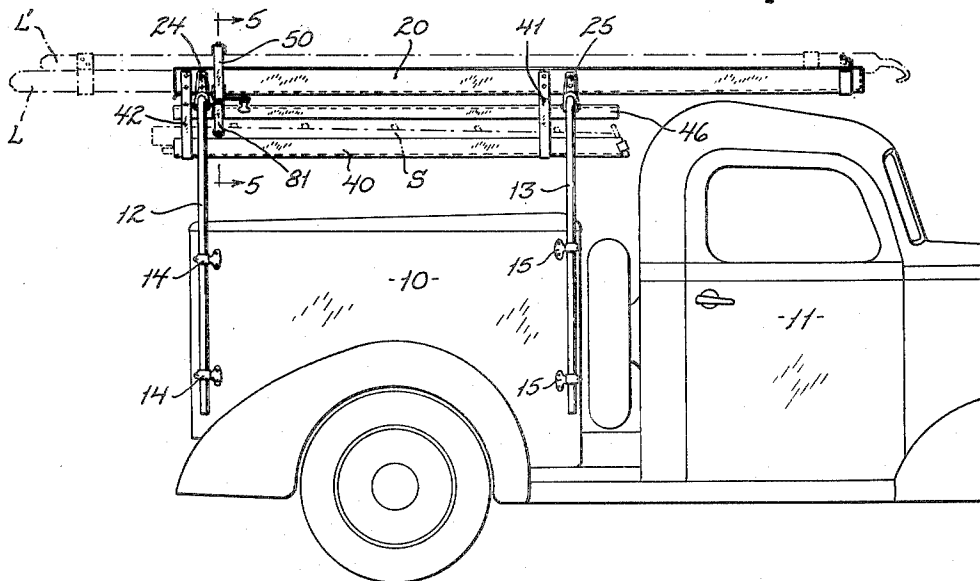


Fig. 1

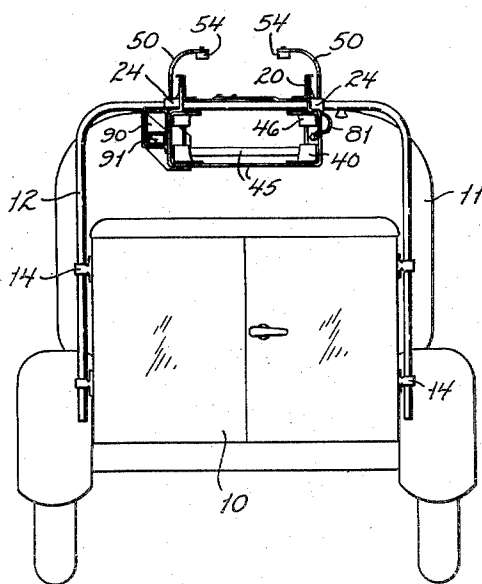


Fig. 3

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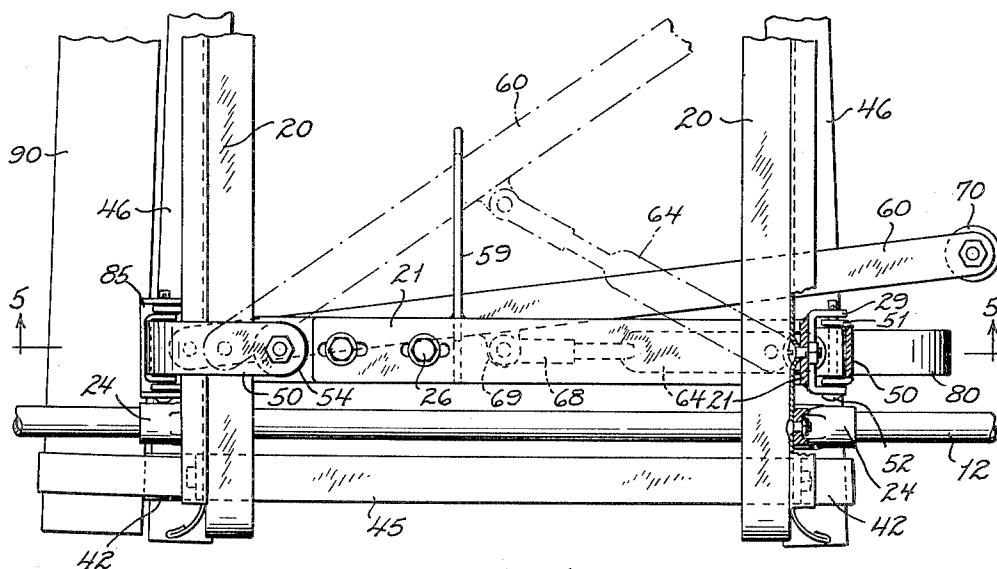


Fig. 4

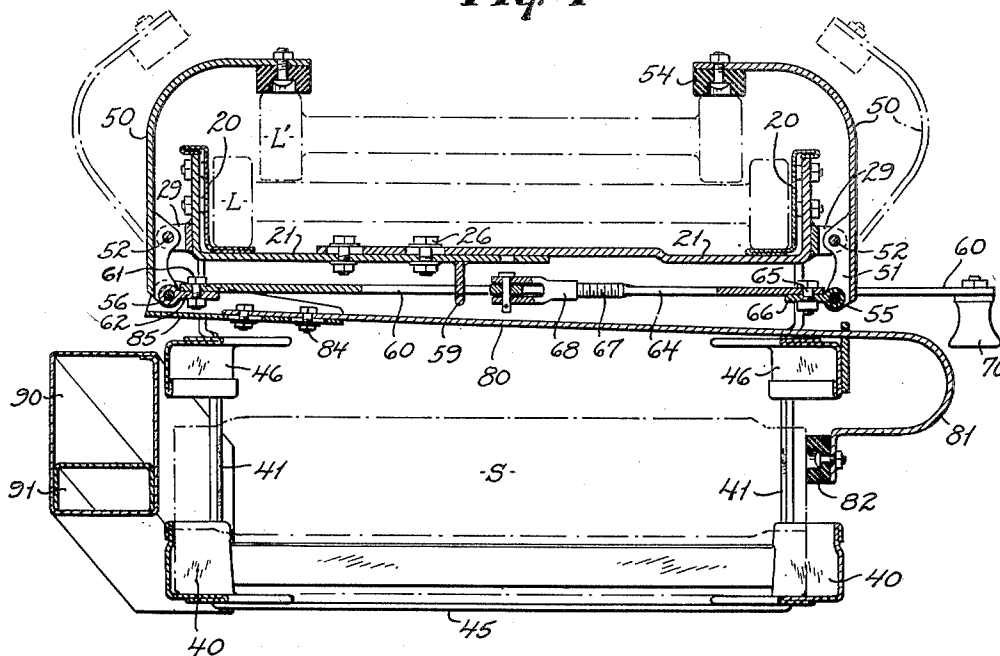


Fig. 5

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UNITED STATES PATENT OFFICE

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LADDER CLAMP

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4 Claims. (Cl. 224-29)

This invention relates to ladder brackets and clamps which are adapted for use in public utility vehicles for holding ladders of all sorts, including step ladders and extension ladders, securely in place and for preventing movement of them while the vehicle is in motion.

A further object of the invention is to make a quick action clamping device which, by a single motion, will lock a plurality of ladders in position and by reverse motion will release them for immediate use. The device has particular application in trucks which are used for telephone work or for any activity that requires ladders as part of the service equipment.

A desirable location for mounting ladders in equipment of this nature is on the top of the vehicle, where it does not obstruct a workman in obtaining access to the tool compartment of the vehicle or interfere with the vision of the driver. The difficulty in loading ladders at the top of the vehicle is the fact that they are apt to move as a result of the vibration of the vehicle, and as a result of sudden starting or stopping of the same. The present invention, however, overcomes all of these difficulties in a simple and expeditious manner.

Referring now to the drawings, Fig. 1 is a side view of a vehicle having ladders mounted thereon and having my clamping device attached thereto; Fig. 2 is a plan of ladder supporting mechanism shown in Fig. 1; Fig. 3 is an end view of the vehicle; Fig. 4 is a fragmentary plan on a larger scale that is used for Fig. 2 and shows the vehicle in greater detail with a portion in section; Fig. 5 is a transverse section taken on the line 5-5 in Fig. 4.

The vehicle with which the present invention is illustrated is shown as having a body 10 with a driver's cab 11. Ladders are adapted to be carried above the body and cab in supporting mechanism mounted on the body. For this purpose I have illustrated lengths of pipe or rods 12 and 13 of inverted U-shape, mounted in brackets 14 and 15, which are attached to the sides of the body.

The extension ladder support may comprise a pair of supporting guides 20, which rest upon the intermediate portions of the rods 12 and 13. These frame members may be adjustably positioned upon their supports by clamps 24 and 25, each of which has a portion which is affixed to one of the frame members and another portion that extends around the rod and is rigidly clamped thereto. The guides are preferably Z-shaped in cross-section and are smooth on their

faces, enabling a ready placement of the ladder by a sliding action.

The frame members 20 have sufficient length to receive and hold an extension ladder, indicated at L, L' in Figs. 1 and 5, the outer section L of which fits snugly within the frame members 20, while the inner section L' rests on the outer section.

The bars 20, which are adjustably supported by the brackets 24 and 25, are transversely connected in an adjustable manner, so that they may receive the ladder L with the desired snugness. This adjustable connection, illustrated in Fig. 5, comprises overlapping extensions of L-shaped bars 21 bolted to their respective frame members 20 and secured together by bolts 26, which pass through slots in one of the bars.

This invention is adapted for clamping ladders other than extension ladders, so I have illustrated a step-ladder "S," beneath the extension ladder and adapted to be positioned and clamped within a frame that is suspended from the extension-ladder frame.

In the preferred arrangement, the frame which carries the step-ladder, comprises longitudinally extending supporting guides 40 in the form of angle bars that are suspended from the members 20 by brackets 41 and 42, respectively. The frame members 40 are transversely braced by cross-members 45, which may be continuations of the brackets 41 and 42, as illustrated. The step-ladder supporting frame is wider at the rear than at the front, as illustrated in Fig. 2, to conform to the usual shape of such ladders.

Upper angle bars 46 paralleling the members 40 are provided to guide the forward end of the step-ladder, as the ladder is slanted up and slid forwardly and to prevent interference with or injury to the guides and mechanism above. The members 46 also serve to increase the rigidity of the frame.

It will be seen that the construction above described provides for conveniently supporting the step-ladder above the body and at the rear of the cab, and the extension ladder above the step-ladder, and overhanging the top of the cab, as illustrated in Fig. 1.

A feature of my invention is the clamping mechanism which effectively locks the ladders in these portions. I will first describe the mechanism for clamping the extension ladder, which is best illustrated in Figs. 4 and 5.

Pivotaly mounted on the vertical legs of the bars 21 are upright clamping levers 50, each of which is shown as having inward flanges 51 which

overlap U-shaped brackets 29 on the frame bars, the flanges being pivoted to the brackets by pins or rods 52. The bars 50 are shown as curving inwardly to extend across the top of the ladder extension L' and adjacent their free ends carry 5 on their undersides rubber blocks 54 adapted to bear against the top edges of the side rails of the ladder L'. Each clamping bar 50 is connected at 55 and 56, below the pivot 52, with a spreading device adapted to force the lower ends 10 of these clamping levers outwardly and thus bring the blocks 54 down tightly on the ladder rails.

The spreading device for the clamping arms 50 comprises a transverse bar 60, pivoted at 61 to a 15 clip 62 pivoted at 56 to the clamping bar. On the other side, a link 64 is pivoted at 65 to a clip 66, which is pivoted at 55 to the clamping bar. The link 64 has a threaded extension 67, on which is mounted an adjustable internal threaded clevis 20 68 pivoted to an ear 69 on the lever 60. The portion of the lever 60 between its pivot and the clevis 68 forms one member of a toggle, the other member being a link 64 and the clevis 68. The various pivots and clips just mentioned form, in effect, universal joints at each end of the 25 toggle. When this toggle is straightened by action of the lever 60, the ladders are clamped. The lever 60 slides in and is supported by a bracket 59 extending from the bars 21 and may be provided with a suitable handle 70 to enable 30 its ready movement by the operator.

To clamp the step-ladder, I provide a bar 80 slidably mounted transversely of the step-ladder frame above that frame, this bar having a downwardly curved portion 81 carrying at its end a 35 rubber block 82 adapted to abut the side face of the step-ladder rail. The bar 80 is adjustably clamped by bolts 84 passing through slots to an extension member 85, which is pivoted to the pivot 56 of the adjustable clamping bar 50, to which the lever 60 is pivotally attached. The result is that when the lever 60 is operated to 40 straighten the toggle, thereby clamping the extension ladder, the same movement, by swinging the pivot 56 outwardly, throws the block 82 against the side of the step-ladder.

The clamping members for both the extension ladder and the step-ladder are adjusted so that they act simultaneously, and hence a single movement of the lever 60 by its handle 70 clamps all 45 of the ladders in place.

The suspended support for the step-ladder may also, if desired, carry compartments for carrying 50 suitable tools. This is illustrated in Figs. 3 and 5, 55

where the suspending brackets 41 and 42 on one side, carry a sheet metal open-ended box having compartments 90 and 91, for tree trimmers and ground rods, respectively, or other purposes if desired.

I claim:

1. The combination of a ladder support, a pair of clamping levers intermediately pivoted to the support and having upper portions adapted to act downwardly on a ladder resting on the support, 5 an operating lever connected to the lower portion of one of said clamping levers, and a toggle link connecting the lower portion of the other clamping lever to said operating lever.

2. The combination of a plurality of superimposed spaced ladder supports, a pair of clamping levers intermediately pivoted to the upper support and having the upper portion thereof adapted to bear against a ladder resting on the upper support, a third clamping member disposed between the supports and having one end portion thereof adapted to bear against a ladder on the lower support, an operating lever disposed between the supports and connected to one of the 25 clamping levers for the upper ladder and also connected to the clamping member for the lower ladder, and means connecting the operating lever to the other clamping lever for the upper ladder whereby movement of the operating lever in one direction actuates all of the clamping members and levers to hold the ladders on their respective supports.

3. The combination of a ladder support, a pair of clamping levers intermediately pivoted to the support and having the upper portion of each clamping lever adapted to bear against a ladder resting on the support, a swingable operating lever pivotally connected to the lower portion of one of said clamping levers, and a link pivotally 40 connected to the operating lever at an intermediate portion thereon and also pivotally connected to the other clamping lever.

4. The combination of a ladder supporting structure, a pair of clamping levers intermediately pivoted to said structure and each having one end thereof adapted to bear against a ladder resting on the support, there being one lever on each side of the ladder, a swingable operating lever having at least a portion thereof positioned 45 at one side of the ladder, a link pivotally connected to the lever and to the lower end portion of one of the clamping levers, and means including a second link for operating the other clamping lever whenever the first is actuated.

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