May 26, 1970 C. W. STONE 3,513,998

LOGGER

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Fig. 1.

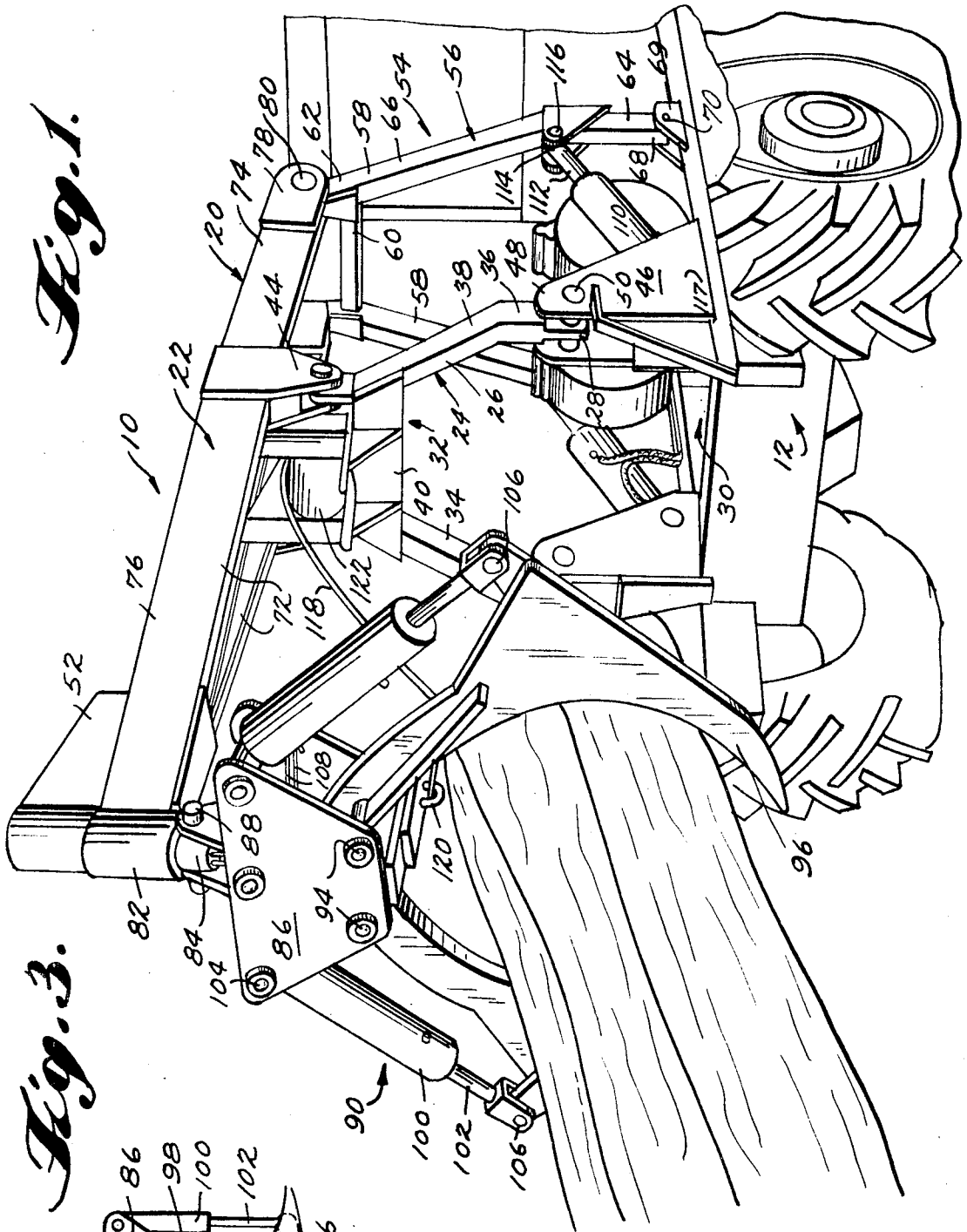
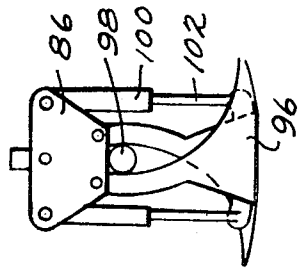


Fig. 3.



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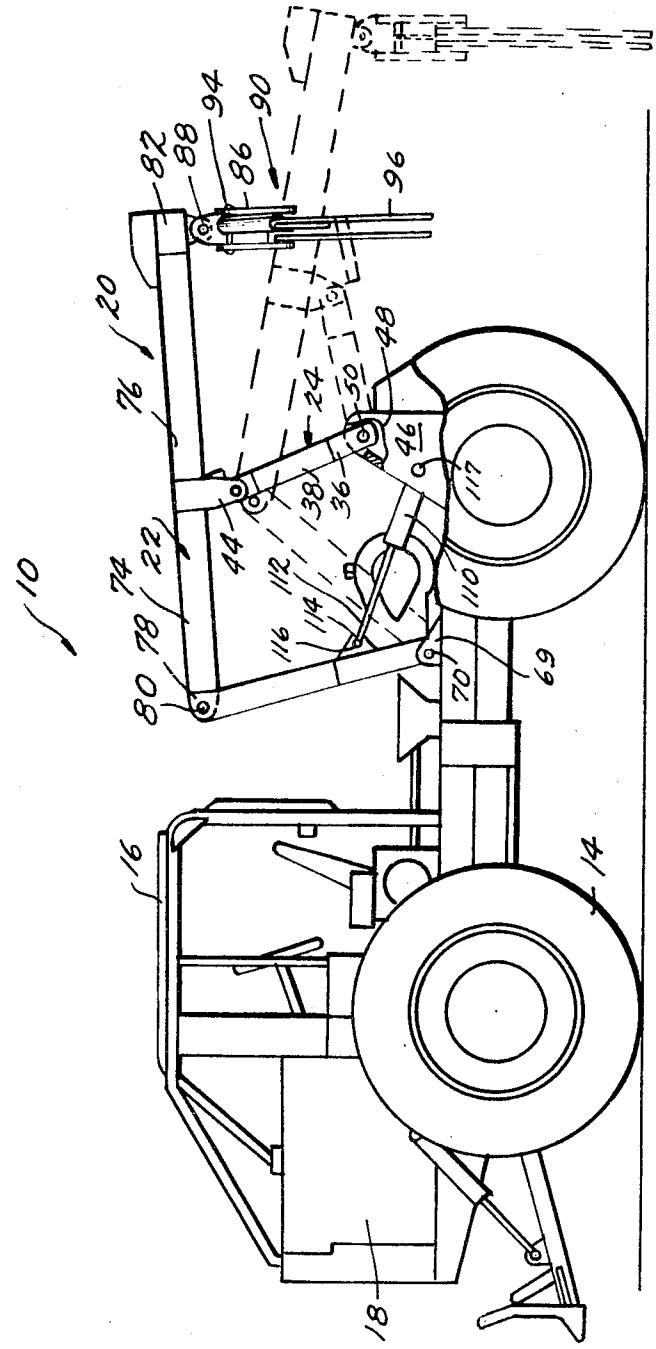


Fig. 2.

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LOGGER

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Int. Cl. B66c 1/30
U.S. Cl. 214—147 14 Claims

ABSTRACT OF THE DISCLOSURE

A logger having a vehicle body and a boom pivotally mounted on the vehicle body by a pair of rigid, unextendible support means with piston and cylinder means for pivoting the forward support means and hence the boom and including a grapple secured to the rear end of the boom and rotatable about a vertical axis and pivotal about a horizontal axis.

BACKGROUND OF THE INVENTION

This invention relates to a loading device and more particularly to a logger.

There are various types of lifting devices in the prior art for logs and the like. These devices are designed to completely lift a load off the ground and support it in air. As a result, these lifting devices are quite complicated and for the purpose of maintaining balance of the vehicle during lifting, a boom is generally pivotally mounted on one end of the vehicle and extends the length of and above the vehicle with the other end having a grapple means or the like thereon. Elaborate cylinders and pistons of considerable length are provided to obtain the necessary lift once the log has been engaged by the grapple. Such loading devices often are difficult to manipulate in crowded surroundings.

SUMMARY OF INVENTION

The present invention is not a lifting device. Rather, it is intended to be a convenient, easily manipulated, versatile device for engaging and lifting one end of a log whereby the log can be dragged to a designated place. Simplicity and the compactness of operation are essential in a logger. Moreover, it is desirable to have a boom and grapple means which can reach to the ground, and engage and pick up the logs regardless of the alignment of the logs with respect to the back of the vehicle. These desired features are achieved through the present invention. Other specific objects of the invention will become readily apparent in the detailed description of the construction of this logger and in the claims appended hereto.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a fragmentary, perspective view of the logger with some parts broken away for clarity;

FIG. 2 is a side elevational view of the logger; and

FIG. 3 is an end view of the grapple means engaging a relatively small log and showing the grapple times in overlapping relationship.

DESCRIPTION OF THE PREFERRED EMBODIMENT

As shown in FIGS. 1 and 2, the logger **10** comprises a vehicle body **12** mounted on wheels **14** (although an endless track could be used just as easily) with a cab **16** and engine **18** mounted on the front portion thereof and a logging device **20** mounted on the rear portion thereof.

The logging device **20** includes a boom **22** which is adapted to move rearwardly and downwardly as shown in dotted lines in FIGURE 2 and forwardly and upwardly as shown in solid lines in FIG. 2. This movement of the boom enables one end of logs lying on the ground to be grappled, lifted up, and moved into a hauling position wherein the other end of the logs is resting on the ground.

The boom **22** is supoprted above the vehicle body by a pair of support means. One support means is described as a first rear support means **24** and includes a rigid, non-extendible inverted U-shaped member or yoke member **26**, the free ends **28** of the legs **34** of which are operatively and pivotally mounted to the vehicle body adjacent its rear end **30** and the intermediate portion or apex **32** of the yoke member being operatively and pivotally mounted to the boom **22**.

In the embodiment of the invention disclosed herein, the first yoke member comprises a pair of legs **34** which include substantially parallel bottom portions **36** and converging upper portions **38**. The upper portions converge and engage a crossbar **40** at their upper ends. The crossbar **40** has a pair of upwardly extending lugs **42** which are pivotally mounted in a pair of non-movable jaws **44** extending downwardly from the boom.

The vehicle body **12**, adjacent its rear end **30**, has a pair of transversely spaced, upwardly extending rear brackets **46** rigidly mounted thereon. The upper ends **48** of the brackets receive the lower portions of the legs **34** of the rear yoke member **26** and pivotally support the yoke member on pins **50** defining a horizontal axis transverse to the vehicle body. The rear yoke member **26** thus pivots in a plane aligned with the longitudinal axis of the vehicle body.

The other support means is described as the second forward support means **54** and has a somewhat similar construction to the rear support member. This forward support means **54** includes a forward inverted U-shaped or yoke member **56** having a pair of legs **58** and a crossbrace **60** joining the legs adjacent their upper ends **62**. The legs have substantially parallel bottom portions **64** and converging top portions **66** which engage the crossbrace **60** adjacent their upper ends **62**. The free ends **68** of the lower portions of the legs are pivotally mounted in forward brackets **69** by means of pins **70** defining a horizontal axis transverse to the vehicle body. It will be seen that the horizontal axis of the pivotal connection of the rear support member is spaced from, or disposed upwardly with respect to, the axis of pivotal connection of the forward support member.

The boom **22** comprises an approximate A-frame including two legs **72** having forward, substantially parallel portions **74** and converging rear portions **76**. The forward ends **78** of the legs of the boom are pivotally connected to the upper ends **62** of the legs **58** of the forward yoke member **56** as at **80**.

Because the boom, by means of downwardly extending jaws **44**, engages the upwardly extending lugs **42** of the rear support member, it will be seen that the horizontal axis of the upper pivotal connection of the rear support member and the boom is spaced from, or downwardly disposed with respect to, the axis of the pivotal connection between the boom and the forward support member.

The rear portions **76** of the boom legs **72** terminate in and are connected to a hollow boss **82**. A hollow stud **84** is rotatably mounted in the boss **82** and operatively carried thereby. The stud extends downwardly from the boss and pivotally carries the grapple frame means **86**.

This frame means is mounted on a pin **88** extending through the stud **84** which defines a horizontal axis. The frame means **86** carries a grapple means **90** which, for illustration, comprises arcuate tongs **92** pivotally mounted about horizontal axes **94** in the frame means. The arcuate tines or arms **96** defining the tongs **92** are mounted in offset relationship to each other so that the planes generated by the arcuate movement thereof are parallel and disposed from each other. Thus, the tines **96** can move past each other as disclosed in FIG. 3 and engage a relatively small log **98**. The pair of tines are arcuately moved by a pair of double-acting cylinders **100** and pistons **102** which open and close the tongs. Each cylinder **100** is pivotally mounted on the frame means on a horizontal axis **104** parallel to the tine axes **94**, but transversely outwardly disposed therefrom. The pistons **102** are pivotally connected to the tongs as at **106**. A pair of hoses **108** for each cylinder extends along the inside of the legs **72** comprising the boom, through the hollow stud **84**, and into contact with the respective cylinders **100**. While the rotatable stud **84** enables the grapple means to rotate 360°, it will be appreciated that generally rotation of the grapple means is confined to that necessary to secure the logs in question which would be something less than 360°. Because the hoses for hydraulic fluid pass through a rotating hydraulic manifold mounted in the superstructure **52** above the hollow stud **84**, complete and continuous rotation of the grapple means is permitted.

Another pair of double-acting cylinders **110** and pistons **112** are provided for moving the forward support member. The free ends **114** of the pistons **112** are pivotally connected to the legs **58** of the forward support member at **116** while the cylinders **110** are pivotally connected to the vehicle body through pivotal connections **117** in the rear brackets **46** extending upwardly from the vehicle body. It will be seen that operation of these pistons moves the forward support member in an arcuate path with the rear support member merely acting as a guide and support for the boom. The arcuate movement of the forward support member causes the boom to move rearwardly and downwardly and forwardly and upwardly. When the boom is moved rearwardly and downwardly, the grapple means can engage logs lying on the ground. Movement of the boom to its forward position will lift one end of the logs off the ground so that they can be slid along the ground on their other end.

There is also provided a cable **118** which engages at one end a hook and eye **120** secured to the grapple frame means. The cable passes over a roller **122** mounted above the crossbar **40** of the rear support member and is then wound up on a drum, not shown. This cable serves the purpose of preventing the grapple means from swinging free when it is empty as well as pulling up on the grapple means when it is loaded.

While a preferred form of the invention has been illustrated in the drawings and discussed above, it should be adequately clear that considerable modification may be made thereto without departing from the principles of the invention. Therefore, the foregoing should be considered in all illustrative sense rather than a limiting sense, and accordingly, the extent of this invention should be limited only by the spirit and scope of the claims appended hereto.

What is claimed is:

1. A logger comprising:

a vehicle body having front and rear ends;

a boom having front and rear ends and operatively mounted on and spaced above the vehicle body, the boom extending generally longitudinally of the vehicle body and out over the rear end of the vehicle body;

rigid, unextendible first support means pivotally connected at one end to the vehicle body adjacent the rear end of the vehicle body and pivotally connected at another end to the boom intermediate its front and rear ends;

rigid, unextendible second support means pivotally connected at one end to the vehicle body forwardly of the connection of the first support means and pivotally connected at another end to the boom adjacent its front end;

piston and cylinder means attached to the vehicle body at one end and to one of the support means at the other end for moving the boom rearwardly and downwardly and forwardly and upwardly; and

grapple means mounted on the rear end of the boom.

2. The logger defined in claim **1** wherein the boom comprises a pair of legs having forward, approximately parallel portions and rear converging portions.

3. The logger defined in claim **1** wherein the first support means comprises a yoke having its free ends pivotally mounted on the vehicle body and its central portion pivotally connected to the boom.

4. The logger defined in claim **1** wherein the second support means comprises a yoke having its free ends pivotally mounted on the vehicle body and its central portion pivotally connected to the boom.

5. The logger defined in claim **1** wherein the piston and cylinder means is attached at one end to the vehicle body intermediate the first and second support means.

6. The logger defined in claim **5** wherein the piston and cylinder means is connected at the other end to the second support means.

7. The logger defined in claim **6** wherein the piston and cylinder means comprises a pair of hydraulic cylinders and pistons, one pair mounted on each side of the vehicle body and wherein the second support means comprises a yoke having two arms, each piston being connected to one arm.

8. The logger defined in claim **1** wherein the vehicle body has an upwardly extending rear bracket to which the first support means is connected adjacent the upper end of the rear bracket, and the first and second support means being operatively mounted to the vehicle body about horizontal axes, the horizontal axis of the first support means being upwardly disposed with respect to the horizontal axis of the second support means.

9. The logger defined in claim **1** wherein the grapple means is pivotally connected to the boom about a horizontal axis and is rotatably connected to the boom about a vertical axis.

10. The logger defined in claim **9** wherein the grapple means is continuously rotatable for 360° about the vertical axis.

11. The logger defined in claim **9** wherein the grapple comprises a pair of arcuate tines pivotally mounted for arcuate movement about horizontal axes, the tines being mounted offset so that the planes generated by the arcuate movement of the tines are parallel and disposed from each other whereby the tines can move past each other.

12. The logger defined in claim **11** additionally including a hollow boss secured to and defining the rear end of the boom, a stud rotatably mounted in the boss and operatively carried thereby, frame means pivotally mounted to the lower end of the stud extending from the boss about a horizontal axis, and a pair of pistons and cylinders pivotally mounted to the frame means about oppositely disposed horizontal axes parallel to and outwardly disposed from the horizontal axes defining the tine connections and each piston being connected at its free end to a respective tine.

13. The logger defined in claim **12** wherein the stud is hollow to allow conduits for hydraulic fluid to pass therethrough.

14. A logger comprising:

a vehicle body having front and rear ends;

a boom having front and rear ends and operatively mounted on and spaced above the vehicle body, the boom extending generally longitudinally of the ve-

hicle body and out over the rear end of the vehicle body;

a rear first, unextendible support means operatively and pivotally mounted on the vehicle body about a horizontal axis transverse to the vehicle body, the upper end of the first support means being operatively and pivotally mounted to the boom intermediate the boom ends;

a forward second, unextendible support means operatively and pivotally mounted on the vehicle body about a horizontal axis transverse to the vehicle body and downwardly disposed from the horizontal axis of the pivot connection of the first support means, the upper end of the second support means being operatively and pivotally mounted to the boom adjacent its front end;

piston and cylinder means operatively and pivotally

mounted on the vehicle body at one end and extending upwardly to a pivotal connection with the second support means; and

grapple means pivotally connected to the boom about a horizontal axis and rotatably connected to the boom about a vertical axis.

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