July 7, 1953 H. KAMPLADE 2,644,339

LIFTING DEVICE FOR THE TOOL-CARRIER OF AGRICULTURAL MACHINES

Filed April 17, 1952

Fig. 1

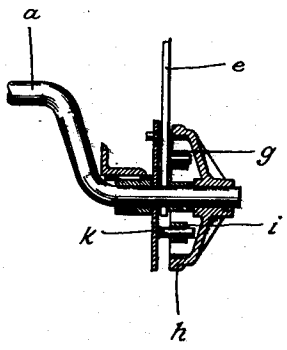


Fig. 2

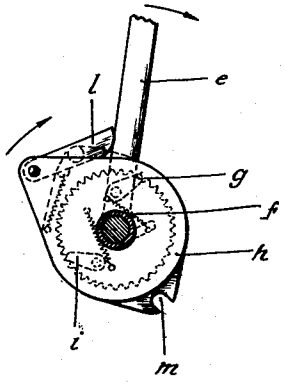
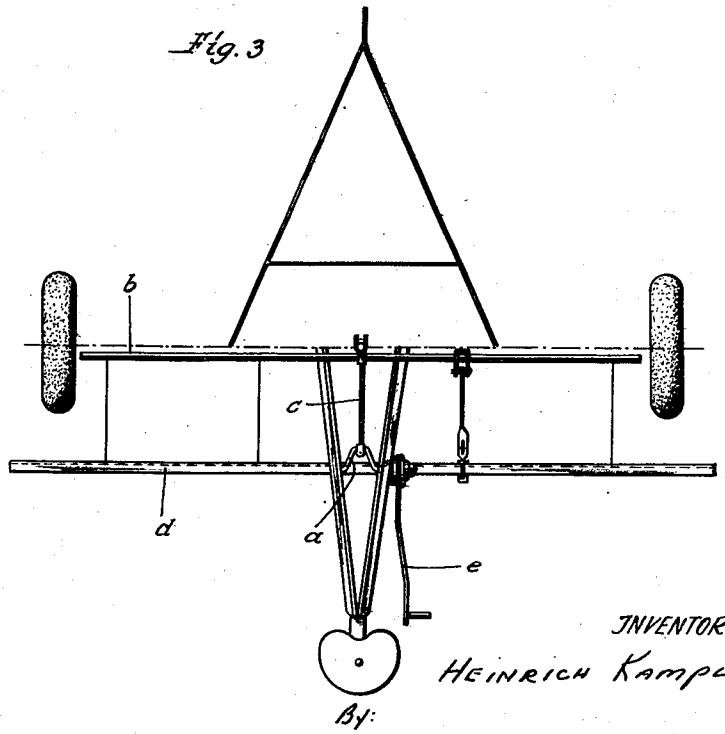


Fig. 3



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LIFTING DEVICE FOR THE TOOL-CARRIER OF AGRICULTURAL MACHINES

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1 Claim. (Cl. 74—155)

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The invention relates to a lifting device, operable from the driver's seat, for the frames of agricultural machines whose working tools can be manually engaged and disengaged during operation. In hitherto-known machines such as hoeing machines in which the frame complete with hoes is very heavy, engagement and disengagement from the driver's seat has been extremely difficult. There has also been a need for means to increase the load, even during operation, without having to release a detent on the hand lever.

The lifting device pursuant to the invention eliminates these disadvantages. The lifting is effected by a cranked shaft actuated by the manual lever at the driver's seat by means of an automatically acting ratchet and lifter combination, where such cranked shaft may alternatively be replaced by a unilaterally supported crank.

The essence of the invention consists in that this manually operated lift and ratchet combination acts entirely automatically; the method of the invention is characterized in that a cranked shaft bears a rotatably mounted hand lever provided with a spring pawl that, in known manner, engages the teeth of a ratchet whose reverse rotation is prevented by another spring pawl mounted on the frame and dropping into diagonally opposed recesses, of otherwise known kind, in the ratchet. As the hand lever rotates the ratchet, and hence the crank, through 180° at a time, the machine is engaged or disengaged; with each rotation of the ratchet and crank through this angle, the pawl mounted outside the ratchet in the sector of movement of the hand lever drops into one of the diagonally opposed recesses in the ratchet wheel, such recess being so placed relative to the crank that in the positions determined by the pawl, the disengaged traveling position of the frame or its engaged working position, as the case may be, is automatically set.

This lifting device is illustrated in the drawing, where Figure 1 shows a sectional view of the actual device, Figure 2 shows a side view of the same, and Figure 3 shows the installation of the device in a hoeing machine.

The disengaging action is transmitted by crankshaft *a* to lift shaft *b* mounted on the frame of the machine, by means of a rod *c*. From the lift shaft is suspended the hoe frame *d*, whose tools are to be disengaged and re-engaged at the end of each row. This lifting action is effected from the driver's seat by means of a hand lever rotatably mounted on the crankshaft *a*.

On the hand lever, and acted upon by a spring *f*, there is a pawl *g* engaging a ratchet *h*. The ratchet wheel *h* is fixed to the crankshaft *a*, and its reverse motion is prevented by another spring-action pawl *i*, located opposite to the pawl *g* and

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acting in the opposite direction, mounted on a projection of the crankshaft bearing *k*. Thus the hand lever *e* will turn the ratchet *h*, and with it the crankshaft *a*, only in the direction indicated by the arrow, while the motion required for the lifting action can be effected simply by means of the hand lever *e*, and with more or less angular deflection as desired. The operator can thus select the stroke of the hand lever at will, and thereby obtain the most favorable position for the application of force.

On the crankshaft bearing *k*, outside of the ratchet *h*, there is mounted an additional spring-action pawl *l*, having a projection that will drop into diagonally opposed recesses *m* on the periphery of the ratchet; these recesses have the function of determining the initial and final positions of the lifting action. This pawl *l* is located in the sector of movement of the hand lever *e*, and has a curved surface in the nature of a cam track on the side towards the lever. If the projection of the pawl is in one of the recesses *m*, and if the lever is struck against the cam track of the said pawl, the latter is rotated and thereby disengaged so that, by a sufficiently sharp kick of the internal pawl *g*, the ratchet is released and a second disengagement can be initiated.

With this design it is therefore possible to use the hand lever *e* at the driver's seat to engage and disengage the machine automatically without any additional manual operation, and also to effect a gradual engagement of the frame up to full entry of the tools, i. e. up to the preestablished final position.

I claim:

A lifting device for the frames of horse-drawn or tractor-drawn agricultural machines having manually engageable and disengageable working tools, said device comprising a cranked shaft, a ratchet having a single series of teeth connected to the shaft, a manual lever rotatably mounted on the cranked shaft, a first spring biased pawl connected to the lever and engaging the teeth of the ratchet, a second spring biased pawl mounted on the frame in a position to prevent reverse motion of the ratchet, and a third spring biased pawl mounted on the frame outside of the ratchet within the sector of movement of the lever and engageable with two recesses located at diagonally opposite points on the ratchet.

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