Oct. 18, 1949. A. R. ROSS 2,485,413

LADDER

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Fig. 1

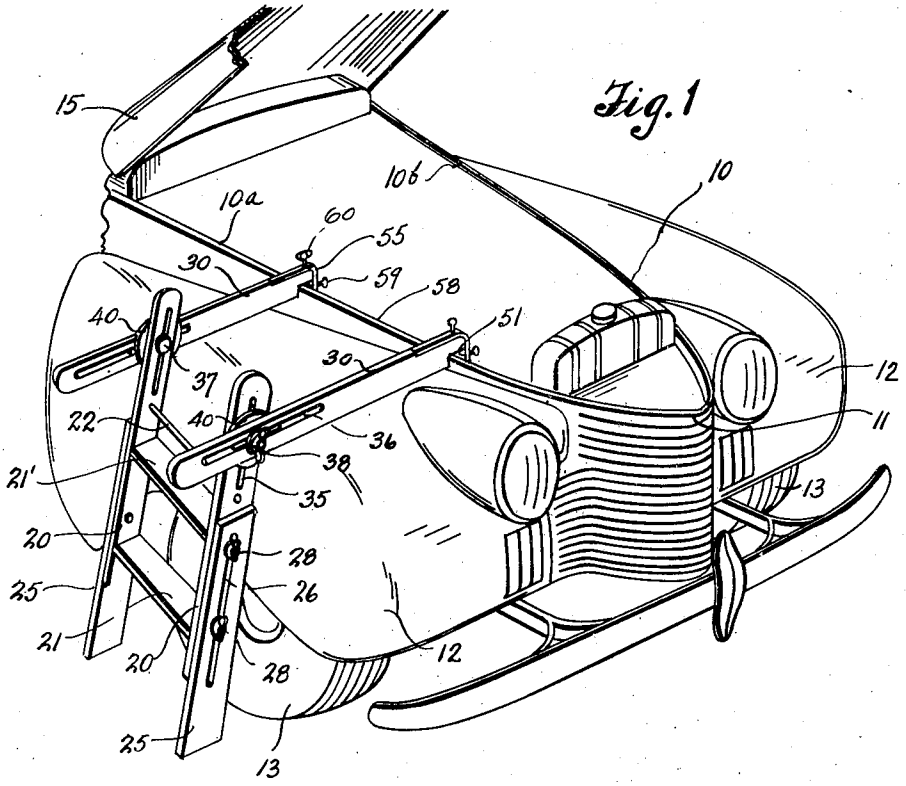


Fig. 2

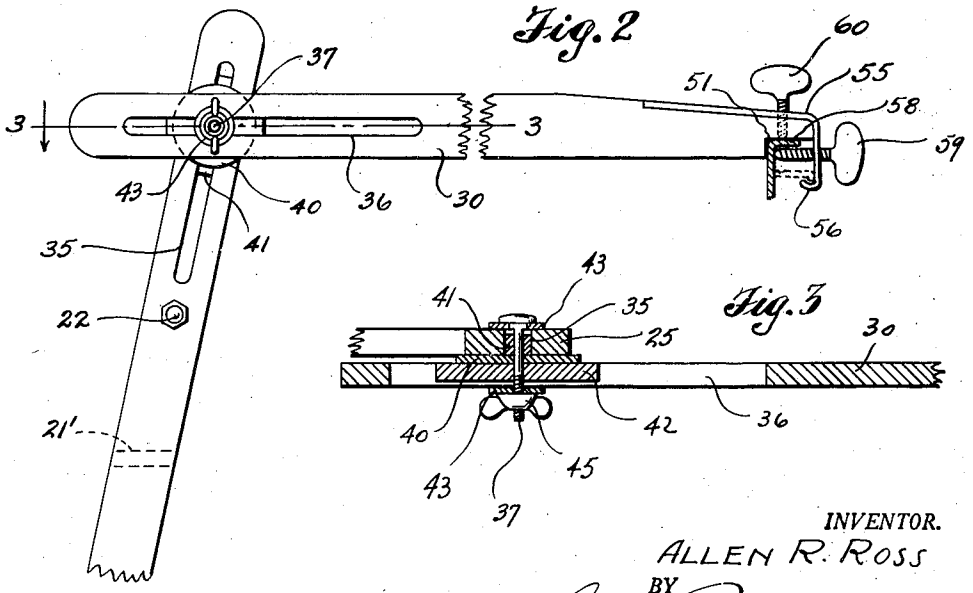


Fig. 3

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Fig. 4

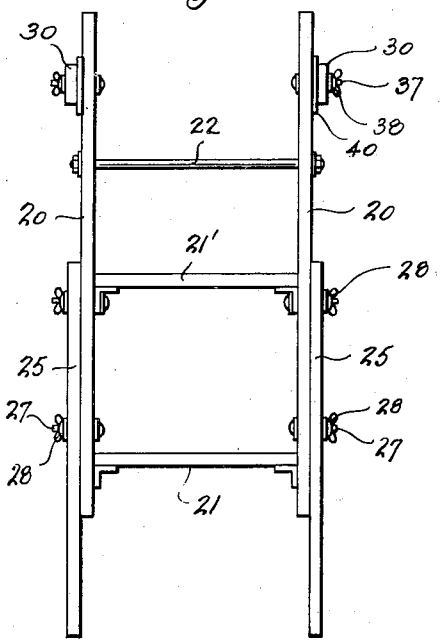
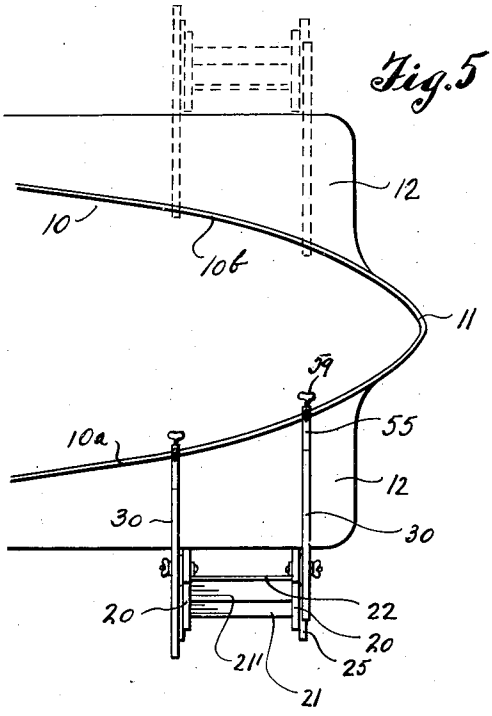


Fig. 5



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LADDER

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3 Claims. (Cl. 228—60)

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This invention relates to specialty ladders, and it has reference more particularly to ladders of a character designed for use by automobile mechanics or repair workers for gaining easier access to parts of the engine or other parts of the automobile equipment that is contained beneath the hood cover and is ordinarily reached by lifting of the said cover.

In order to impart a better understanding of the invention and the reasons for the present ladder design, it will here be explained that of recent years the automobile industry has noted many changes particularly in hood design. In most instances, hood portions of automobiles have been made higher and wider, fenders have been increased in width, and the previous method of gaining access to the engine and closely associated parts by raising a side and top section of the hood has given way to a design featuring an upwardly hinging hood cover. This change necessitates that a workman in gaining access to the engine, must reach across the wide fender and over the top edge of the side walls of the hood. When the engine is set deep in the chassis, it is quite difficult to reach by a person standing on the floor level, and it has become a custom to provide boxes, or blocks for the workman to stand on. Such means of support are unstable and dangerous, besides not always being of a most practical height. Also, present day design of automobile bodies features a hood portion that, just forward of the instrument panel or dash board, has a width that is equal to the full width of the main body, then tapers to a relatively narrow width across the front end. However, the fenders for the front wheels are retained at full width of the body and this results in causing considerable difficulty on the part of the workman, in reaching the engine for repair or adjustment from either side of the vehicle.

In view of the foregoing, it has been the principal object of this invention to provide a ladder of special and novel design, that may be applied for use to the automobile at either side of the hood, for the support of the workman at a convenient elevation that will enable him to easily reach the engine, or other parts of equipment located beneath the hood cover.

Furthermore, it is an object of the present invention to provide a ladder that has special and adjustable arms fixed thereto at its upper end, designed to extend horizontally across a fender for application to the top edge of the side wall of the hood when the hood cover is in a raised position, whereby to support the ladder clear of

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the fender and in a secure manner and in a position convenient for the workman to gain access to the work at hand.

It is another object of the invention to provide a ladder that has the aforementioned supporting arms adjustably applied thereto in order that the ladder may be quickly and easily adapted for use at either side of the automobile.

Still another object of the invention is to provide extension legs for ladders of this kind so as to make it possible to adjust the ladder to the most convenient working height, for the particular automobile being worked on, or to take care of change in height that might be due to the vehicle being supported on a jack or otherwise elevated above the floor level.

Still other objects of the invention reside in the various details of construction of parts of the ladder, both in its preferred form and in its various modifications, or alternative forms, and in their combination and use as will hereinafter be fully described.

In accomplishing these and other objects of the invention, I have provided the improved details of construction, the preferred forms of which are illustrated in the accompanying drawings, wherein—

Fig. 1 is a perspective view of a ladder embodied by the present invention, illustrating it as applied to an automobile for use.

Fig. 2 is an elevational detail of the upper end portion of the ladder, illustrating the attachment of one of the adjustable supporting arms and one mode of its application to the top edge of the hood wall.

Fig. 3 is a horizontal section taken on line 3—3 in Fig. 2, illustrating the means for adjustably connecting the arm to the ladder leg.

Fig. 4 is a front elevation of the ladder.

Fig. 5 is a top view, illustrating the independent adjustment of the supporting arms to compensate for hood taper and to adapt the ladder for use at the right or left side of an automobile.

Referring more in detail to the drawings—

In Fig. 1 I have illustrated the front end portion of a typical present-day automobile, and have shown a ladder, embodied by the present invention applied thereto. In this view, the hood portion of the automobile body is designated in its entirety by reference character 10, and it comprises opposite side walls 10*a* and 10*b* that, as they extend forward from the main portion of the vehicle body, curve toward each other, as is indicated by the showing in Fig. 5, of the drawings, and are joined in a rounded nose designated

at 11. At opposite sides of the hood structure, are the front wheel fenders 12, overlying the front wheels 13. The hood cover is designated by numeral 15 and, in Fig. 1, it is shown in its raised position, as required for working on or for repairing certain parts of the engine or other parts of the vehicle's equipment that is located beneath the hood cover.

In its present preferred form for most general use, the ladder of this invention comprises the spaced, upright, opposite leg portions 20 and 20 that are rigidly joined in spaced relationship by two horizontal steps 21 and 21', and near the upper end of the ladder, by a cross rod 22. These parts join the legs in spaced relationship, and if it is desired, the legs could be inclined toward each other for greater stability in use of the ladder.

While dimensions of the ladder parts are not critical, it has been found quite practical in making ladders for use with a majority of present day makes of automobiles, that the legs 20—20 be approximately four feet long and that the width of the ladder be from eighteen to twenty-four inches.

In order to take care of different requirements for different makes of vehicles, or for different individuals, or to best suit the nature of the work to be done, and also to adapt the ladder for better use when the vehicle being worked on is somewhat elevated from the floor level on which the ladder will stand, the ladder is provided with extension legs 25—25; each being formed along its upper portion with a longitudinal slot 26. Two bolts 27 are extended through the lower portion of each ladder leg in spaced relationship therealong, and pass freely through the slot of the corresponding extension leg to permit relative adjustment of the parts to change the effective length of the ladder, and wing nuts 28 are applied to the bolts and may be tightened to clamp the extension portions at set positions of adjustment.

By this means, the length of ladder may be extended as needed to best suit conditions of work. If such extensions are not desired, they may easily and readily be removed, and the ladder legs 20—20 applied directly upon the floor.

It is the intent that, in use of the present ladder, it shall be supported in its intended, slightly inclined upright position from the vehicle hood, but not in contact with the fenders or parts that might be marred or damaged thereby. Therefore, at its upper end, the ladder is equipped with two horizontally extended supporting arms 30—30. Each of these arms is equipped at its outer end with means for its easy securement to the top edge of the hood side wall, and at its outer end is adjustably affixed to the upper end portion of the corresponding leg 20 of the ladder. The preferred means of adjustable connection of arm and leg is shown in Figs. 2 and 3, wherein it is noted that the leg is formed centrally along its upper portion with a longitudinal slot 35. Likewise, the corresponding horizontal arm is formed along its outer portion with a longitudinal slot 36. The slotted portion of the arm is placed across the slotted portion of the corresponding leg, as clearly shown in Fig. 2, and a clamp bolt 37 is extended through the slots as the means for joining these parts together.

A feature of this particular connection of parts resides in the provision of a flat metal disk 40 that is disposed flatly between the adjacent surfaces of the ladder leg and its attached arm, as shown in Fig. 3. On one side of the disk 40, a rib 41 is diametrically secured and this rib is contained slidably in the slot 35 of the ladder leg for adjustment of the disk therealong. On the other side of the disk, a metal rib 42 is diametrically secured and this is slidably contained in the slot 36 of the corresponding arm. Washers 43—43 are applied to the bolt at the outside of the crossed arm and leg, and a wing nut 45 is applied to the bolt to draw the parts together and to securely clamp them at a set position of adjustment.

The two ribs 41 and 42 are fixed on opposite faces of the disk 40 at a designated angular relationship so that, when the arms are horizontal and are applied at their inner ends to the hood, the ladder will be given a definite slope, leaning slightly toward the vehicle. The provision of slots in the upper ends of the ladder legs makes possible the adjustment of arms to the necessary height for their attachment to the particular vehicle to be worked on. The slots in the arms make possible the independent adjustment of arms that is required to suit the tapering peripheral edge of the hood and to adapt the ladder for use at either side of the vehicle; it being understood that when the ladder is being used in the manner illustrated, one of the horizontal supporting arms must necessarily be extended farther than the other if the ladder is to be kept straight with the direction of the vehicle. Then when the ladder is applied to the opposite side of the vehicle, the relative adjustment in effective length of the lateral arms has to be reversed.

In order that the supporting arms may be securely affixed at their inner ends to the hood edge, and thus insure against ladder slippage under weight of the user, each is equipped at its inner end with special clamp means for various hood structures and a downwardly facing seat 51 in the lower edge of the inner end of the arm of a width sufficient to receive the top flange of the hood wall therein. Fixed to extend along the top edge of the arm is a metal strap 55 that extends also down along the inner end of the arm and terminates below the seat 51 in an outturned end hook 56. When this arm is applied to the hood side wall, the flange 58 that is secured along the top edge of the hood wall is received against the seat, as seen in Fig. 2, then a clamp bolt 59 that is threaded through the lower portion of the downturned end of the strap is adjusted to clamp against the hood wall below the flange and thus to securely affix the arm to the wall. Or, in some hood designs, a set screw 60 is threaded down from the top of the seat to engage the flange and clamp the arm in place. With the ladder so attached, it will be safely and securely held in place.

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

1. A ladder of the character described comprising spaced legs, horizontal steps joining the legs, horizontal arms extending inwardly from the upper ends of the legs and adjustable to extend to greater or lesser extent and equipped at their inner ends with means for holding contact with a support; said legs and said arms each having longitudinal slots therein and said slotted parts being in crossed relationship and clamp bolts applied through the slots of corresponding legs and arms for securing any adjustment of an arm upwardly or downwardly on the leg or any adjust-

ment of the arm in its horizontal extension from the ladder.

2. A ladder of the character described comprising spaced legs, horizontal steps joining the legs, horizontal arms extending inwardly from the upper ends of the legs and adjustable independently of each other to extend to greater or lesser extent and equipped at their inner ends with means for holding contact with a support; said legs and said arms each having longitudinal slots therein and said slotted portions being disposed in crossed relationship, rigid means between the slotted parts of arms and legs with ribs thereon slidably contained in the slotted parts of the arms and legs to retain the angular rigidity of the arms relative to the legs and bolts for clamping the parts in adjusted relationship.

3. A ladder as set out in claim 2 wherein the means between the slotted portions of arms and legs comprises a disk with ribs on opposite sides thereof to engage within the slots of the arms and legs and a clamp bolt extended through the slots and through the disk for clamping the parts together.

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