Nov. 20, 1956 A. S. RYMKEVITCH 2,770,895

COMBINED CRANE AND BULLDOZER

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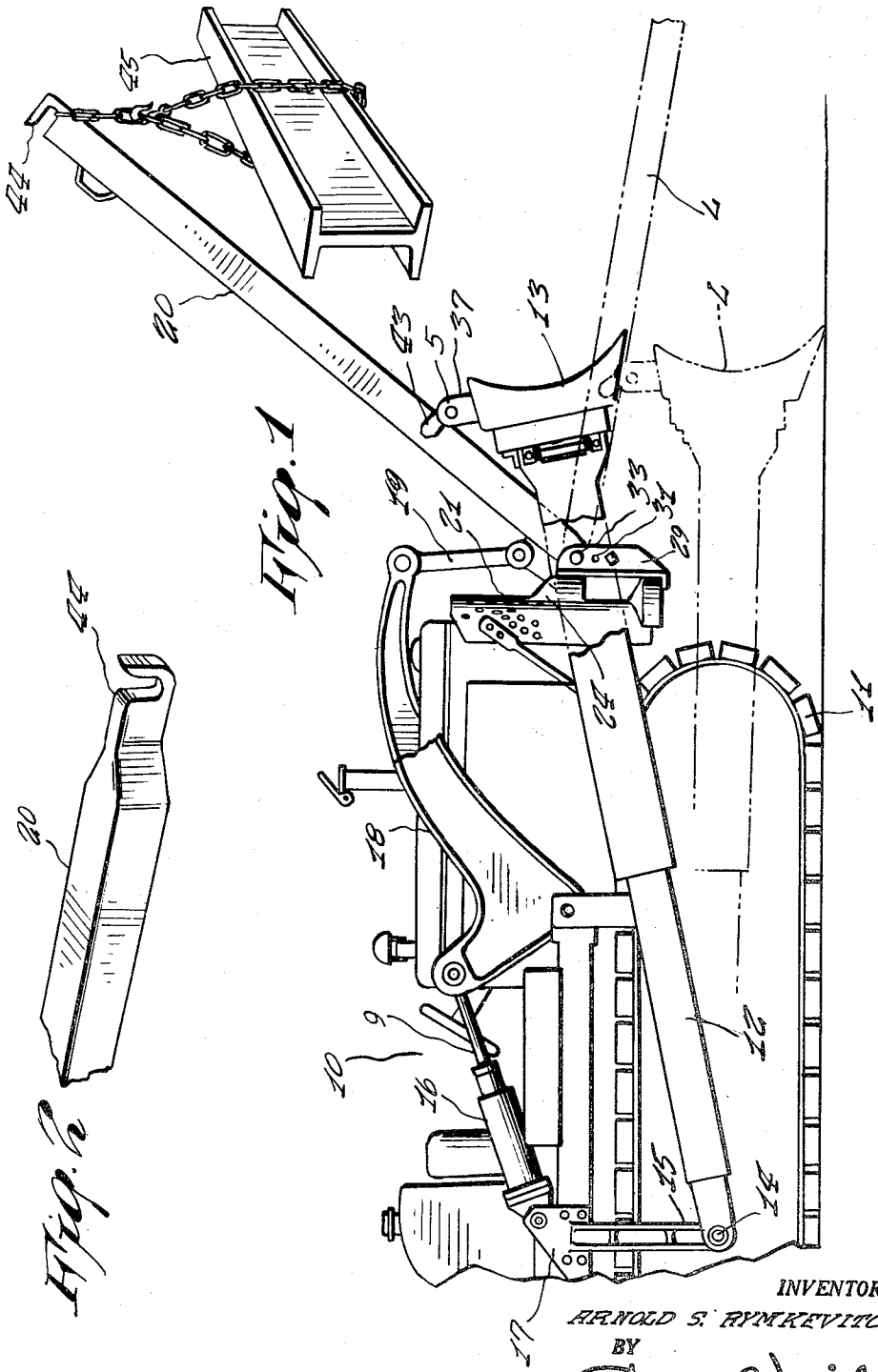


Fig. 1



Fig. 2

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Fig 3

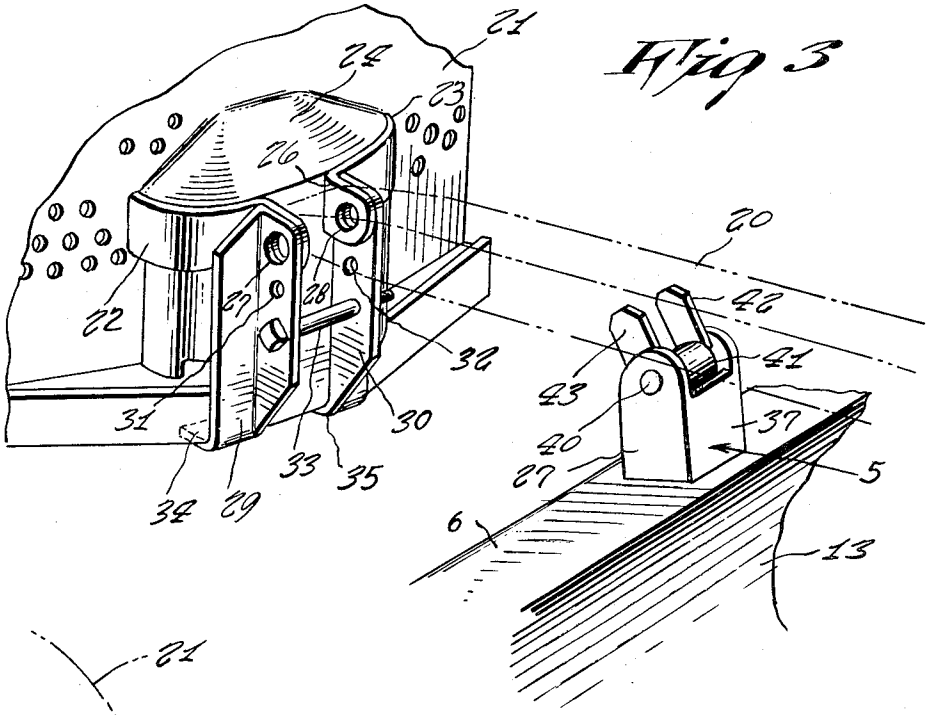



Fig. 4

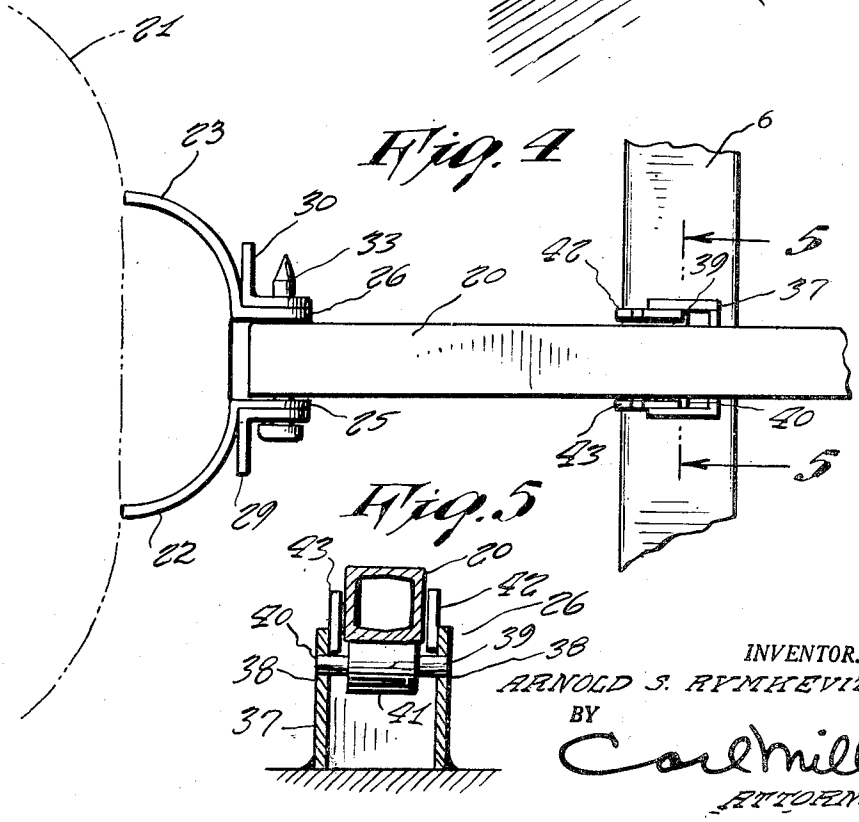



Fig. 5




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United States Patent Office 2,770,895 Patented Nov. 20, 1956



2,770,895

# COMBINED CRANE AND BULLDOZER

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Application December 9, 1954, Serial No. 474,192

3 Claims. (Cl. 37—117.5)

This invention relates to bulldozers equipped to function dually as a crane.

Frequently in construction operations involving bulldozers, heavy cumbersome objects such as tree stumps, beams, tanks, etc. are encountered, requiring the services of a crane. To involve an additional piece of heavy machinery, such as a crane, introduces large additional expenses, in addition to the loss of time required to maneuver the crane into operating position. Consequently, the great utility of a bulldozer which can rapidly be converted into a crane is apparent.

Although the prior art reveals devices combining the crane and bulldozer functions, these devices are quite complex, involving additional powering mechanisms to produce the desired result. Moreover, due to the complexity of the crane attachments, a great deal of time is consumed in making the modification, or the function of the bulldozer is hampered by the crane being in operative position.

Consequently, the primary inventive object is to provide a bulldozer with a crane boom that can be rapidly attached in operative position in such a manner whereby the boom is operated by the bulldozer controls without involving additional power connections to the boom.

A further inventive object involves the provision of a detachable crane boom for a conventional bulldozer, whereby one end of the boom is pivoted to the bulldozer chassis, and the bulldozer blade arm supports the boom intermediate its ends.

Further objects and inventive details will become apparent from the following description, when taken in connection with the attached drawings, in which:

Figure 1 is a side elevation of the combined bulldozer and crane, showing the crane boom in operative position.

Figure 2 is a perspective view of the hook end of the crane boom.

Figure 3 is a perspective view of the pivot connection between the bulldozer chassis and the boom, and also the roller guide on the bulldozer blade.

Figure 4 is a plan view of the parts shown in Figure 3.

Figure 5 is a section through 5—5 of Figure 4.

Referring to Figure 1, the conventional bulldozer **10** is seen comprising the treads **11**, the extensible blade frame **12** carrying the blade **13**, said frame **12** being pivoted at **14** to the bracket **15**. An hydraulic power cylinder **16** is affixed to the bracket **17**, the power piston **9** being pivotally connected to the bell crank **18**, which through the link **19** causes the frame **12** to rotate about the pivot **14**; the foregoing structure all being conventional. The novelty involved herein is achieved by pivotally securing the boom **20** to the radiator guard **21** and providing an intermediate boom support **5** projecting from the top of the blade **13**.

The details of these novel modifications can be better understood from Figure 3, wherein the steel band straps **22** and **23** are welded to the protruding protective abutment **24**. Straps **22** and **23** are provided with parallel



forward extending ears **25** and **26** having the concentric holes **27** and **28**. To the outer faces of the ears are welded the vertical angles **29** and **30** whose formally extending legs abut the ears **25** and **26** and include holes in alignment with the holes **27** and **28**. Additional perforations **31** and **32** are provided for the purposes of carrying the pivot bolt **33** when the boom is not in use. The bottom portions **34** and **35** of the outstanding angle legs are similarly secured to the underside of the radiator guard, providing a sturdy connection between the radiator guard and the angles.

Referring again to Figure 4, it is seen that the boom support **5** is secured to the top surface **6** of the blade **13**. In Figure 5, the boom support **5** is seen to comprise the bracket **37** having the aligned holes **38** for the reception of the pins **39** and **40** which extend from the roller **41** which supports the boom **20**. For boom guiding purposes, the plates **42** and **43** are secured to the sides of the bracket **37**.

The boom **20** is placed in operative position by aligning the holes through the rear end of the boom with the holes **27** and **28**, and then inserting the pin or bolt **33** (see Figure 4). The body of the boom is inserted between the plates **42**, **43** to bear on the roller **41**.

In operation, starting from the lower blade position "L" of Figure 1, by actuating the power cylinder **16** the frame **12** is caused to move upwardly pivoting about **14**, thereby causing the boom support **5** to force the boom **20** upwardly. Thus, boom **20** pivots about the pin **33** while the hook end **44** moves upwardly carrying with it any desired load, such as the I-beam **45**. Due to the roller **41**, there is little wear or tear involved due to the relative movement between the boom and the boom support.

It is to be further noted that no new power connection from the operator to the boom is required. The power transmitted to the blade is utilized to operate the boom. When not in operative position, the boom is carried along the bulldozer side in a manner which does not interfere with the bulldozing operations.

Due to the simplicity of the adaptation only three and one-half minutes are required to convert the bulldozer into a crane. When translated into money and time saved, one can well appreciate the utility herein involved.

It should further be understood that the various species resulting from different arrangements of the combinative elements or from changes in size, shape or material, are all within the inventive scope.

Having thus described the nature of the invention, what is claimed as new is as follows:

1. A bulldozer comprising a tractor and an earth moving blade attached to the forward extremity of a pair of longitudinally extending push arms, the rearward extremity of each said push arms being pivoted to said tractor, the portion intermediate the forward and rearward extremities of said push arms being connected to a power actuating mechanism, a boom, a bracket comprising an arcuate portion secured to the front end of said tractor having a pair of fixed longitudinally extending ears, one end of said boom being pivotally connected between said ears for fixed pivotal movement relative to said tractor, a support affixed to an upper surface of said blade comprising a guide bracket having a pair of spaced legs and a roller rotatably supported therebetween, said roller being adapted to support said boom in longitudinal rolling engagement thereon intermediate the longitudinal extremities of said boom, said arcuate bracket further comprising reinforcing struts secured to said ears and extending below said arcuate portion into securing engagement with said tractor at a point beneath said arcuate portion.

2. A bulldozer, as in claim 1, wherein the arcuate por-

tion of said arcuate tractor bracket is connected to the radiator guard of said tractor.

3. A bulldozer, as in claim 2, wherein said boom rests upon said roller and loosely fits between the said spaced parallel legs, said legs extending above the bottom edge of the boom for guiding purposes.



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