May 7, 1968 P. DURAND 3,381,826

TRANSLATING MEANS FOR THE COUNTERBALANCING CARRIAGES IN TOWER CRANES

Filed Dec. 22, 1966

Fig. 1

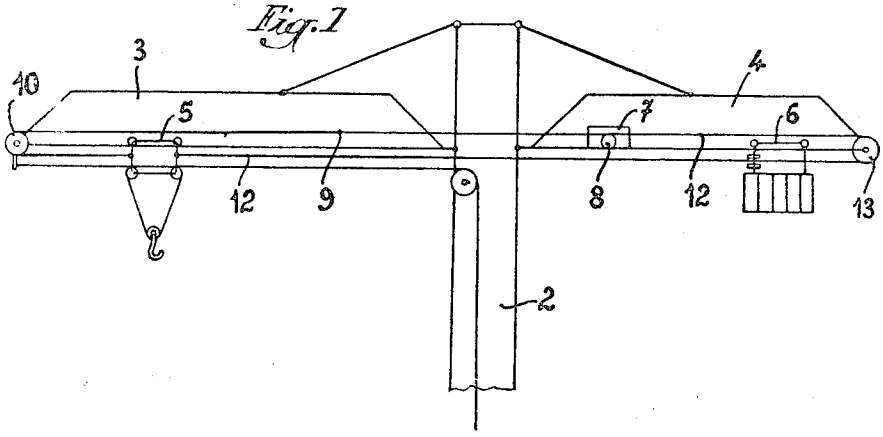


Fig. 2

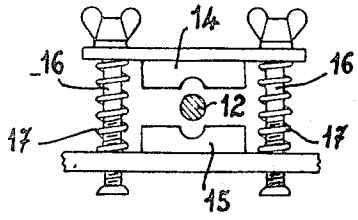


Fig. 3

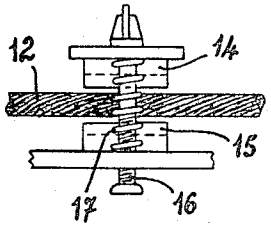
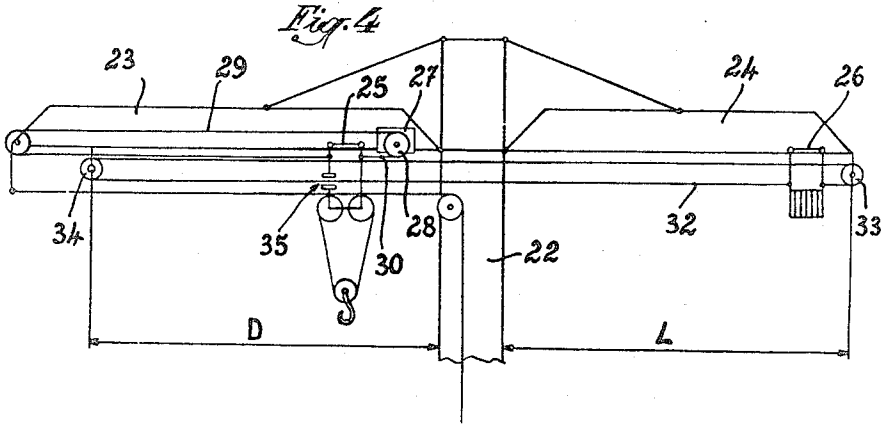


Fig. 4



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TRANSLATING MEANS FOR THE COUNTERBALANCING CARRIAGES IN TOWER CRANES

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6 Claims. (Cl. 212—48)

ABSTRACT OF THE DISCLOSURE

A device for use with a telescopic crane tower which permits the counterbalancing carriage to be moved when the tower is telescoped but which is easily disengageable when the lifting carriage is to be moved without telescoping the tower. The device is connected to either the lifting or counterbalancing carriage and is adapted to be either clamped upon the cable which draws the counterbalancing carriage or disengaged therefrom. In the clamped position the counterbalancing carriage is movable and in the disengaged position the counterbalancing carriage is stationary.

The present invention relates to an improvement in translating means for counterbalancing carriages in tower cranes.

In tower cranes the height of which can be varied by telescoping the tower, the balance weight is usually carried by a carriage adapted to be moved over the balancing jib, in order to enable the whole assembly to be balanced and to thereby eliminate the transverse stresses when lengthening or shortening the tower. Such movement of the counterbalancing carriage is usually performed either manually by means of a winch, or mechanically by means of a rotor-driven mechanism of the same construction as that used for moving the jennies on the cranes. This latter arrangement is convenient but expensive, since it requires two substantially identical mechanisms.

The present invention obviates this disadvantage by providing an improved means for drawing the counterbalancing carriage over the cable which draws the jenny, in which means are provided for making said cable temporarily integral with, or separate from, the counterbalancing carriage or an auxiliary cable secured to said carriage and having a part of its path lying under the path of the first-mentioned cable.

The appended drawing diagrammatically illustrates, by way of non-limiting examples, two embodiments of the improved arrangement according to the invention. In said drawing:

FIGURE 1 is a side elevational view of the upper part of a crane provided with one of said embodiments;

FIGURES 2 and 3 are, on an enlarged scale, detail views showing the arrangement for temporarily locking the counterbalancing carriage on the corresponding cable;

FIGURE 4 is a side elevational view of the upper part of a crane provided with a second embodiment of the invention.

Referring to FIGURE 1, 2 indicates the extensible upper portion of a crane tower, 3 indicates the jib carrying the lifting carriage, 4 indicates the balance jib, 5 indicates the lifting carriage, and 6 indicates the counterbalancing carriage.

The control mechanism for the carriages can be located either on the tower or on the jibs. In the case illustrated in the drawing, the control mechanism is positioned on the balance jib 4.

Said mechanism is exactly the same as the conventional one used for controlling the movement of lifting carriages. In the present case, it comprises a winch 7 actuated by a motor (not shown) and driving a drum 8.

The assembly according to the invention differs however from the conventional one in the way in which the two cables 9, 12, associated with drum 8 are set. As a matter of fact, one of said cables, to wit, cable 9, has one of its ends secured to drum 8 while its other end is secured to lifting carriage 5 after passing over a return pulley 10 on the end of the jib 3, but the other cable, that is, cable 12, which has also one of its ends secured to drum 8, has its other end secured to the lifting carriage 5 after passing over a pulley 13 on the end of the balance jib 4, and said second cable 12 passes under the counterbalancing carriage 6.

In addition, means are provided for fixing at will carriage 6 in position on said cable 12, and for releasing carriage 6 therefrom.

The means for fixing the carriage 6 on cable 12 is illustrated in FIGS. 2 and 3, said means consisting of two half-collars 14, 15, integral with the carriage 6 and between which the cable 12 passes. Two screws 16, 16, enable the two half-collars 14 and 15 to be tightened on the cable 12, while two springs 17, 17, are provided for spacing the two half-collars when the cable 12 has to pass freely between them, that is, during the normal operation of the crane.

As will be readily seen, the cable 12 will in fact pass freely between the two half-collars 14 and 15 when the latter are spaced apart, so that the operation of the winch 7 only results in the movement of the lifting carriage 5.

On the other hand, when it is desired to move the counterbalancing carriage 6 with a view to balancing the whole assembly to be shifted, it is only necessary, before varying the height of the tower 2, to position the lifting carriage 5 in a manner such that it does not butt into tower 2 or the end of jib 3 when the counterbalancing carriage 6 is moved, and then to fasten said carriage 6 to cable 12 by tightening the two half-collars 14 and 15 by means of the two screws 16.

In the modified embodiment illustrated in FIGURE 4, 22 indicates the extensible upper portion of a crane tower, 23 indicates the jib carrying the lifting carriage, 25 indicates the balance jib, 25 indicates the lifting carriage, and 26 indicates the counterbalancing carriage.

The mechanism for moving the lifting cariage 25 is constituted conventionally by a winch 27 the drum 28 of which draws two cables 29 and 30.

A further cable 32, both ends of which are secured to the counterbalancing carriage 26, passes over a pulley 33 positioned at the end of the balance jib 24 and, over a pulley 34 positioned on the jib 23, said pulley 34 being spaced from the tower 22 by a distance D at least equal to the length L of the balance jib 24.

The path along which the counterbalancing carriage 26 moves thus passes, for a part of its length, under the path along which the lifting carriage 25 is moved.

The lifting carriage 25 is provided with a device 35 which is the same as that shown in FIGURES 2 and 3 and makes it possible to make said carriage 25 integral with the cable 32, so that to each of its movements, an equivalent movement of the counterbalancing cariage 26 is imparted.

With this arrangement, in normal operation, that is, during the lifting operations by the crane, the counterbalancing carriage 26 is disposed at the end of the jib 24 and the lifting carriage 25 travels freely over the jib 23 without communicating its movement to the counterbalancing carriage 26, the device 35 being in the position wherein it is not integral with said carriage 25.

In contradistinction, in order to move the counterbalancing carriage **26** so as to enable the tower to be telescoped, it is only necessary to make the carriage **25** integral with the cable **32** in order that the carriage **26** moves in the same direction as the latter and comes to butt against the crane tower.

It should be noted, however, that, before said operation, the carriage **25** is disposed in a manner such that, after it has been made integral with the cable **32**, it cannot come into contact with the foot of the jib **23** or with the pulley **34** during its movements and, consequently, during those of the carriage **26**.

Obviously, and as is apparent from the foregoing, the invention is not limited to the two embodiments described above by way of non-limiting examples. It covers, on the contrary, all modifications thereof falling within the scope of the appended claims.

What I claim is:

1. A crane comprising a telescopic upright member, a lifting jib secured to the telescopic upright member, a movable lifting carriage on the lifting jib, a counterbalancing jib secured to the telescopic upright member, a movable counterbalancing carriage on the counterbalancing jib, drive means for moving the lifting carriage along the lifting jib and means operatively associated with the counterbalancing carriage for selectively engaging the counterbalancing carriage with said drive means whereby the counterbalancing carriage can be selectively moved along the counterbalancing jib when the lifting carriage is moved along the lifting jib.

2. A crane according to claim **1** wherein the drive means comprises a winch, first cable means connected to the lifting carriage and driven by the winch, second cable means selectively engageable with the means for selectively engaging the counterbalancing carriage with the drive means whereby the counterbalancing carriage is moved when said second cable means is thus engaged.

3. A crane according to claim **2** wherein the means for selectively engaging the counterbalancing carriage with the drive means is a locking means on one of the carriages adapted to lock on said second cable means.

4. A crane according to claim **3** wherein the locking means comprises a pair of half-collars between which said second cable means pass and screw means for drawinf the half-collars together to thereby lock same on said second cable means.

5. A crane according to claim **1** wherein the drive means comprises a winch, a first cable connected to the lifting carriage and driven by the winch, a second cable connected to the lifting carriage and driven by the winch, said second cable being selectively engageable with the means for selectively engaging the counterbalancing carriage with the drive means whereby the counterbalancing carriage is moved when sadi second cable is thus engaged.

6. A crane according to claim **1** wherein the drive means comprises a winch, a pair of cables connected to the lifting carriage and driven by the winch, a third cable connected to the counterbalancing carriage and selectively engageable with the means for selectively engaging the counterbalancing carriage with the drive means whereby the counterbalancing carriage is moved when said third cable is thus engaged.

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