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

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Description

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 (e.g. GB-A 2 116 937), 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 and each handle and rod is perpendicular to the linkage element.

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 (4) for motor-vehicle-mounted hydraulic cranes (10) provided with dual controls (2, 4) consisting in a horizontally disposed directional control valve (2) located at one side of the vehicle and a duplicate control station 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), in that the linkage elements are coaxial with and freely rotatable in relation to one another, and in that each handle and rod is perpendicular to the linkage element.

2) Duplicate control station as defined in claim 1, wherein each linkage element (5) surrounds 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 surrounded.

3) Duplicate control station as defined 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.

Patentansprüche

1. Zwillingsbedienungsstand (4) für hydraulische Krane (10) auf Kraftfahrzeugen mit Doppelbedienung (2, 4), bestehend aus einem horizontal angeordneten Steuerventil (2), das sich auf der einen Seite des Fahrzeugs befindet, und aus einer zweiten Steuerstation auf der anderen Seite, welche eine Reihe von Griffen (1) enthält, die das Steuerventil (2) über entsprechende Stangen (3) bedienen, dadurch gekennzeichnet, daß jeder dieser doppelten Griffe (1) mit dem einen Ende von einem entsprechenden Vorgelegeelement (5) fest verbunden ist, dessen verbleibendes Ende an der jeweiligen Stange (3) befestigt ist, und dadurch, daß die Vorgelegeelemente koaxial und frei drehbar zueinander verlaufen, und dadurch, daß jeder Griff und jede Stange rechtwinklig zu dem Vorgelegeelement angeordnet ist.

2. Zwillingsbedienungsstand nach Patentanspruch 1, dadurch gekennzeichnet, daß jedes Vorgelegeelement (5) das nächste umgibt, und daß jeder entsprechende doppelte Griff (1) längs der Stange (3) des Vorgelegeelementes positioniert ist, von dem das eigene Vorgelegeelement umgeben wird.

3. Zwillingsbedienungsstand nach Patentanspruch 1, dadurch gekennzeichnet, daß das zuinnerst liegende Vorgelegeelement (5) länger als die anderen ist und an beiden Enden von einem U-förmigen Teil (6) wird, der von der Trägerstruktur des Krans ausgeht.

Revendications

1. Pose de contrôle dupliqué (4) pour grues hydrauliques (10) sur véhicules à moteur à double contrôle (2, 4) comportant une soupape de contrôle de direction (2) disposée horizontalement sur l'un des côtés du véhicule et un poste de contrôle dupliqué situé sur l'autre côté lequel est pourvu d'un jeu de poignées (1) actionnant la soupape de contrôle de direction (2) au moyen de barres respectives (3), caractérisé:

— en ce que chaque poignée dupliquée (1) est solidaire de l'une des extrémités d'un élément de timonerie respectif (5) dont l'autre extrémité est attachée à la barre correspondante (3),

— en ce que les éléments de timonerie sont coaxiaux entre eux et sont susceptibles de tourner librement l'un par rapport aux autres, et

— en ce que chaque poignée et chaque barre sont perpendiculaires à l'élément de timonerie.

2. Poste de contrôle dupliqué selon la revendication 1, caractérisé en ce que chaque élément de timonerie (5) entoure le suivant, et chaque poignée dupliquée respective (1) est positionnée à côté de la barre (3) de l'élément de timonerie par lequel son propre élément de timonerie est entouré.

3. Poste de contrôle dupliqué selon la revendication 1, caractérisé en ce que l'élément de timonerie le plus interne (55) est plus long que les autres et est supporté à ses deux extrémités par un élément en forme de "U" (6) s'étendant du bâti principal de la grue.

FIG 1

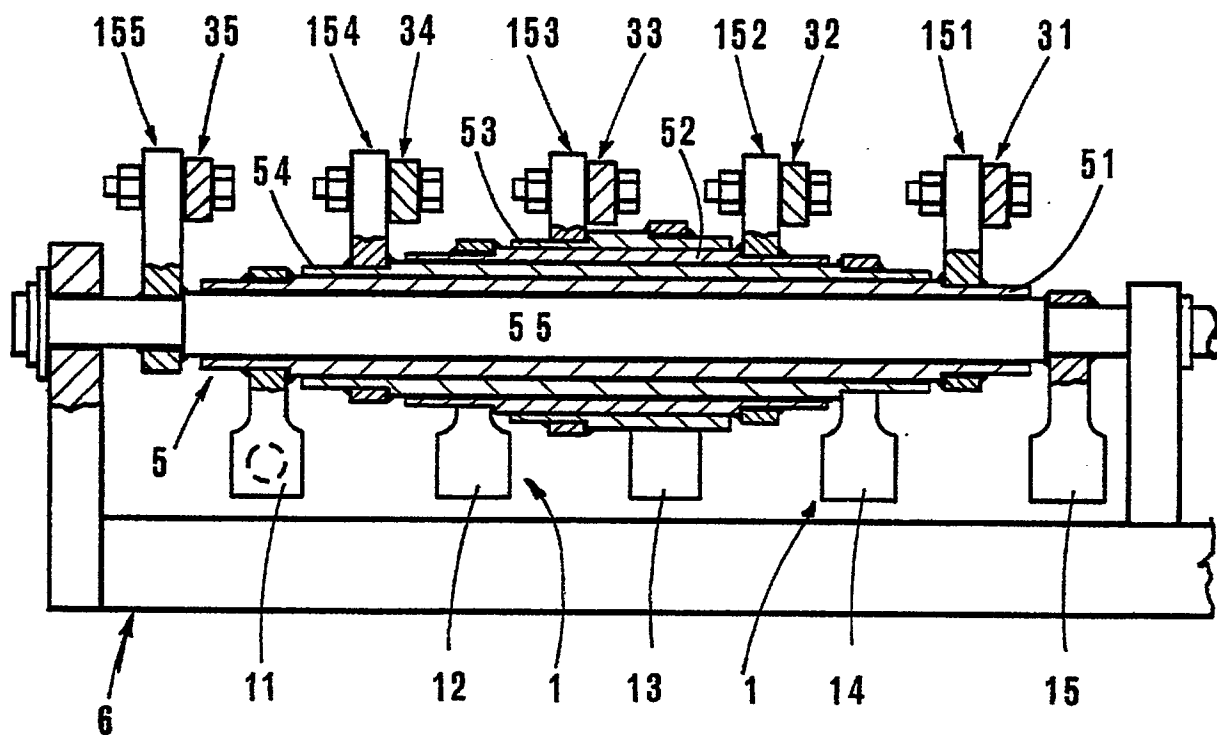
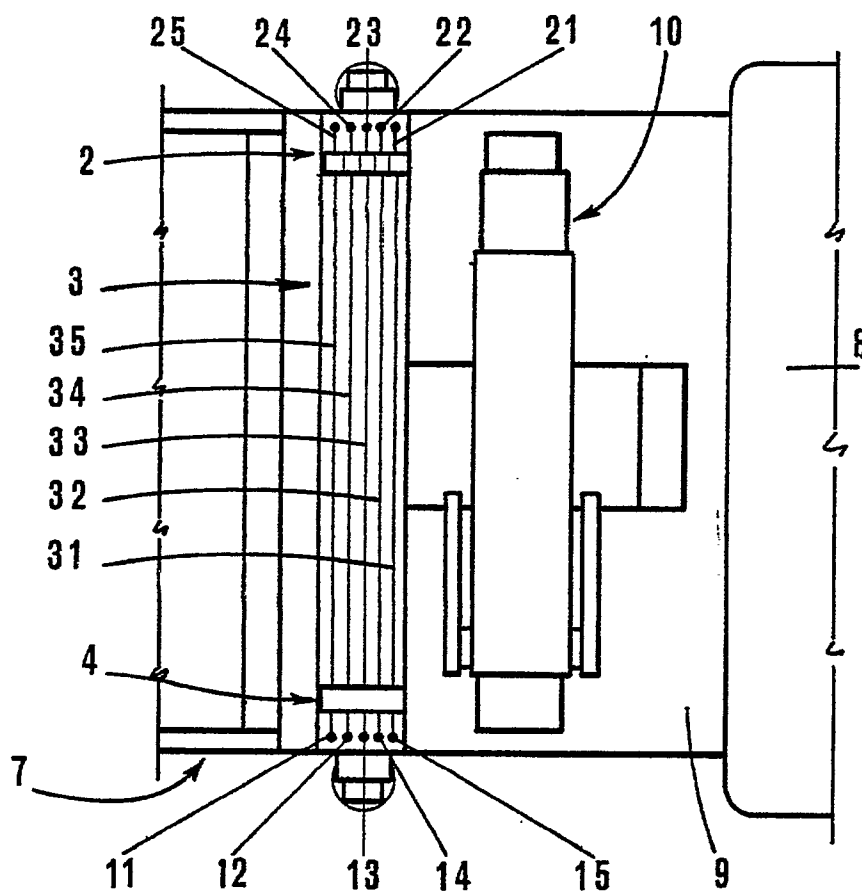


FIG 2