ABSTRACT

A tracked vehicle is disclosed with a rotary turret on the vehicle frame; a counterweight is carried by a parallelogram linkage on one side of the frame movable between an extended position engaging a recess in the bottom of the turret to prevent undesired rotation of the turret and counterbalance a load carried by boom means on the diametrically opposite side of the turret.

2 Claims, 3 Drawing Figures
VEHICLE WITH COUNTERWEIGHT TURRET LOCK

The present invention relates to a turreted machine adapted for effecting precision handling works.

The importance of developing a mode of transporting fluids, whose growth is relatively recent, is known, which consists in conveying the fluids in underground pipes.

Up to the present time, only machines specially designed to this end were capable of laying pipes in the trenches. The main characteristic of such machines resides in that they are able to maintain a practically perfect immobility during the welding phases of the different pipe sections. It has been ascertained that the conventional public works machines such as heretofore known hydraulic shovels, were not suitable for carrying out this laying of pipes, particularly due to the absence of absolute immobility of the turret mounted to pivot on the framework of said shovels.

It is therefore realised that it would be advantageous to use the conventional machines which are less expensive to manufacture and more easily maintained than those of present special machines. However, it is also realised that the application of said conventional machines thus improved may be general and is obviously not limited simply to laying pipes as mentioned hereinabove, but is on the contrary advantageous for all works, for which it is desired, with a conventional machine with pivoting turret, to effect a precision handling requiring that the turret be strictly immobilised with respect to the frame as well as a satisfactory equilibrium.

The invention proposes such a machine, adapted to the effecting of precision handling works, and constituted by a frame provided with rolling members, by a turret which is mounted to pivot on the frame and to which is coupled an operating equipment and by a device for selectively blocking the pivoting of the turret comprising blocking members coupled to one of the elements, frame or turret, and complementary members coupled to the other element, turret or frame, said locking and complementary members being able to cooperate in order to prevent the turret from pivoting.

In addition, this machine comprises a counterweight which is adjustably coupled to one of the two elements, frame or turret, one of the groups of blocking or complementary members being coupled to said counterweight.

This counterweight is preferably coupled to one of the sides of the frame by means of a connection constituting a deformable quadrilateral, whilst a locking plate is integral with said counterweight, and is capable of being inserted, when this counterweight is in working position, between the two arms of a stirrupshaped member integral with the turret.

Finally, and in a manner known per se, it is advantageous if a plane of clearance of the working equipment, which is substantially perpendicular to the longitudinal axis of the frame, corresponds to the position of blocking of the pivoting of the turret with respect to the frame.

The invention will be more readily understood with reference to the accompanying drawings, in which:

FIG. 1 is an elevational view of a machine according to the invention, in its position of precision handling;
FIG. 2 is a section along II—II of FIG. 1;
FIG. 3 is a view of the machine already described with reference to FIG. 1, but in a second so-called displacement configuration.

With reference now to the drawings, FIG. 1 shows a machine which is constituted of a conventional hydraulic shovel, which comprises a frame 1 provided with endless tracks 2. On the frame 1, a turret 3 is mounted to pivot about an axis 4. Moreover, an operating equipment 5 which comprises, in the present case, a digging bucket 6 is articulated to the turret 3 about an axis 8. There is coupled to the bucket 6 a pulley block 9 which comprises a hook 10, from which is suspended a section of pipe 11 by means of a rope 12. The section of pipe 11 is suspended above the trench which was dug previously.

It will be noted that a movable counterweight 7 is coupled to the frame 1 by means of a deformable parallelogram 14, whose configuration is adjusted by a jack 15. The counterweight 7 is in fact coupled to one of the endless-track bearing carriages 16. The counterweight 7 is furthermore shown in its position away from the frame 1. It is provided with a locking plate 17 which, in this above-mentioned position, is inserted, with a very small clearance, between the two arms 18 of a stirrup shaped member which is integral with the turret 3, said stirrup in the example shown, fixed to said turret 3 by weld-beads 19.

It will have been noted that the operating equipment 5 is then disposed in a transverse plane substantially perpendicular to the direction of translation of the endless-tracks 2 and is disposed opposite the counterweight 7 which balances the mass thereof.

FIG. 3 shows the same machine, but this time the locking plate 17 is disengaged outside the stirrup. The turret 3 has pivoted so that the operating equipment 5 is disposed in a plane parallel to the direction of translation of the endless tracks 2. Moreover, the counterweight 7 has been disposed, by deformation of the parallelogram 14, along the turret 3 so that the lateral bulk of said counterweight 7 is very small and practically does not increase that of the shovel itself.

Of course, the machine described hereinabove comprises multiple variants, among which the following will be briefly mentioned:

the arms 18 of the stirrup could also be integral with the counterweight 7, the locking plate 17 then being integral with the turret 3;
the grouping of said plate 17 and arms 18 could be replaced by any equivalent locking device, known per se;
the plate 17 which has been rendered integral with the counterweight 7, because this counterweight exists in the machine shown, could also have been coupled to the frame 1 independently of said counterweight, particularly in the case of machines which would not comprise such a counterweight 7;
when the turret 3 is immobilised on the frame 1, the plane of the working equipment 5 could very well have been disposed other than perpendicularly to the direction of translation of the endless tracks; in particular, it could have been chosen to be parallel to said direction, this being an advantageous disposition in certain other works involving the laying of pipes in trenches.

Finally, it is known that certain turreted machines are provided with a counterweight which is mounted to move on this turret. Of course, it is further possible, in this case, to provide the concomitance of the locking
of the turret on the frame and the placing of the moveable counterweight of the turret in its position ensuring the equilibrium of the machine. Such a counterweight will of course enable a technical effect to be obtained which is similar to that of the machine described in FIG. 1, whilst enabling the equilibrium of the machine to be improved, whatever the orientation of the turret with respect to the frame, and in addition reducing the bulk in width of the shovel which would be provided therewith. These different variants may be combined as a function of the works to be carried out and are naturally in accordance with the present invention.

The advantages of the shovel which has been described will now be looked at more particularly. It will firstly be noted, with reference to FIGS. 1 and 2, that the pivoting of the turret 3 with respect to frame 1 is prevented when the locking plate 17 is inserted between the arms 18. Consequently, the turret 3 remains immobile with respect to the ground, this making it possible to carry out precision handling works, such as for example welding, before two adjacent sections 11 are laid. The machine used is, however, conventional, and consequently is not expensive to construct.

The particular constitution of the blocking device in an appendix inserted between the arms of a stirrup member is simple and leads to a production which is both effective and cheap.

The particular position of blocking shown, in which the working equipment 5 is disposed in a transverse plane perpendicular to the direction of translation of the endless tracks, is obviously well adapted to the particular work of laying pipes, since it allows the displacement of the machine along the trench even whilst the turret 3 is in working position, integral with the frame 1.

The combination of the counterweight 7 and of the plate 17 avoids having to provide the machine with a special device for placing said plate 17 in position, it being understood that the counterweight already exists for the purpose of increasing the equilibrium of the machine.

What we claim is:

1. A work vehicle having a vehicle frame supported by ground-engaging rolling members, a turret mounted to pivot about a vertical axis on the vehicle frame, work supporting means mounted on said turret and extending outwardly from said turret, a deformable quadrilateral support frame connected on one end to one side of said vehicle frame, a counterweight supported by said quadrilateral support frame, a stirrup carried on the lower portion of said turret comprising two spaced arms, a locking plate integral with said counterweight, said deformable quadrilateral frame being movable between a first or retracted position in which the counterweight is closely adjacent the vehicle frame and an extended position in which said locking plate is engageable with said stirrup between said spaced arms to lock said turret against rotation while simultaneously providing a counterweight function for said vehicle.

2. The invention of claim 1 wherein said counterweight is partially positioned inwardly of the outer side extremities of said vehicle when said deformable quadrilateral frame is in said retracted position so as to minimize the width of the vehicle.

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