

Aug. 9, 1966

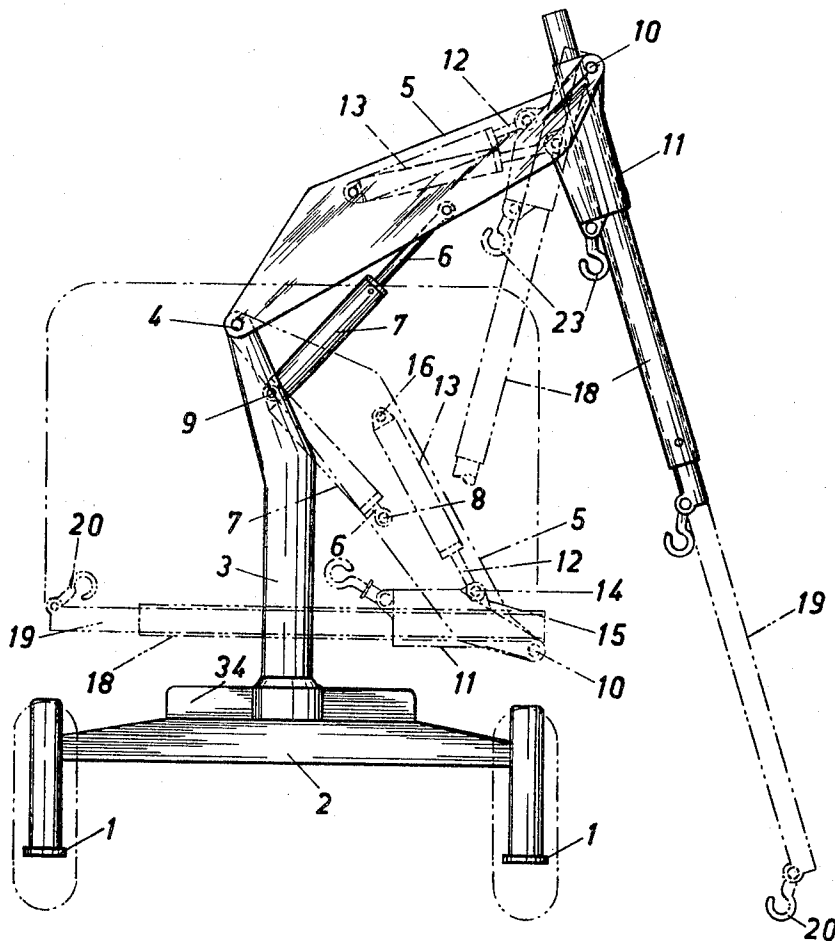
A. E. SUNDIN
CRANE WITH FOLDING BOOM WHICH PASSES CLOSE
TO BUT CLEARS ITS MAST

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Filed Oct. 27, 1964

2 Sheets-Sheet 1

Fig. 1



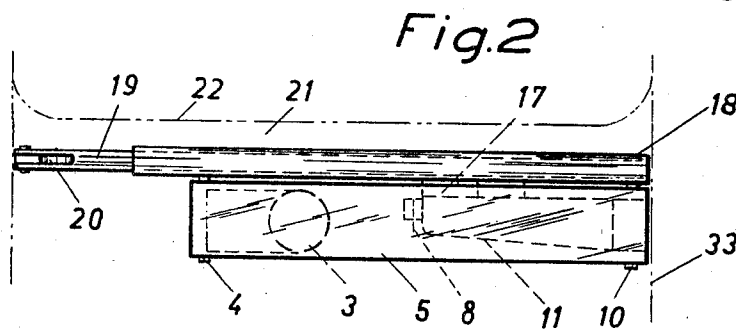
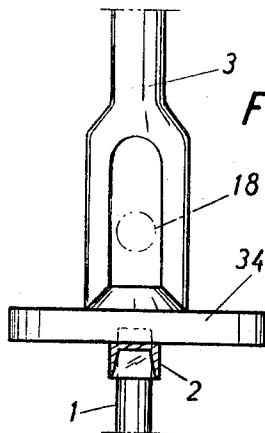
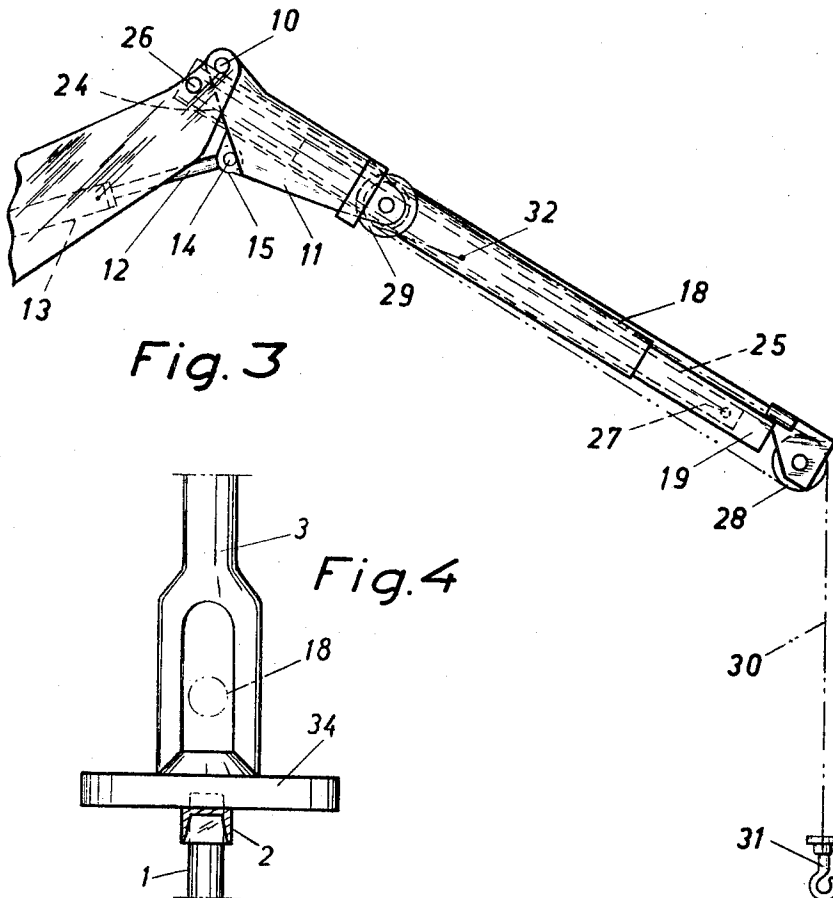
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2 Sheets-Sheet 2



1

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CRANE WITH FOLDING BOOM WHICH PASSES CLOSE TO BUT CLEARS ITS MAST

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6 Claims. (Cl. 212—35)

For loading apparatuses in the form of cranes to be mounted on lorries it is of utmost importance that the crane in question is as light as possible and that it occupies a little place on the vehicle. By providing the cranes with a rocker arm on their loading boom it has been possible to obtain a rather simple construction giving possibilities to vary the distance between the suspension point of the load and the centre of rotation of the crane. The rocker arm has made it possible also to fold the crane to a rather compact unit during driving with the vehicle. This folding of the rocker arm has in previous constructions been performed either manually or by providing the joint between the hoisting boom and the rocker arm with a gear wheel, a fork bearing or the like in such a way that the rocker arm be foldable to a position on the hoisting boom. Last mentioned construction has, however, required an extra step at the folding of the crane to the transportation position. The rocker arm is as a rule provided with a tube extension arm which is to be projected manually or hydraulically so as to obtain a sufficient reach of the crane. However, it has turned out that the projection of the extension arm has been rather restricted as it has suffered from a tendency to project above the point of the crane otherwise being the highest point of the crane in the transportation position.

Cranes are also known in which the rocker arm in the transportation position can be folded downwards and in which the rocker arm is so short that it can be housed in the space between the crane post and the outer end of the hoisting arm in the transportation position, i.e. in a loading apparatus which is mounted in the longitudinal axis of the vehicle, the elongation arm should be somewhat shorter than half the width of the car. Of course, it is hereby obtained a simple folding of the crane to the transportation position but the loading apparatus will have a very short reach.

The present invention has reference to an improved loading apparatus of the recited type, thus being provided with a hoisting boom that can be swung in relation to the stand of the apparatus in a vertical plane, said boom having at its outer end a vertically swingable rocker arm and an elongation arm extending in the longitudinal direction of the same. The main feature of the invention is to be seen therein that the elongation arm at the folding of the hoisting arm and the swinging in of the rocker arm passes, below the same, on one side of the stand.

Thus, the rocker arm comprises a rather short portion carried centrally in the hoisting boom and being attached to the other side of the same. The elongation arm extending parallelly to the rocker arm is situated so far from the longitudinal axis of the same that the rocker arm can pass on one side of the stand of the loading apparatus. This means that the elongation arm can be made rather long and consequently the crane will have a considerable reach.

According to a preferred embodiment of the invention, there is in the elongation arm arranged a telescope boom which can be made almost as long as the width of the lorry. This makes the reach of the crane considerable.

In the following the invention will be elucidated with reference to the accompanying drawings. In the drawings:

FIG. 1 is a rear view of a loading apparatus according to the invention with the lorry carrying the loading apparatus indicated with dash and dot lines,

2

FIG. 2 is, on a somewhat larger scale, a plan view of the same in the transportation position,

FIG. 3 is a side elevation of the outer end of the hoisting boom with the rocker arm and the elongation arm according to another embodiment of the invention, and

FIG. 4 is an elevation view of the post and adjacent construction in a further embodiment of the invention.

A post 3 is vertically swingable on a frame 2 with abutment legs 1 which can be lowered. A hoisting boom 5 is journaled about a horizontal shaft 4 at the upper end of said post 3, said boom 5 being by means of an hydraulic piston and cylinder unit 6, 7 pivoted on the hoisting boom as at 8 and with the post as at 9. At the outer end of the hoisting boom which is shaped as a fork, there is about a horizontal shaft 10 journaled a rocker arm 11. The latter is swingable by means of an hydraulic piston and cylinder unit 12, 13 which at 14 is journaled to an ear 15 on the rocker arm 11 and at 16 journaled to the hoisting boom 5. The rocker arm 11 is on one side provided with an extension 17 to which there is attached, preferably by means of welding, a guide tube 18 extending parallelly to the rocker arm and serving as an elongation arm, said guide tube 18 guiding a telescope boom 19 being axially movable in the interior of said tube and being at its outer end provided with a lifting hook 20. In projected position (see FIG. 1, the dash and dot lines at the lower right hand portion of this figure) the telescope boom 19 is retained by means of a pin extending through the same and the outer end of the guide tube 18. The guide tube 18 which extends parallelly to the rocker arm 11 extends on one side of the same so far from it that the guide tube with the telescope boom 19 when the crane is folded (see FIGS. 1 and 2) extends on one side of (in the front of) the post 3 and will be situated in the space 21 between the post and the driver's cabin of the lorry. In folded position none of the portions of the cranes extends outside the driver's cabin 22, neither upwards nor sideways.

As shown in FIG. 1 also the rocker arm 11 may be provided with a lifting hook 23 for heavy loads.

When the crane is completely unfolded there is obtained a considerable reach as shown in FIG. 1.

According to the embodiment shown in FIG. 3 the telescope boom 19 is movable in the guide means 18 by means of an hydraulic piston and cylinder unit 24, 25 having one end, by means of a bolt 26, connected to the farthest end of the guide tube 18 and by means of a bolt 27 to the foremost end of the telescope boom 19. The same is also provided with a number of pulleys 28 and the rocker arm 11 is at its foremost end provided with a corresponding number of pulleys 29. A rope 30 is laid over the pulleys, said rope being at one end provided with a lift hook 31 and at the opposite end as at 32 attached to the guide tube 18. Such a device can be used to tow e.g. timber from places at great distances from the lorry for loading the timber on the wagon-bridge 33. When the telescope boom 19 is completely retracted, the rope 30 has a considerable free length. When the telescope boom 19 thereupon is moved outwards by means of the piston cylinder unit 24, 25, the rope 30 is automatically wound up with the load on the hook 31. When the load arrives to the lorry, it is hoisted by a swinging upwards of the hoisting boom 5 and the rocker arm 11 by means of their piston-cylinder units 6, 7 and 12, 13, respectively, whereupon the load by the swinging of the post 3 by means of the turning aggregate 34 (FIG. 1) is swung in over the flat bed 35 of the lorry and is lowered down on the same.

As shown and described embodiments are to be regarded as examples only and the different details of the loading apparatus may be constructively modified in many ways within the scope of the appended claims. A similar effect as the one described in the foregoing could be obtained by means of the elongation arm being arranged

3

coaxially with the rocker arm in case the post of the crane is swung in such a way that the elongation arm can be housed in front of the post when the crane is folded. Within the scope of the invention also such an embodiment is possible in which the crane post 3 is shaped with a central aperture or a channel into which the elongation arm 18 can be swung when the crane is folded to the transportation position (FIG. 4).

What I claim is:

1. In a crane adapted to be mounted on a truck, an upright post, a hoisting boom pivotally mounted on said post on a horizontal pivotal axis, a rocker arm pivotally mounted on said hoisting boom on a horizontal pivotal axis, a longitudinally extensible elongation arm and means mounting said elongation arm on said rocker arm for extension of said elongation arm in the longitudinal direction of said rocker arm, said means comprising a support extending laterally from said rocker arm to said elongation arm to laterally displace said elongation arm from alignment with said post, whereby when said hoisting boom and said rocker arm are swung inward toward said post said elongation arm passes on one side of said post.

2. In a crane according to claim 1, in which said longitudinally extensible elongation arm comprises a guide tube, said guide tube supporting and slidably guiding a telescope boom and said support laterally extending to said guide tube.

3. In a crane according to claim 1, in which a first pulley is mounted on the outer end of said rocker arm, a second pulley is mounted on the outer end of said telescope boom and a rope runs over said pulleys, one end of said rope being attached to said rocker arm and the other end of said rope carrying a hook.

4. In a crane adapted to be mounted on a truck, an upright post, a hoisting boom pivotally mounted on said

4

post on a horizontal pivotal axis, a rocker arm pivotally mounted on said hoisting boom on a horizontal pivotal axis and a longitudinally extensible elongation arm, said post being provided with an aperture adapted to permit passage through of said elongation arm, whereby when said hoisting boom and said rocker arm are swung inward toward said post said elongation arm passes through said aperture.

5. In a crane according to claim 4, in which said longitudinally extensible elongation arm comprises a guide tube, said guide tube supporting and slidably guiding a telescope boom and said support laterally extending to said guide tube.

6. In a crane according to claim 4, in which a first pulley is mounted on the outer end of said rocker arm, a second pulley is mounted on the outer end of said telescope boom and a rope runs over said pulleys, one end of said rope being attached to said rocker arm and the other end of said rope carrying a hook.

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