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(54) Duplicate control station for motor vehicle mounted hydraulic cranes with dual controls.

(57) The duplicate control station (4) disclosed is designed such that the two sets of handles operating the horizontally disposed directional control valve (2) can be arranged in identical fashion at both sides of the vehicle: each duplicate handle (1) is made integral with one end of a relative linkage element (5) the remaining end of which hinges with a respective rod (3) connecting with the corresponding control valve handle at the other side of the vehicle. The linkage elements (5) are coaxial with and freely rotatable in relation to one another.

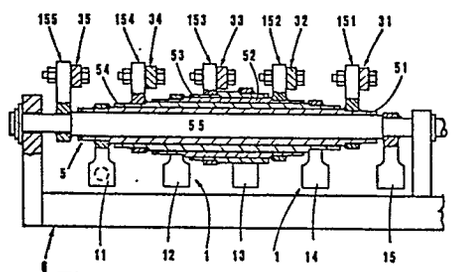

FIG 2

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Description

Duplicate control station for motor vehicle mounted hydraulic cranes with dual controls

The invention relates to the field of dual controls for motor-vehicle-mounted hydraulic cranes, and more exactly, to a duplicate control station of the type which comprises a set of handles that operate a horizontally disposed directional control valve by way of respective rods. In such systems, the control valve handles and the duplicate handles are located at opposite sides of the motor vehicle.

Conventional dual control vehicle-mounted hydraulic cranes are located between cab and body, and can be worked from either side of the vehicle, by way of a directional control valve of the type provided with a system of levers and manually operated horizontal handles.

As the operator may need to work at either side of the vehicle, a duplicate set of handles is provided at the side opposite that to which the control valve is fitted.

The most simple type of dual control system makes use of a set of substantially parallel rods, each of which connects one of the duplicate handles with the corresponding handle of the control valve. In such a system, however, positioning of the duplicate set of handles dictates that the operator must find them arranged in a sequence dissimilar to that of the valve handles when turning about face through 180° in other words, the operator is confronted with sets of handles that are reversed, or 'mirrored' at each side of the vehicle.

Another disclosure by the same applicant sets forth the idea of connecting the handles at opposite sides of the vehicle by way of flexible cables, in such a way that the two sets are disposed in identical fashion regardless of the operator's standpoint, and corresponding handles will produce an identical movement of the crane.

In another embodiment, the dual controls are linked by rigid tie-rods crossed one over the other such that the positions of the control valve and the duplicate handles remain the same.

In an embodiment of this type, one achieves the end of obtaining identical positions for the two sets of handles, though the structure of the entire dual control assembly (the control valve, linkage and duplicate station) is rendered somewhat complex; the likelihood of breakdown becomes greater, and lack of continuity in response is caused by non-axial forces impinging on the valve sections.

Accordingly, the object of the invention disclosed is that of overcoming the aforementioned drawbacks. The stated object can be achieved with a duplicate control station as described and claimed herein. Each handle of the duplicate set of controls is connected to a respective rod by way of a linkage element, and each such linkage element is coaxial with and rotatable independently of the remaining elements.

One advantage of the invention consists in the extreme simplicity of the duplicate control station, a feature which both ensures marked economy and guarantees practical, faultless operation of the hydraulic crane's dual controls.

Another advantage is that of the facility of keeping control rods substantially parallel with each other, which limits the number of likely breakdown hazards inasmuch as there is no need whatever for complex linkage systems of the type required in conventional crossed rod connections.

The invention will now be described in detail, by way of example, with the aid of the accompanying drawings, in which:

-fig 1 shows a plan of the front part of a motor vehicle having a hydraulic crane with dual controls which incorporate the duplicate control station of the invention;

-fig 2 is the frontal view of a duplicate control station according to the invention, in which certain parts are cut away better to reveal others.

With reference to fig 1, a hydraulic crane 10 of the type in question is usually bolted to the platform 9 of a motor vehicle, or truck, between the body 7 and the cab 8. The crane 10 is manoeuvred manually by the operator, who works a hydraulic directional control valve 2 located at one side of the vehicle. 4 denotes a duplicate control station, that is, a duplicate set of controls located at the opposite side of the vehicle, from which the control valve 2 is operated by way of a set of rods 3 running across the vehicle.

The duplicate control station 4 according to the invention (see fig 2) consists in a set of linkage elements 5 (the drawings show five, denoted 51, 52, 53, 54 & 55), one to each of the duplicate handles 1 (denoted 11, 12, 13, 14 and 15 respectively); such elements are coaxial with each other, and freely rotatable in relation to one another.

The innermost element 55 is supported at each end by a U-shaped component 6 issuing from the main frame of the crane 10, and capable of no other movement than rotation about its own axis. The ends of the element 55 adjacent to the uprights of the U-shaped component 6 are integral, on the one hand, with the end of a first duplicate control handle 15, and on the other, with a crank 155 to which the respective rod 35 is attached.

The linkage element denoted 51 is tubular in shape, and ensheaths the stretch of the element denoted 55 between the first handle 15 and the crank 155. This element 51 is freely rotatable in relation to that denoted 55, and its two ends are integral, on the one hand, with the end of a second duplicate handle 11 positioned adjacent to the crank denoted 155, and on the other, with a crank 151 to which the relative rod 31 is attached.

In similar fashion, a linkage element denoted 54 ensheaths the stretch of the element denoted 51 between its control handle 11 and crank 151, and is integral with a third duplicate control handle 14 at the one end, adjacent to the crank denoted 151, and at the other, with a crank 154 to which the relative rod 34 is attached. This element 54 is ensheathed by the

element denoted 52, and the latter ensheathed in its turn by a further element 53.

Thus, one has a succession of duplicate control handles 11, 12, 13, 14 and 15 which run left to right, as seen in the drawings. The corresponding rods 3, on the other hand, are disposed in reverse order, i.e. 35, 34, 33, 32 and 31, likewise viewing left to right, and accordingly, will be disposed substantially parallel with one another given that the handles of the control valve 2 are positioned in corresponding sequence 25, 24, 23, 22 and 21 at the other side of the vehicle (fig 1), viewed similarly from left to right.

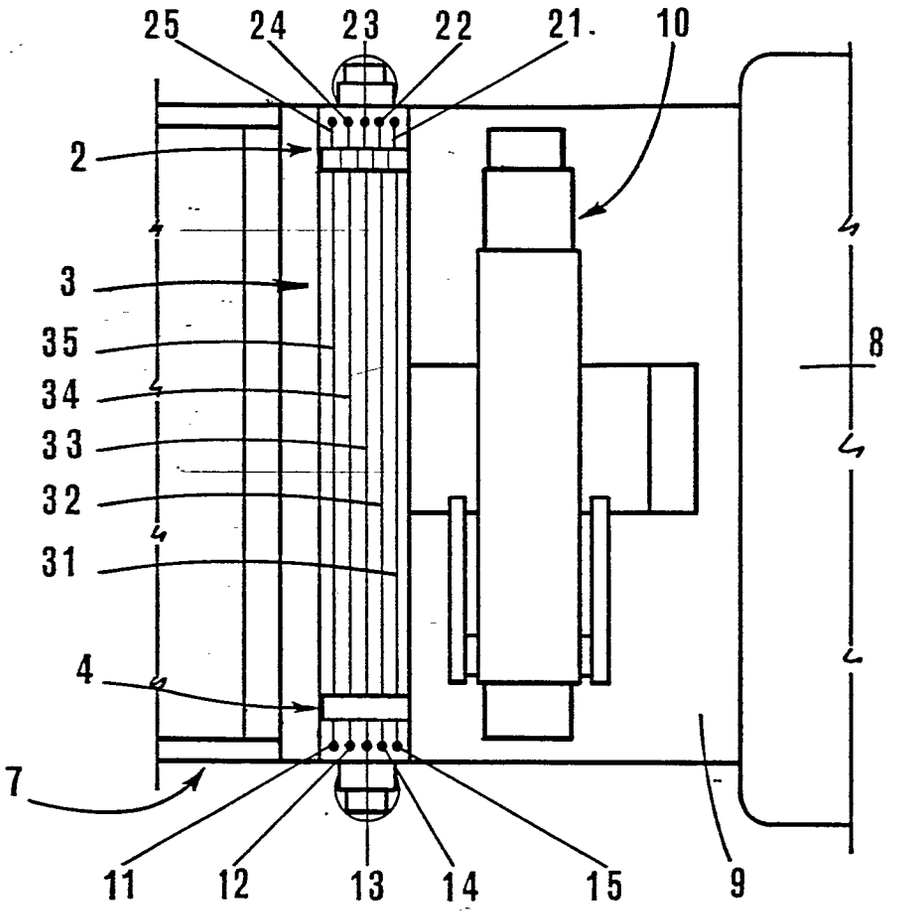
Claims

1) A duplicate control station for motor-vehicle-mounted hydraulic cranes provided with dual controls consisting in a horizontally disposed directional control valve (2) located at one side of the vehicle and a duplicate control station (4) located at the other which incorporates a set of handles (1) that operate the directional control valve (2) by way of respective rods (3),
characterized
in that each duplicate handle (1) is integral with one end of a relative linkage element (5) the remaining end of which is attached to the respective rod (3), and
in that the linkage elements (5) are coaxial with and freely rotatable in relation to one another.

2) Duplicate control station as in claim 1, wherein each linkage element (5) ensheaths the next, and each relative duplicate handle (1) is positioned alongside the rod (3) of the linkage element by which its own linkage element is ensheathed.

3) Duplicate control station as in claim 1, wherein the innermost linkage element (55) is longer than the remainder and is supported at either end by a U-shaped component (6) issuing from the main frame of the crane.

FIG1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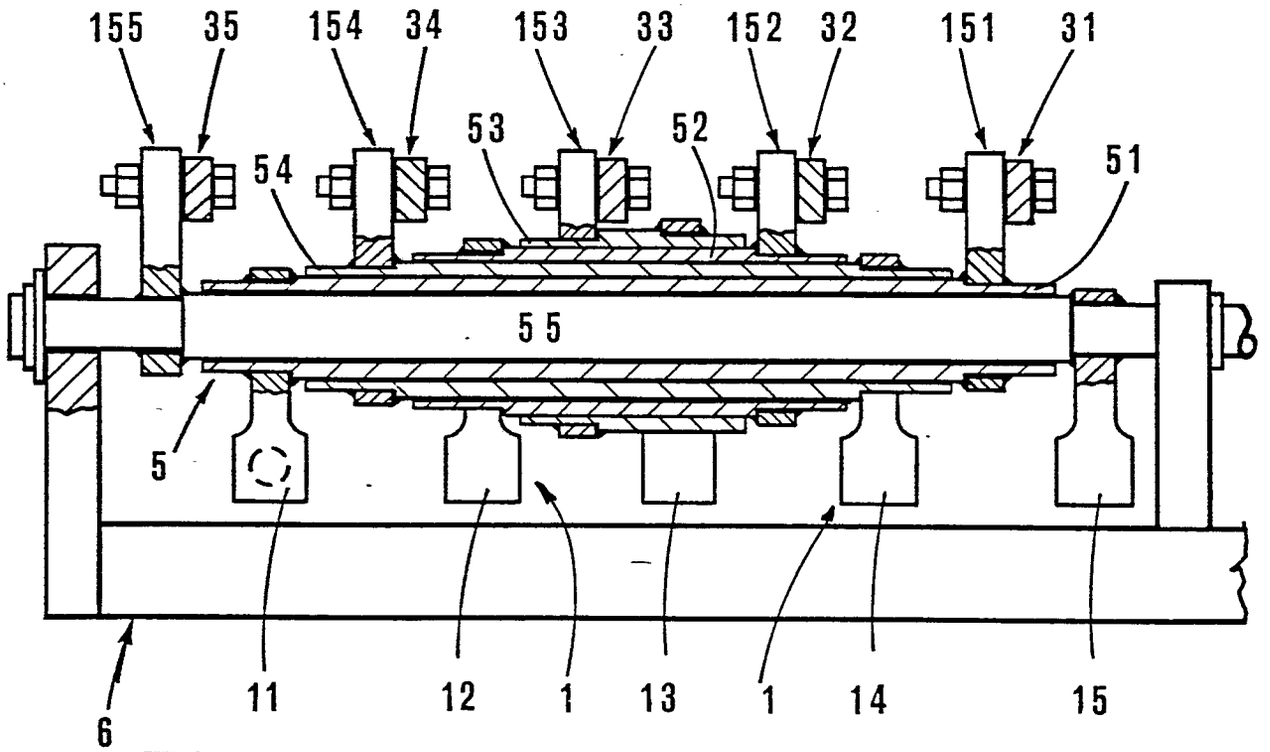
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FIG2