March 6, 1962 J. N. E. SUNDSTRÖM 3,023,674

WHEELED GUN CARRIAGE

Filed March 23, 1959 2 Sheets-Sheet 1

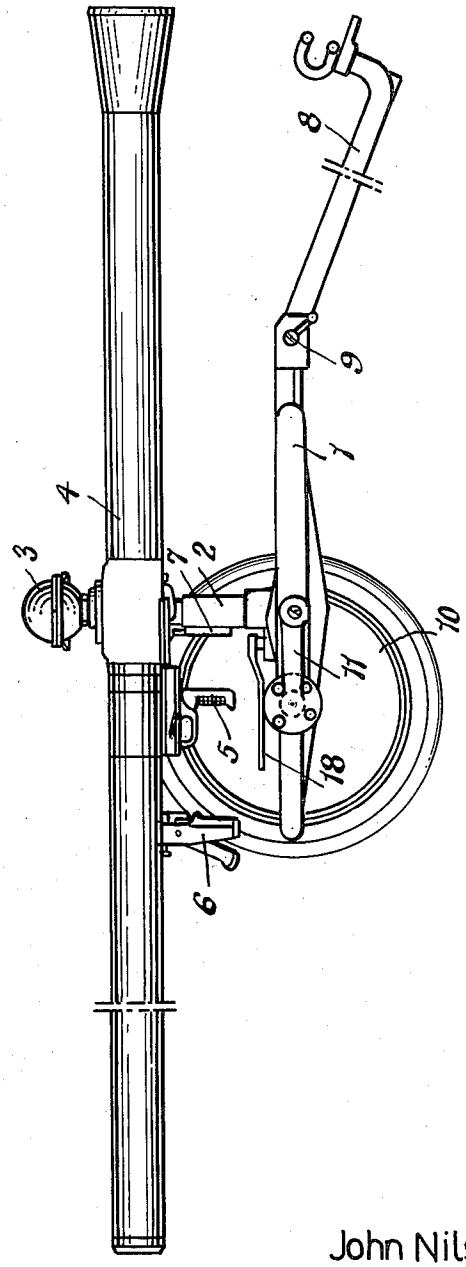

FIG. 1.

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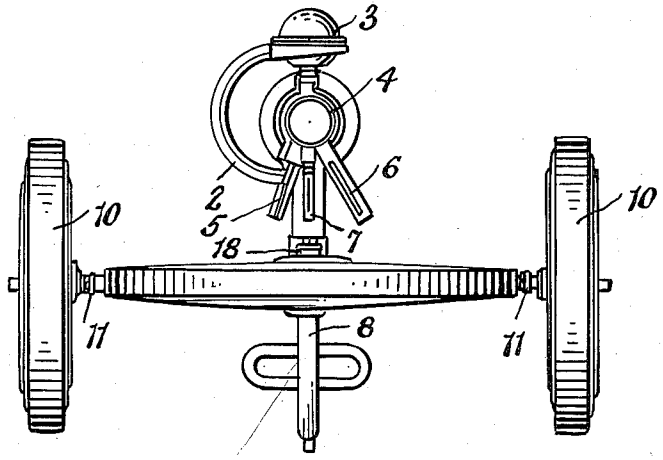

FIG. 2.

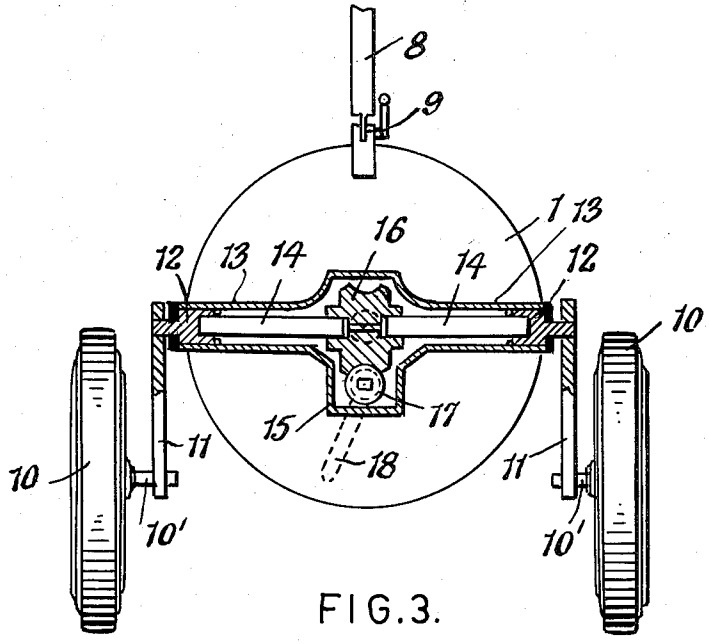

FIG. 3.

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WHEELED GUN CARRIAGE

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1 Claim. (Cl. 89—40)

The invention described below refers to a vehicular gun carriage construction in connection with wheeled gun carriages, especially for non-recoiling guns, equipped with one pair of support wheels cradled in swinging arms with torsion bar spring suspension.

One objective of the invention is the designing of a carriage of this type which makes possible the fast and effective adapting of the fire height-level to the topographical variations of the terrain in order that the gun and its crew always expose the smallest possible target area to the enemy. One additional objective of the invention is to make possible the fast adapting of the fire height-level by the gunner when being in firing position.

The invention is principally characterized by the fact, that the torsion bars are arranged to be given an adjustable torsional setting at their un-rotatably fixed ends by a joint device for turning said ends, the setting changing the height level of the carriage in relation to the wheel-pair. Further characteristics may be that the device for turning said ends is constituted by a worm gear in which the hub of the screw wheel non-turnably receives the ends of the torsion bars and that the device for turning said ends is arranged in a center plane between the wheels and that it is manually adjustable e.g. by means of a ratchet wrench.

The invention is described in detail by means of the attached drawing in which FIG. 1 shows a side view of a carriage according to the invention, equipped with a non-recoiling gun and with one wheel removed. FIG. 2 shows a front view of carriage with gun and FIG. 3 shows, partly in section, a schematic plan view of the carriage seen from above.

The carriage is provided with a gunner platform 1 that carries in a laterally turnable way a vertically extending pivot support yoke 2 supported on an upturned pin (not shown). At the upper end, the support yoke constitutes a hold for a ball joint means 3 in and under which the firing tube 4 of the non-recoiling gun is mainly balanced and suspended. Immediately in front of the pivot yoke 2 the firing tube 4 is equipped with a firing grip or fire control means 5 directed downwards and obliquely to the right, and slightly further in front of the firing grip or control portion there is a grip 6 of a firing tube aiming means, said grip 6 being directed downwards and obliquely to the left which grip operates a ball joint brake (not shown) that when disengaged holds the ball joint 3 in a braked position. If the grip 6 is actuated the ball joint 3 is released enabling the gunner to point the firing tube 4 towards the target with aid of sight and bead. A transportation lock 7 (not shown in detail) is provided for the locking of the firing tube in the pivot yoke when the piece is under transportation or being moved. The gunner platform 1 may be supported e.g. in the horizontal position by means of a supporting leg articulated with the platform or a draw bar means 8 the inclination of which towards the ground is adjustable at the link 9.

The carriage platform 1 is provided with a pair of support wheels 10 which include inwardly extending stub axles 10' that are cradled to rotate on the one end of swinging arms 11. The other end of these arms carry rotary bearing elements 12 fixed to the ends of the arms 11 and

which are supported so at to permit a rotation in the ends of tubes 13 mounted in the interior of the platform 1, to provide a fixed support for the outer ends of torsion bars 14 located in the tubes 13, which torsion bars constitute a spring suspension for the carriage wheels 10 by the inner ends of the torsion bars 14 being braced against torsional movement.

The carriage platform 1 is arranged to be adjustable in the vertical direction in order that the firing level of the gun be variable. For this purpose an irreversible worm gear 16 and a vertically extending drive gear 17 is centrally provided in the interior of the platform 1. The tubes 13 are integral with a gear housing 15 and the inner ends of the torsion bars 14, which ends are braced against torsional movement, are un-rotatably inserted from each side in a fixed position into the hub of the worm gear 16 rotatably journaled in the gear housing 15. The drive gear 17 vertically mounted in the gear housing is in meshed engagement with the worm wheel 16 and protrudes with a square end above the platform 1 immediately in front of the shaft pin of the pivot yoke 2. By means of an adjustable ratchet wrench 18 with reversible ratchet (not shown) drive gear 17 can be turned in either direction. While lying prone and firing the piece, the upper body and the elbows of the gunner rest on the platform 1. The right hand holds the firing grip while the arm encircles the base of the pivot yoke 2. The left hand may operate the grip 6 engaging the ball joint brake. When the firing level is to be varied to adapt the gun to the terrain the gunner seizes, without otherwise changing position, the ratchet wrench 18 and turns by means of the wrench the worm gear 17 in either direction. This turning motion is transferred via the worm wheel 16 and the torsion bars 14 to the swinging arms 11 which raise or lower the carriage platform 1 and as a result, the gun 4, in relation to the wheels 10. When the inner ends of the torsion bars 14 are given a turning movement through rotative action of the screw wheel 16, this turning movement is transferred to the outer ends of the torsion bars and to the bearings 12 and from these bearings to the arms 11. The wheels 10, rotative on the outer ends of the arms 11, are ground-supported at this time. Every turning, as above described, of the swinging arms 11 in relation to the platform 1 will thus raise or lower the platform 1 in relation to the wheels.

I claim:

A vehicular gun carriage comprising a pair of spaced support wheels including coaxial, spaced stub axles, a pair of elongated arms secured at one end to said stub axles and extending rearwardly therefrom, a gear housing disposed between the other ends of said arms and including integral, elongated coaxial tubes terminating in spaced relation from opposed inner surface portions of said arms, bearing elements in the terminal ends of said tubes, said bearing elements including stub shafts projecting beyond the terminal ends of said tubes and fixed to said arms, elongated torsion bars disposed axially in said tubes and fixed at one end to said bearing elements, a worm gear disposed between the other ends of said torsion bars and fixed thereto, a vertically disposed drive gear meshed with said worm gear for adjusting said arms about the stub axles on said wheels, said drive gear including an upper, gunner-operated lever means, a gunner platform fixed to said tubes and disposed substantially horizontally below said lever means for permitting a gunner to lie prone thereon and have ready access to said lever means for adjusting said platform vertically with respect to said wheel stub axles, draw bar means extending from said platform and including a depending support portion for engaging a support surface, a vertically disposed support yoke journaled

on said platform, said yoke including ball joint means for suspending a firing tube above said platform, a firing tube mounted on said ball joint means and extending substantially normal to the stub axles and above said platform for universal adjustment during aiming, said firing tube including a depending firing control means adjacent said lever means immediately above said platform for ready access to a gunner lying in a prone position on said platform, and firing-tube aiming control means including an adjustment control portion depending from said firing-tube above said platform for ready access and engagement by a gunner disposed in a prone firing position on said platform.

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