

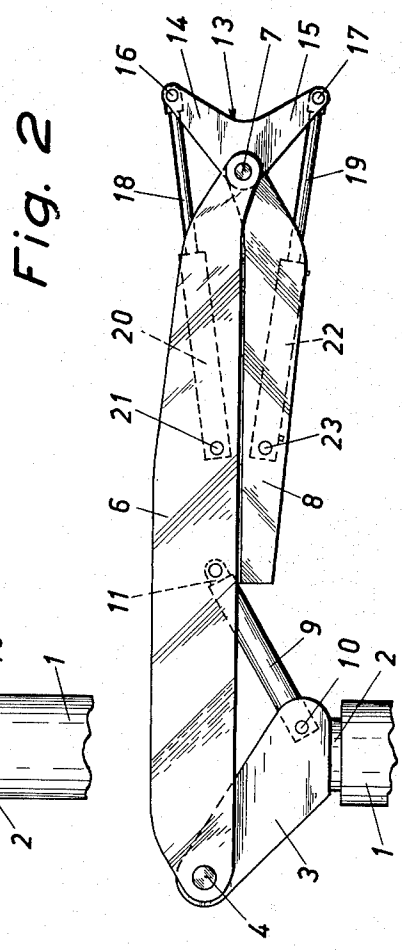
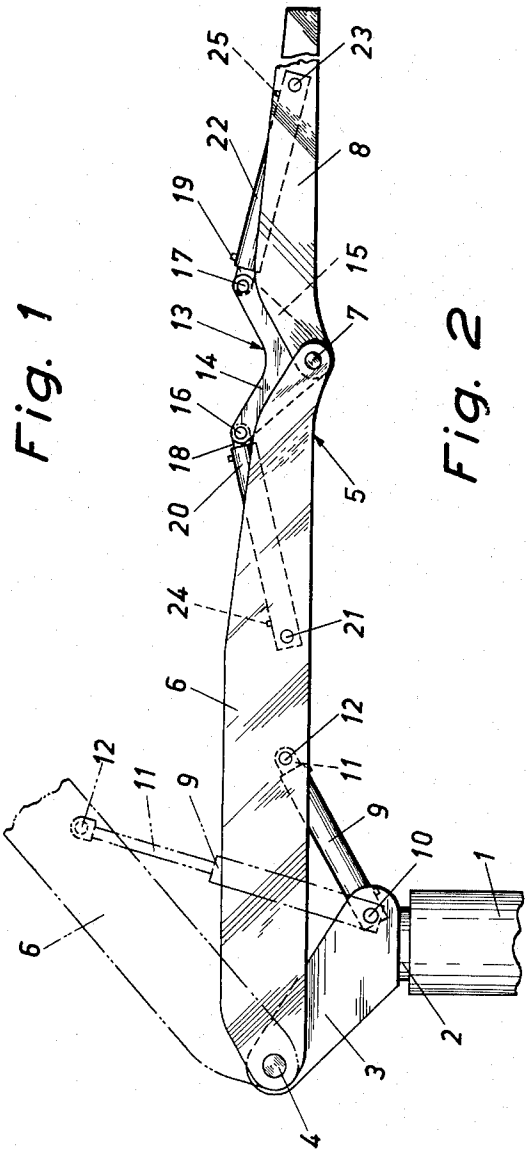
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LIFTING ARM IN LOADING APPARATUS

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INVENTOR.

BY 
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LIFTING ARM IN LOADING APPARATUS

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This invention has reference to an improvement in loading apparatus and more particularly a boom arrangement intended to be used on a lorry or truck and provided with a folding boom rotational vertically as well as horizontally relatively to the body of the apparatus, the movement in vertical direction at least partly obtained by means of an hydraulic piston and cylinder. The lifting or folding boom comprises an inner arm portion situated adjacent the body of the apparatus and an outer arm portion journaled to said inner arm portion and operated by means of an hydraulic device such that the free end of said outer arm portion can be not only swung horizontally and vertically but also be displaced in the direction to and from said body.

The main feature of the invention is to be seen therein that on a pivot shaft by means of which the outer arm portion is journaled to the inner arm portion there is journaled the center arm portion of a two-armed lever the arms of which are each journaled to a respective hydraulic piston and cylinder. The pistons and cylinders are journaled to the inner lifting arm portion and the outer lifting arm portion, respectively.

A great advantage of this device is that the outer lifting arm portion can be easily swung in below the inner lifting arm portion so that the boom assumes a folded position and requires very little space in this folded position. This is of importance when the lorry or truck is driven on a public road from one place to another. Another advantage in the device is that the free end of the outer lifting arm portion, with its free end carrying a lifting tool, can have a considerable movement in height in the vertical plane while maintaining a large moment of rotation.

An example of a device in accordance with the invention will now be described with reference to the accompanying, partly diagrammatic drawings in which:

FIG. 1 is a side elevation view of a loading apparatus or foldable boom according to the invention with the outer lifting arm portion in an unfolded position, and

FIG. 2 is a corresponding side elevation with the outer lifting arm portion in a folded position under the inner lifting arm portion.

The loading apparatus of which only the upper portion is shown is assumed to be arranged on the chassis frame of a truck and disposed just behind the driver's compartment, not shown. A carrying bushing 2 in the body 1 carries rotationally a head 3. The upper end of the head 3 is provided with a horizontal shaft 4 about which a lifting arm 5 of the apparatus is journaled. The lifting arm 5 comprises an inner or first boom portion 6 situated adjacent the body 1 and an outer or second arm 8 journaled to said inner arm 6 by means of a horizontal shaft 7. With one end about a shaft trunnion 10 an hydraulic cylinder 9 is journaled to the inner head 3. The piston 11 is axially slideable in the cylinder 9. The piston 11 is pivotally connected to the arm 6 by means of a shaft trunnion 12.

A two-armed lever 13 of angular shape is journaled about the pivot shaft 7 and the obliquely upwards di-

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rected arms 14, 15 of said lever 13 are with their free ends by means of each of their shaft trunnions 16, 17, respectively, journaled to the free end of a piston 18 respectively 19. The piston 18 is axially moveable in an hydraulic cylinder 20 which with one end is journaled about a shaft trunnion 21 and connected to the inner arm. The piston 19 is axially moveable in an hydraulic cylinder 22, the latter being with one end about a shaft trunnion journaled to the outer lifting arm 8.

When liquid is applied under pressure at 24 and 25 the cylinder, the pistons or rams 18, 19 are pressed out of their respective cylinder and the lifting arm 8 is swung in a clockwise direction according to the drawing. This rotation continues until the position, shown in FIG. 2, i.e. the transport position, is assumed when the lifting arm 8 is completely swung in under the lifting arm 6 and the boom assumes a folded position. During this rotation also the lever 13 is swung in a clockwise direction about the pivot shaft 7. As obvious from the drawing the rotation moment exerted by the pistons 18 and 19 on the lever 13 will be considerable as the lever to the pivot shaft 7 always remains long. Those skilled in the art understand that when fluid under pressure is applied to the ends of the cylinders other than the end having the connections 24, 25 just described the boom can be made to assume the extended condition shown in FIG. 1.

It is preferable to shape the ends of the lifting arms 6, 8 turned towards each other as forks and the lever 13 is journaled on the pivot shaft 7 in the space between the fork branches. However, it is also possible to attach a lever to one end of the pivot shaft 7 corresponding to the arm 14 and the free end is by means of a pivot trunnion 16 journaled to the outer end of the piston 18 and on the opposite end of the pivot shaft 7 carries a similar lever corresponding to the arm 15, and the free end of said lever is, by means of a trunnion 17, journaled about the outer end of the piston 19.

The present invention has been described in detail above for purposes of illustration only and is not intended to be limited by this description or otherwise except as defined in the appended claims. The hydraulic device with its pump, conduits and valves has been omitted from the drawing so as not to make this too complicated. These details are not necessary for the elucidation.

What I claim is:

1. A folding boom arrangement for trucks and the like comprising, a folding boom having a pivotally mounted first arm upon an upright support and having a free end, a hydraulically operated ram connected to said arm to operate it to a substantially horizontal position and to an elevated position, a second arm having an end pivotally connected to said free end of said first arm, a two-arm lever pivotally mounted for movement relative to said first and second arms, means mounting said second arm and said lever for pivotal rotation about a common axis, a pair of hydraulically operated rams connected to said first and second arms respectively and to said lever at spaced points for operating said first and second arms to a first position in which said second arm is disposed as a longitudinal extension of said first arm, and for operating said second arm to a second position in which said arms are both disposed extending in a common direction away from said common axis and said second arm assumes a position below said first arm folded back along said first arm.

2. A folding boom arrangement according to claim 1, in which said pair of rams comprise pistons each having an end pivotally connected to a respective arm, and in which said pair of rams are fixed respectively relative to said first arm and said second arm.

3. A folding boom arrangement according to claim 1, including means pivotally mounting said first arm relative to a vertical pivotal axis defined by said upright support.

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References Cited by the Examiner**UNITED STATES PATENTS**

2,788,906	4/1957	Davis et al.	214—138
3,154,199	10/1964	Balogh et al.	212—144 X

FOREIGN PATENTS

660,906	4/1963	Canada.
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