Nov. 24, 1959 J. B. WEIDNER 2,914,134

VEHICLE MOUNTED LADDER

Original Filed June 6, 1956 2 Sheets-Sheet 1

Fig. 2.

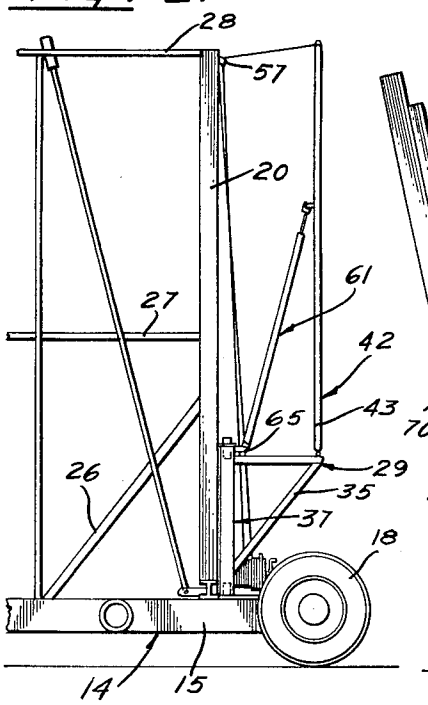



Fig. 1.

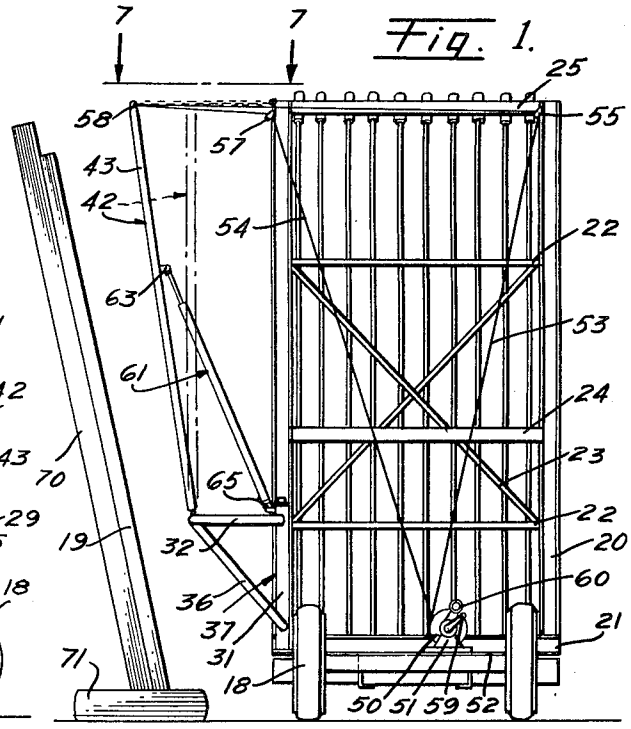



Fig. 4.

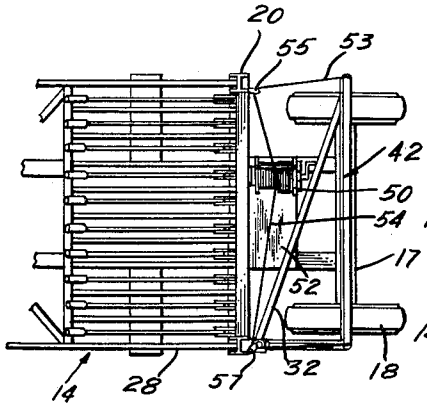
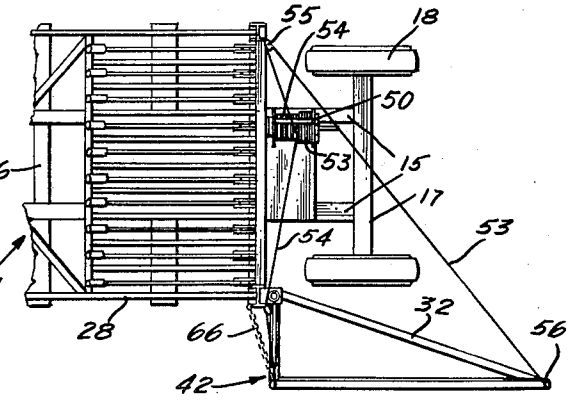



Fig. 3.



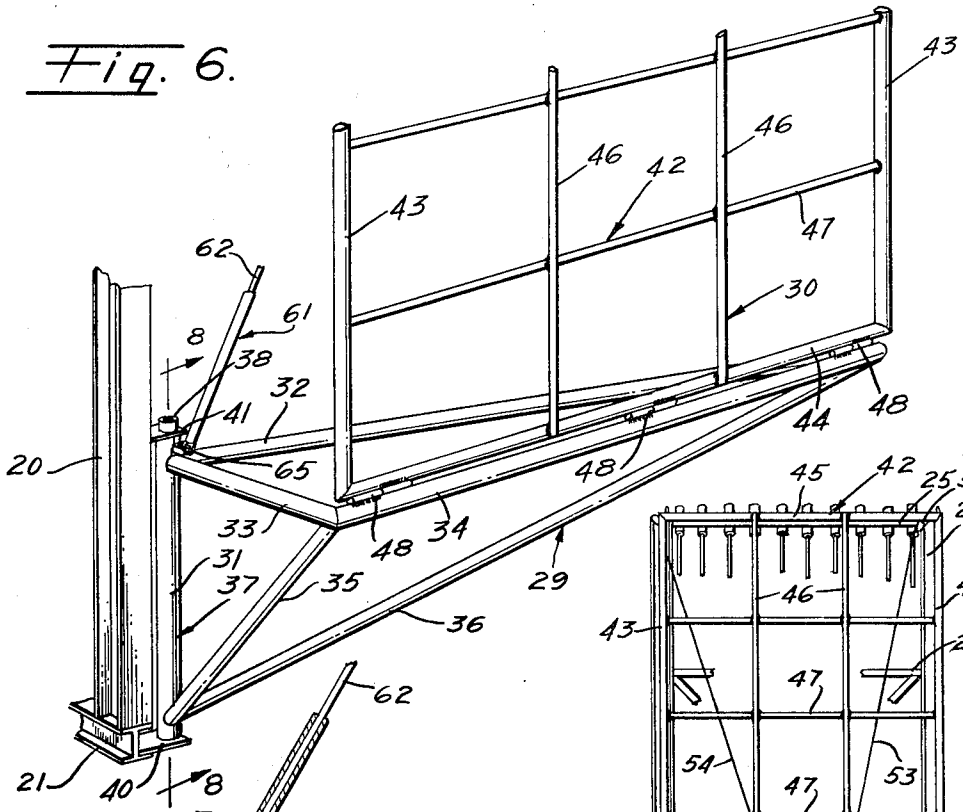

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Fig. 6.



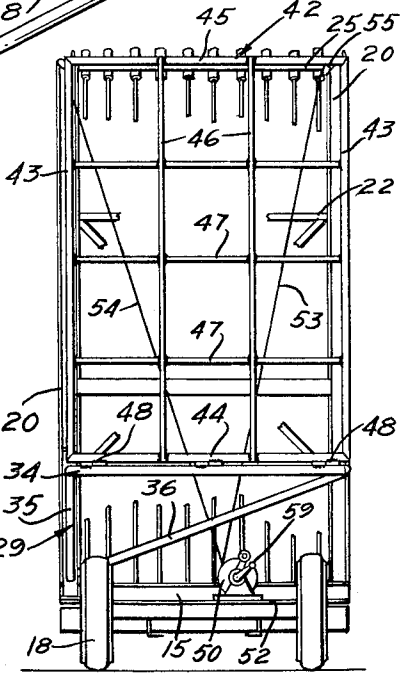




Fig. 5.

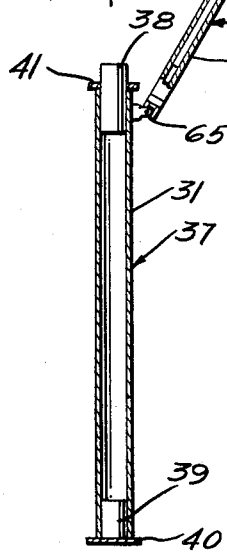
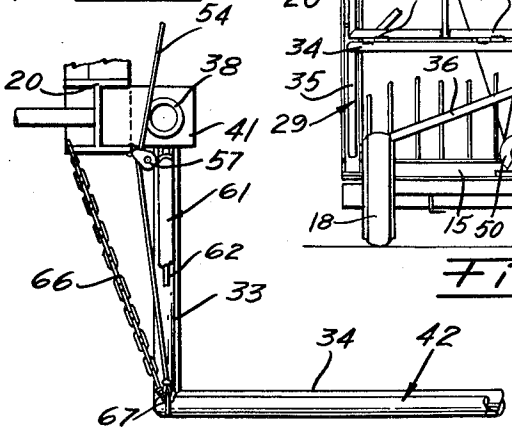



Fig. 8.

Fig. 7.




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2,914,134

# VEHICLE MOUNTED LADDER

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Original application June 6, 1956, Serial No. 589,670. Divided and this application August 2, 1957, Serial No. 676,025

5 Claims. (Cl. 182—127)

My invention relates to means mounted on a vehicle for facilitating score-marking therefrom of military targets situated on a practice range, and it is a division of my pending application Serial No. 589,670 filed June 6, 1956, for military practice target-supporting vehicle and means facilitating score-marking targets.

It is a purpose of my present invention to provide means for facilitating score-marking of a military target from a vehicle which may or may not be equipped to transport targets to a practice range, and which means includes a ladder mounted on the vehicle so as to enable one to climb and reach all parts of a target set up on a practice range, for score-marking thereon the hits made by a gunner.

It is also a purpose of my invention to provide a vehicle, a ladder, and means for mounting the ladder on the vehicle to occupy one position in which it is disposed at one side of the vehicle so that the ladder can be climbed to score-mark a target as set up on a practice range, and when not in use to occupy another position on the vehicle in which it is disposed to the rear thereof so as not to increase the over-all width of the vehicle and interfere with movement of the vehicle over a highway.

A further purpose of my invention is to provide manual or power-operated means for moving the ladder to either of the aforesaid positions and securing the ladder in either of said positions, said means being operable to support the ladder when in position for score-marking in substantially spaced parallelism to a set-up target irrespective of the angular position of the target with respect to the vertical, in order that one marking the target can have ready access to all parts thereof.

I will describe only one means for facilitating score-marking of a military target embodying my invention, and in association with one form of vehicle, and will then point out the novel features thereof in claims.

In the drawings:

Fig. 1 is a view showing in rear end elevation one form of vehicle having applied thereto one form of means for facilitating score-marking of a military target, and wherein the ladder of such means is in position for score-marking.

Fig. 2 is a fragmentary side elevation of the vehicle shown in Fig. 1, with the ladder and its supporting means in that position at the rear end of the vehicle which it occupies when not in use.

Fig. 3 is a top plan view of Fig. 1.

Fig. 4 is a top plan view of Fig. 2.

Fig. 5 is a rear end elevational view of Fig. 2.

Fig. 6 is an enlarged fragmentary perspective view of the ladder and its supporting means when in the position shown in Fig. 4.

Fig. 7 is an enlarged vertical sectional view taken on the line 7—7 of Fig. 1.

Fig. 8 is an enlarged vertical sectional view taken on the line 8—8 of Fig. 6.

Referring more particularly to the drawings, my invention includes a vehicle which may be in the form of



a four-wheeled trailer, although in the drawings only the rear end portion of the trailer has been shown. This vehicle includes a frame 14 made up of a pair of transversely spaced longitudinal beams 15 rigidly connected at intervals by transverse beams 16. On the rear ends of the beams 15 is supported an axle 17 on the ends of which are rear wheels 18.

Fixed on the frame 14 is a superstructure of rectangular skeleton form, and while it is designed to support a plurality of military targets thereon, only those parts thereof will be described necessary to an understanding of the present invention.

This superstructure includes a pair of beams 20 secured in vertical position and in spaced parallelism, on a cross beam 21 secured to the side beams 15 adjacent the rear ends of the latter. These beams 20 are suitably braced by transverse struts 22, cross struts 23, and lower and upper transverse beams 24 and 25. Diagonal struts 26 may be employed to further brace the vertical beams 20. Lower and upper horizontal struts 27 and 28 are employed to further brace the beams 20 and it will be understood that these struts are extended forwardly for rigid connection to a pair of similar vertical beams fixed on the frame 14 and not herein shown.

The means for facilitating score-marking of a target of the type used on a military practice range comprises, in the present instance, a ladder supporting frame 29 shown in Figs. 5 and 6 as comprising a vertical member 31 to the upper end of which are secured members 32 and 33 arranged at angles to each other, and a third member 34 fixed at one end to the member 33 and at the other end to the member 32. These members may be in the form of metal pipes and are connected one to the other in a triangular arrangement.

A relatively short member 35 is fixed to the lower end of the member 31 and to members 33 and 34 at the juncture thereof. Another member 36 is connected to the lower end of the member 31 at one end and to the rearmost ends of the members 32 and 34 at the other end. These members 35 and 36 likewise may be in the form of metal pipes and, manifestly they serve to support the triangular frame formed by the members 32, 33 and 34.

The member 31 is of tubular form and constitutes part of a hinge 37 by which the supporting frame 29 is mounted for swinging movement about a vertical axis to occupy a position at the rear of the beams 20 as shown in Figs. 2, 4 and 5, or to occupy a position at one side and to the rear of the superstructure as shown in Figs. 1 and 3. The remainder of the hinge 37 comprises pins 38 and 39 extending into and on which the member 31 is rotatable. The lower pin 39 is fixed to a bracket 40 which is, in turn, fixed to one of the side beams 15, while the upper pin 38 is fixed in a bracket 41 secured to one of the vertical beams 20.

The means of my invention for facilitating score-marking also includes a ladder 42, best shown in Figs. 5 and 6 as comprising vertical members 43, a lower horizontal member 44, and an upper horizontal member 45. These members are rigidly connected one to the other by vertical rods 46, and horizontal rods 47, the latter constituting rungs. The lower member 44 is, by hinges 48, pivotally mounted on the member 34 for swinging movement about a horizontal axis so that when the supporting frame 29 is at the rear of the beams 20 the ladder 42 can occupy a vertical position in spaced parallelism to the beams. Moreover, when the supporting frame is swung to the position shown in Figs. 1 and 3, in which it is disposed at one side of and to the rear of the superstructure, the ladder 42 can be moved to a position inclined to the vertical so as to dispose it in substantial parallelism to a target 19 supported in inclined position on the ground.

Means is embodied in my invention for moving the

supporting frame **29** and the ladder **42** to the position shown in Figs. 2 and 4, and for holding the ladder in the position shown in Figs. 1 and 3. This means comprises, in the present instance, a drum **50** mounted for rotation in a bracket **51** fixed to a platform **52** secured on the beams **15**. This drum **50** has two diameters with a cable **53** wound upon the larger diameter, and a cable **54** wound upon the smaller diameter.

The cable **53** is extended upwardly from the drum **50** through an eye or pulley **55** at the upper end of one of the beams **20**, and then anchored, as at **56**, to one upper corner of the ladder **42**. Cable **54** is extended upwardly from the drum **50** through an eye or pulley **57** at the upper end of the other beam **20**, and then anchored, as at **58**, to the other upper corner of the ladder. The drum **50** is provided with a hand crank **59** by which it can be turned, and a conventional releasable latch **60** for securing the drum against rotation.

To prevent tilting of the ladder **42** rearwardly from any forwardly inclined position which it may occupy for score-marking, an extensible arm **61** is so constructed and associated with the ladder and the hinge member **31** as to limit rearward tilting movement of the ladder past the vertical position shown in broken lines in Fig. 1. In so doing a person on the ladder is prevented from falling therefrom due to such rearward tilting.

As best shown in Figs. 1 and 8, the arm **61** is composed of a rod **62** secured at its upper end to the ladder by a swivel **63**, and a tube **64** secured at its lower end to the hinge member **31** by a swivel **65**. The rod **62** telescopes within the tube **64** to allow movement of the ladder forwardly to occupy any desired angular position away from the trailer, but it restricts movement in the other direction to the vertical by the upper end of the tube abutting the swivel **63**.

A safety feature additional to the one served by the arm **61**, is provided by a short length of chain **66** which is permanently connected at one end to the upper end of one of the beams **20**, and detachably connected at its other end by a hook **67** to the adjacent upper corner of the ladder **42**. This chain **66** is not of a length to interfere with forward angular adjustment of the ladder, and should the cable **54** break or the drum accidentally become unlatched, it will prevent the ladder from falling forwardly against the target and damaging the latter, and injuring anyone on the ladder.

Of course in the intended use of my present invention, it is adapted to be associated with a vehicle of the form shown which is designed to transport a plurality of targets **19** to a target practice range where they are singly removed and placed against a pair of inclined posts **70** (Fig. 1) which are driven into the ground. Discarded automobile tires **71** surround the lower ends of the posts upon which the target is adapted to rest.

After a target has been used for a gun practice the hits scored by each gunner on a target are marked with a paint of a distinguishing color. This score-marking is done following each use of a target by a particular gunner and while the target is set up on the range.

In the use of my invention to score-mark the target **19** shown as set-up in Fig. 1, the trailer with the supporting frame **29** and the ladder **42** positioned at the rear of the beams **20** as shown in Figs. 2 and 4, is moved to a position in which its rear end is opposite the target. The frame **29** is now swung from the position shown in Fig. 4 to that shown in Figs. 1 and 5, with the ladder **42** held in vertical position thereon by the cables **53** and **54**.

To permit of such movement of both the frame and the ladder, it is first necessary to unlatch the drum **50** whereupon cables **53** and **54** can unwind therefrom. Once the frame and ladder have reached their final positions to the side of the trailer, the drum is reversely rotated to take up all slack in the cables, and then relatched. Since the ladder is hingedly mounted on the frame **29**, its outward angle of inclination can be varied, through adjustment of the cables, to position it substantially parallel to the inclined target **19** so that one, by climbing the ladder, can reach any point on the target to score-mark the same with paint.



After one target has been score-marked the vehicle can be drawn to the next target on a practice range for score-marking it without movement of the ladder in relation to the superstructure, assuming, of course, that the next target is at the same angle as the first target. If it is at a different angle the ladder can, through the cables, be adjusted accordingly.

After the vehicle has served its purpose of facilitating marking of the several targets on a practice range, it can be driven onto and along a highway to any destination without exceeding in width that prescribed by most state highway laws, by moving the supporting frame **29** and the ladder **42** back to the position shown in Figs. 2 and 4, wherein it will be noted that the length of the frame and the width of the ladder do not exceed the width of the superstructure, and that the width of the superstructure corresponds substantially to the spacing of the wheels **18**. Movement of the ladder and frame back to the position shown in Figs. 2 and 4, is effected by rotating the drum **50** so as to wind the cables **53** and **54** thereon, when by relatching the drum, the cables serve to secure the frame and ladder in that position.

Although I have herein shown and described only one means for facilitating score-marking of a military target embodying my invention, it is to be understood that various changes and modifications may be made therein without departing from the spirit of the invention and the spirit and scope of the appended claims.

What I claim is:

1. A vehicle including a frame; a superstructure fixed on the frame; a ladder; means for supporting the ladder on the superstructure so that it can swing about a horizontal axis and a vertical axis; and cable and winch means on the frame connected to the ladder and to the superstructure for controlling movement of the ladder about said axes.

2. A vehicle including a frame; a superstructure fixed on one end of the frame; a supporting frame pivoted on the superstructure for movement about a vertical axis; a ladder pivoted at its lower end on the supporting frame for movement about a horizontal axis; a drum on the vehicle frame; a pair of cables wound on the drum, one of the cables movably connected to the superstructure at one upper corner thereof and anchored to one upper corner of the ladder, and the other cable movably connected to the superstructure at the other upper corner thereof and anchored to the other upper corner of the ladder; and means fo rotating the drum.

3. A vehicle including a frame; a superstructure fixed on one end of the frame; a supporting frame pivoted on the superstructure for movement about a vertical axis; a ladder pivoted at its lower end on the supporting frame for movement about a horizontal axis; a drum of two diameters mounted on the vehicle frame; and a pair of cables, one of which is wound on the larger diameter of the drum, movably connected to one upper corner of the superstructure, and anchored to one upper corner of the ladder, and the other of which is wound on the smaller diameter of the drum, movably connected to the other upper corner of the superstructure, and anchored to the other upper corner of the ladder; means for rotating the drum; and means for latching the drum against rotation.

4. A vehicle as embodied in claim 3, wherein an extensible arm is connected at one end to the supporting frame, and at the other end to the ladder so as to limit pivotal movement of the ladder in one direction.

5. A vehicle, including a frame; a superstructure of rectangular form fixed on the frame; a supporting frame of angular form pivotally connected at one corner thereof

to one corner of the superstructure for swinging movement to occupy one position in which it is disposed transversely of the superstructure at one end thereof, and another position in which it is disposed to one side of the superstructure; a ladder comprising a pair of vertical members, a horizontal member connecting the lower ends of the vertical members, vertical rods between the vertical members and fixed to the horizontal member, and rungs spanning the vertical members and the rods, fixed thereto, and spaced one from the other along the length thereof; a hinge connection between the horizontal member and the supporting frame allowing adjustment of the



ladder on the supporting frame about a horizontal axis; and means on the vehicle frame capable of holding the ladder against movement in one direction about said axis.

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