

July 4, 1944.

H. E. BUKOWSKY

2,352,885

LOAD POSITIONING MEANS

Original Filed Feb. 24, 1941

3 Sheets-Sheet 1

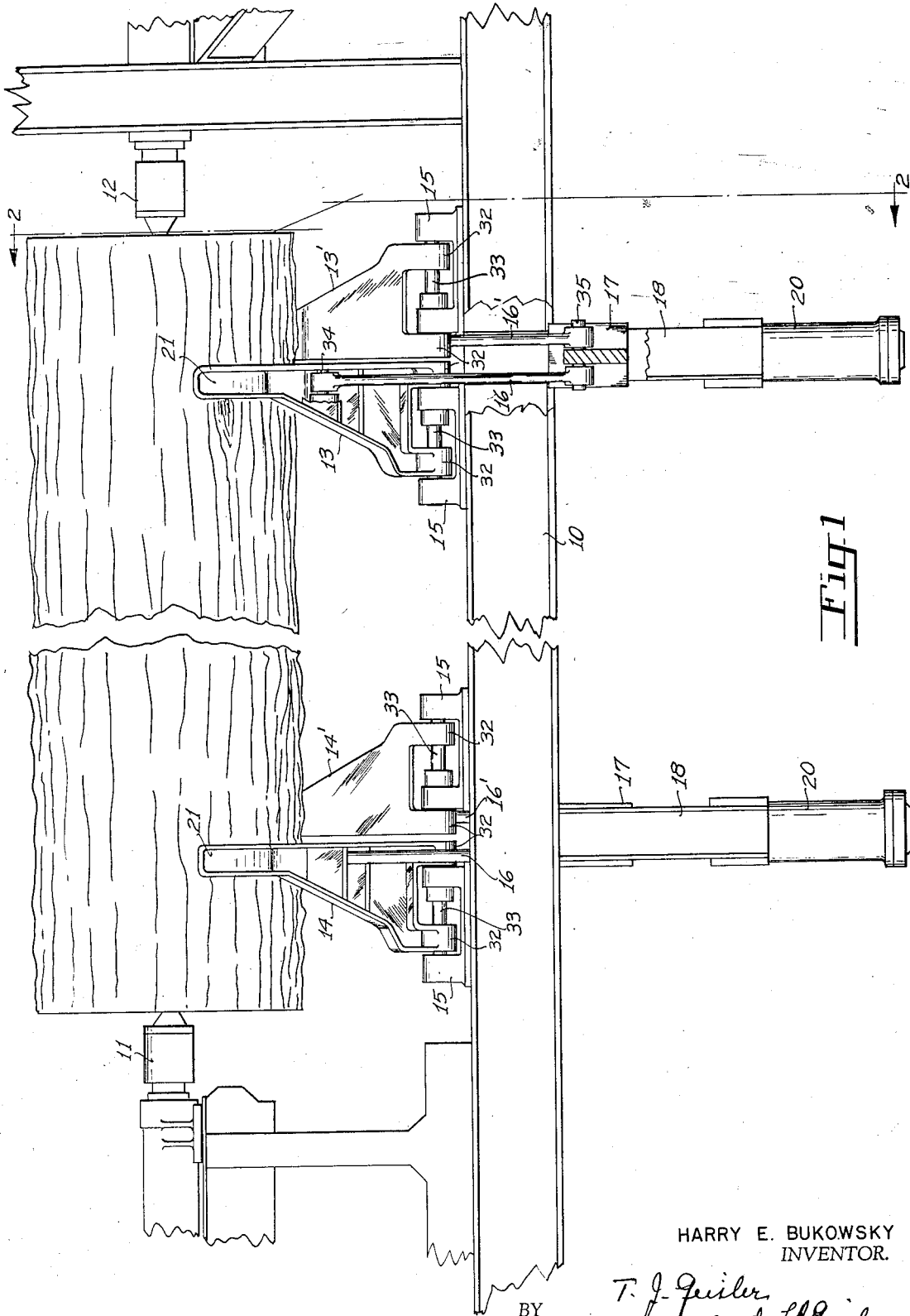


Fig. 1

HARRY E. BUKOWSKY
INVENTOR.

BY *T. J. Feiler and R. J. Feiler*
ATTORNEYS

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3 Sheets-Sheet 2

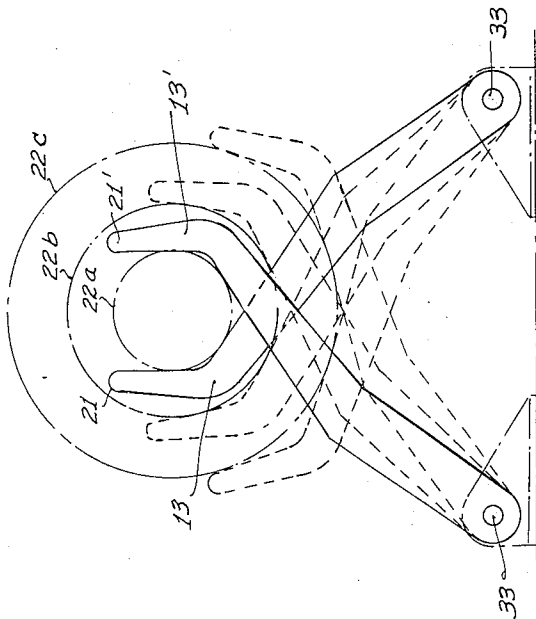


Fig. 3

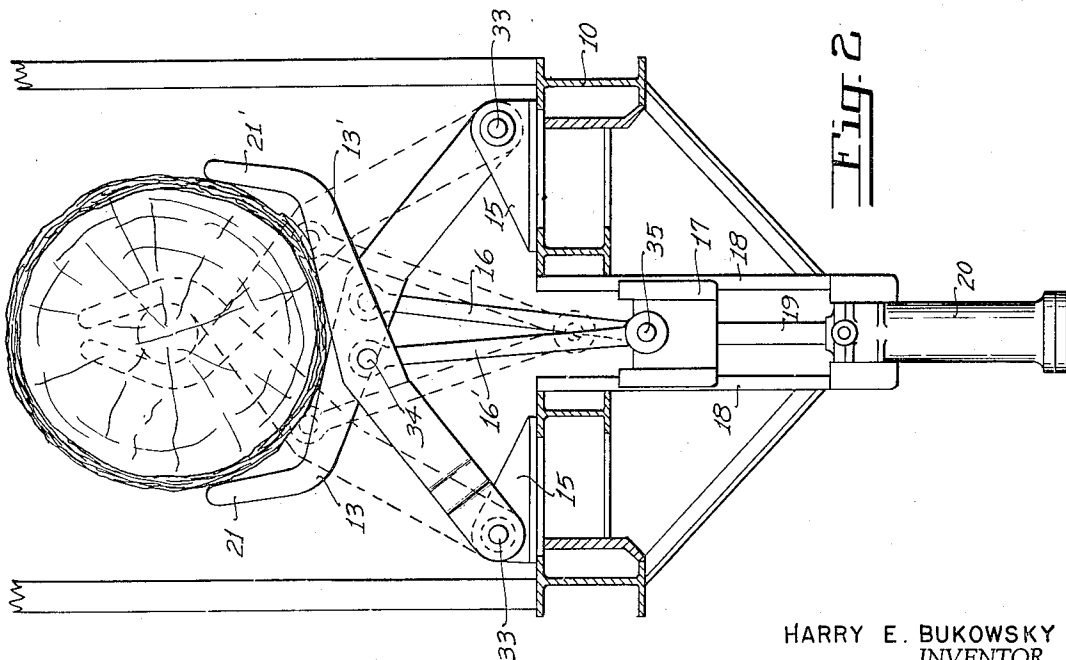


Fig. 2

HARRY E. BUKOWSKY
INVENTOR.

BY *T. J. Geisler*
and *H. Geisler*
ATTORNEYS

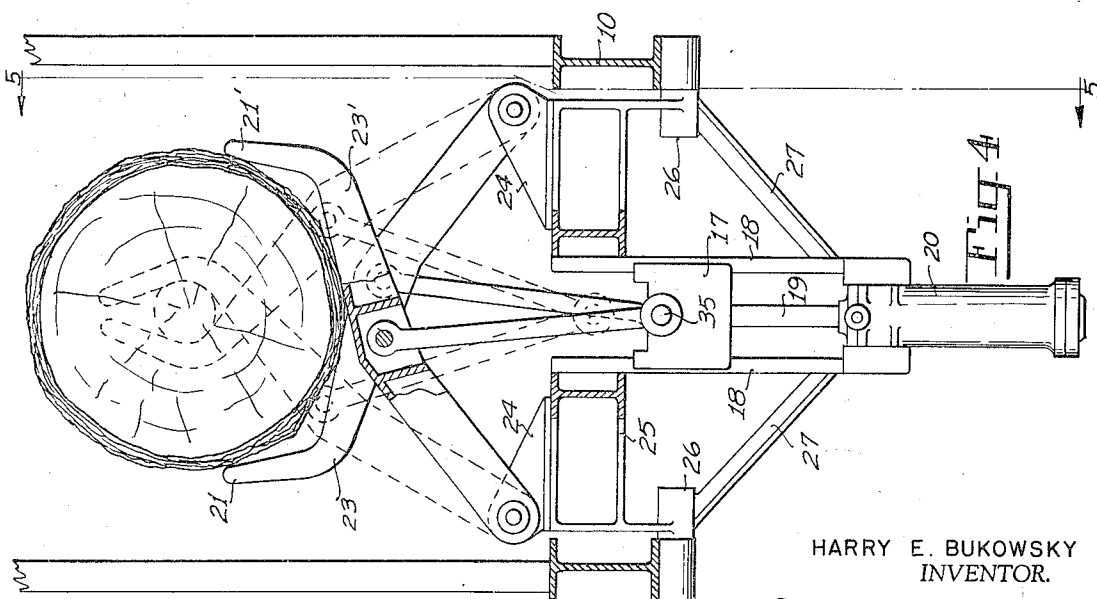
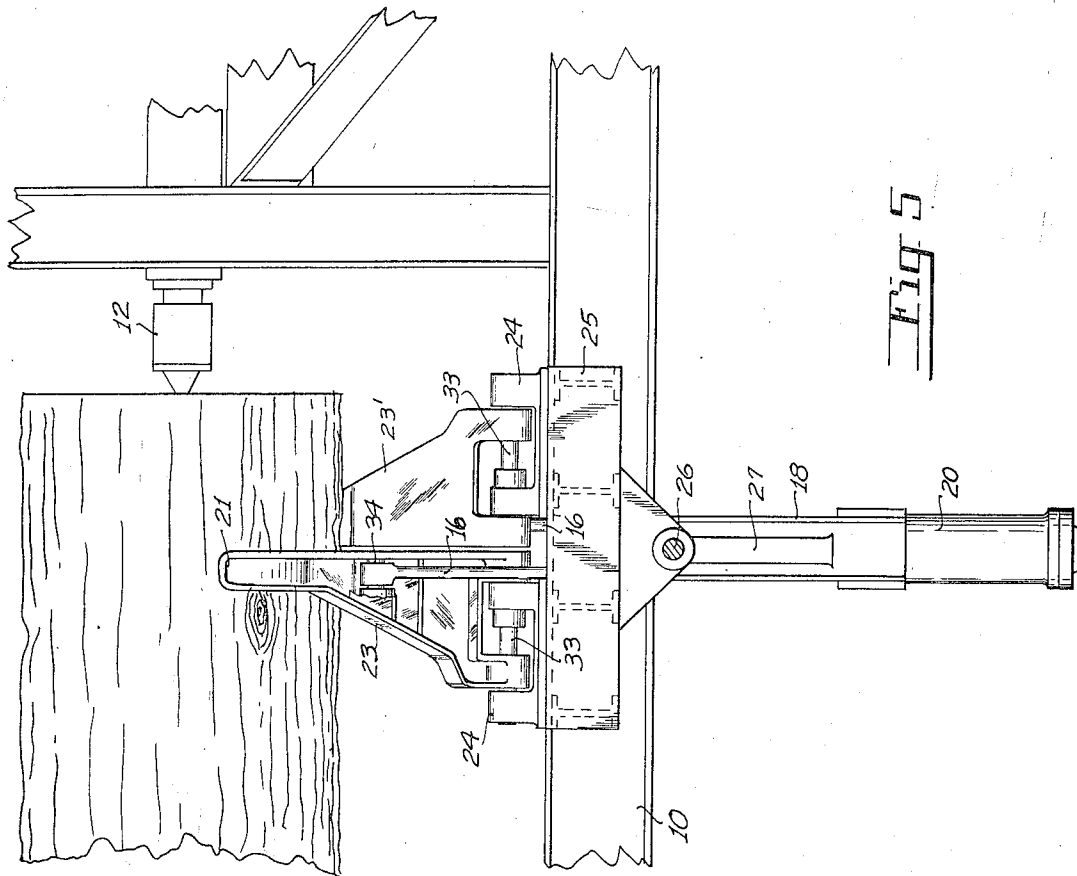
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HARRY E. BUKOWSKY
INVENTOR.

BY T. J. Geisler
and H. J. Geisler,
ATTORNEYS

UNITED STATES PATENT OFFICE

2,352,885

LOAD-POSITIONING MEANS

Harry E. Bukowsky, Port Townsend, Wash., assignor to Crown Zellerbach Corporation, San Francisco, Calif., a corporation of Nevada

Original application February 24, 1941, Serial No. 380,332. Divided and this application October 25, 1941, Serial No. 416,481

8 Claims. (Cl. 144—208)

This application is divided from my pending application, Serial No. 380,332, filed February 24, 1941, and entitled "Hydraulic log-barking machine," which application has since matured into the U. S. Patent, No. 2,328,545, patented September 7, 1943.

The present invention relates specifically to means for raising and positioning an object of general cylindrical, conical, or frustro-conical shape so that its axis will automatically be brought into a predetermined position, for example, into axial alinement with spindle means adapted to engage the longitudinal ends of the object, regardless of the diameter, or diameters, of such object.

My invention is adapted particularly for use in log-barking machines, such as that described in my co-pending application above mentioned in which the log is supported for rotation between spindle means which engage its opposite ends. It is obvious that in such a machine the log must be positioned with its axis in alinement with the axis of rotation of the spindle means or with any other means supporting the log for rotation, and, since there is considerable variation in the diameters, not only of different logs but often also of opposite ends of the same log, the proper positioning of the log in preparation for the performance of the work often requires considerable time.

The object of this invention is to provide a simple and more practical means for lifting the log or other object so that its axis will always be brought quickly into the exact position desired.

A further object of this invention is to have the means so arranged that when the log or other object is brought into proper position it can then not be raised beyond that position by such means regardless of its size, thus causing the positioning means to function more or less automatically.

The manner in which these objects are attained through this invention will be briefly explained with reference to the accompanying drawings in which the invention is shown as employed in connection with a log-barking machine.

In the drawings:

Fig. 1 is a fore-shortened side elevation of part of a log-barking machine showing my means employed for positioning the log;

Fig. 2 is a section taken on line 2—2 of Figure 1;

Fig. 3 is a more or less diagrammatic drawing illustrating how the load-lifting arms function with either large or small diameter objects;

Fig. 4 is an end elevation of a log in a log-

barking machine, showing a slight modification in the mounting of the load-raising elements; and

Fig. 5 is a fragmentary side elevation of the part of the machine of Fig. 4 further illustrating the modified mounting of the load-lifting arms.

In the log-barking machine shown in part in Figs. 1 and 2, the base 10 is formed of suitable longitudinal and transverse base frame members on which my load-positioning means are mounted.

The log on which the work or debarking is to be performed is brought into the log-barking machine by any suitable means, such as transfer chains (not shown), commonly employed for this purpose. The log must then be raised and positioned so that its axis will be in exact alinement with the spindle spurs 11 and 12. The spindles are mounted on suitable thrust and radial load ball bearings, and means (not shown) are provided in the machine for causing the spindle spurs then to penetrate a short distance into the ends of the log, after the log has been properly positioned, whereupon the log-lifting means may be lowered and the log left supported for rotation with the spindles. The means for rotating the log and spindles is not shown in the drawings since such means is common in log-barking machines and has no connection with this invention.

The invention concerns the log-lifting means, and these means include the two pairs of lifting arms 13, 13' and 14, 14'. Since these two pairs of lifting arms are identical in all respects, are identically mounted, and operate in the same manner, it will suffice therefore to describe one pair, thus the pair 13, 13'.

The arms 13, 13' are identical in structure and may comprise a channel-shaped body portion, preferably widened towards their attached or hinged ends and provided with suitable bearing hubs 32 through which the hinge shafts extend.

Each arm 13, 13' is pivoted or hinged to a suitable bracket 15 by means of a shaft 33, and each bracket 15 is attached to the base 10, the arms being pivoted for up and down movement in vertical planes, or in planes transverse to the axis of the log. The arms are pivoted at opposite sides of the base frame so that they will cross under the log or other object to be raised into position. Rods 16 and 16' are pivotally connected at their tops to the arms 13, 13' respectively by means of pins 34 which are journaled in the legs of the channel body, and these rods have their other ends pivotally connected by means of a pin 35 to a suitable cross-head 17 which is slidably

mounted on vertical guides 18. The cross-head 17 is adapted to be raised and lowered, and this may be done by mounting the cross-head 17 on a piston rod 19, movement of which is produced by a hydraulic cylinder which is indicated at 20. Thus upward movement of the piston rod 19 and cross-head 17 will produce movement in unison of the arms 13, 13' swinging upwardly in opposing arcs.

The shape of the arms 13, 13' is a very important feature in this invention. The arms are identical and are formed with identical upwardly-bent-end portions 21, 21'. The bent-end portions of the arms are located the same distance from the respective hinge points of the arms, and the distance from the hinge point to the point where the bent-end portion joins the main body portion of the arm is made approximately equal to the desired distance of the axis of the object or load from the hinge point when the object or load reaches its ultimate predetermined desired position. Since the arms are moved upwardly swinging in opposing arcs the main body portions of the arms, extending beneath the load lift the load as long as the arms can continue to move upwardly. This upward movement of the arms continues until the bent end portions contact opposite sides of the object whereupon further upward movement of the arms is prevented. When this limit is reached the axis of the object or load will have reached the predetermined distance from the two hinged points of the arms, which distance corresponds to the distance of the bent end portion from the arm hinge, as previously mentioned. Thus regardless of the diameter of the cross section of the object the longitudinal axis of the object will be in the desired predetermined position when the lifting arms have moved upwardly to the limit permitted by the object. In Fig. 2, the broken lines indicate the position of the arms when a log of smaller diameter is mounted in the machine; and Fig. 3 shows how logs, 22a, 22b and 22c or other objects of various diameters will be positioned by the arms with their axes always brought into exactly the same predetermined position. Thus the raising of the log or object can be done quickly and without any special skill on the part of the operator and with the certainty that when the bent-end portions 21, 21' bear against the opposite sides of the log or object, and thus are prevented from moving any further, the log or object will be properly positioned. However, due to the fact that the bottom ends of the arms of each pair remain spaced the same distance apart, no appreciable pinching of the log or object between the arms occurs until the end portions engage the log or object.

In Figs. 1 and 2 the log-lifting arms 13, 13' and 14, 14' are shown hinged to brackets 15, which are rigidly attached to the base frame 10. In Figs. 4 and 5 I show an improved means for supporting the lifting arms of my invention. In the modified construction illustrated in Figs. 4 and 5, the log-lifting arms 23, 23' are similarly hinged to brackets 24, for up and down movement, but each pair of brackets 24 is mounted on a rigid inner frame 25 which is pivoted transversely to the base frame 10 of the machine by hinge 26 at each side. In this construction the hydraulic cylinder 20, the vertical guides 18, and the cross-head 17, and side braces 27, are all rigidly connected to this inner pivotally-mounted frame 25. The pair of lifting arms 23, 23' with the hydraulically-operated lifting means, constitute a sort of pendulum support for the log or

other article and permit axial or end-wise movement of the log between the spindle spurs of the machine.

This modified mounting of the load-raising arms is a considerable advantage in log-barking machines where it may be necessary to slide the log end-wise on the arms in order to have the spindle spurs properly engage the log ends. If the outer bark surface of the log is unusually rough, considerable resistance would be offered to any slight sliding of the log end-wise on the arms 13, 13' and 14, 14' of Fig. 1 when forcing the log into engagement with the spindle spurs 11 and 12. With the pendulum supports illustrated in Figs. 4 and 5, it is not necessary to slide the log end-wise on the supporting arms but end-wise adjustment into position can be brought about with a slight tilt of the arm supports. This tilting of the arm supports also eliminates the side strain which would be imparted to the arms when mounted as in Figs. 1 and 2, if the log, or other heavy object, should be slid endwise.

While I have described the operation of my invention as a means for positioning a log in a log-barking machine, it is not to be understood that my invention is necessarily limited to such use. On the contrary, my invention will be found equally well adapted for use in other fields in which proper positioning of cylindrical, conical, or frusto-conical objects is required, as previously indicated. For example, my device is particularly adapted for raising and positioning heavy rolls of paper in printing presses, and for positioning metal rolls or cylinders preparatory to the machining of their surfaces, etc. It would also be obvious from Fig. 3 that an object of frusto-conical or conical shape could be positioned equally satisfactorily, since each pair of arms would function independently of the other pair, and each pair of arms would operate to position the axis of the object at the proper location regardless of the diameter of the object at the point of engagement of the arms.

It is not my intention to restrict my invention to any special field or to limit it in any particular otherwise than as set forth in the claims.

I claim:

1. In a device for raising and positioning an object having a longitudinal axis, a supporting base, a pair of identical lifting arms hinged at fixed points at opposite sides of said base for movement in arcs transverse to said base, said arms having main portions extending in opposite directions beneath said object and adapted to raise said object, said arms having identical upwardly-bent end portions adapted to engage opposite sides of said object and thereby to limit the extent to which said object can be raised by said arms, fluid pressure means for moving said arms upwardly in crossed formation, whereby, when said arms are caused to raise said object to the limit permitted by said bent end portions said object will be in a predetermined axial position regardless of the size of said object but said arms will not exert any appreciable pinching action until said object has been raised to its desired position.

2. A device of the character described including a supporting base, a plurality of pairs of lifting arms hinged to said base at spaced points for movement in arcs transverse to said base, the arms of each pair extending in opposite directions beneath the object to be raised and having identical upwardly-bent end portions at their free ends located at equal distances from the respective

hinge points and adapted to engage opposite sides of the object when the object has been raised a sufficient distance, the arms of each pair adapted to be moved upwardly in crossed formation and means for moving the arms of each pair in unison, whereby, when said arms are caused to raise said object said bent end portions will limit the extent of the raising to a predetermined axial position regardless of the size of said object but said arms will not exert any appreciable pinching action until said object has been raised to its desired position.

3. In a device for raising and positioning an object having a longitudinal axis, a rockable support mounted to pivot on an axis transverse to the axis of said object, a pair of lifting arms hinged to said support for movement in arcs transverse to the axis of said object, said arms being identical, said arms having main portions extending in opposite directions beneath the object and having identical upwardly-bent end portions at the free ends of the main portions, means for moving said arms upwardly in crossed formation, whereby when said arms are caused to raise said object said bent-end portions will limit the extent of the raising to a predetermined position regardless of the size of said object, and whereby the pivotal mounting of said support will permit some longitudinal movement of said object while supported on said arms.

4. In a device of the character described, a base, a rockable support mounted on said base to pivot on an axis transverse to said base, a pair of lifting arms of identical size and shape hinged to said support at spaced points for movement in arcs transverse to said base, said arms having main portions extending in opposite directions beneath the object to be raised and having identical upwardly-bent free end portions adapted to engage opposite sides of the object when it has been raised a sufficient distance, means on said support for moving said arms upwardly in unison in crossed formation.

5. A device for raising and positioning an object having a substantially circular cross-section, said device including a base, a plurality of supports mounted to pivot on an axis transverse to the axis of said object, a pair of lifting and positioning arms hinged to each of said supports for movement in arcs transverse to the axis of said object, the arms of each pair being identical, the arms of each pair having main portions extending in opposite directions beneath the object and having identical upwardly-bent end portions at the free ends of the main portions adapted to engage opposite sides of said object when the arms have been swung upwardly a sufficient distance, means on each support cooperating with the arms of the respective pair for moving the arms of said pair in unison upwardly in crossed formation, whereby, when said arms are caused to raise said object said bent end portions will limit the extent of the raising to a predeter-

mined axial position regardless of the size of said object, and whereby the pivotal mounting of said supports will permit some longitudinal movement of said object while supported on said arms.

6. In a log-barking machine, means for positioning the log in the machine, said log-positioning means comprising pairs of lifting arms, the arms in each pair being identical in size and shape pivotally mounted at relatively fixed spaced points at opposite sides of said machine and movable in opposing arcs transverse to the log axis, said arms having main portions extending beneath the log and said arms having identical free bent-end portions adapted to engage opposite sides of the log when the arms have been swung upwardly a sufficient distance, and hydraulic means for moving the arms of each pair upwardly in opposing arcs, whereby when said arms are raised to the extent permitted by engagement of said bent-end portions with the log, said log will be properly positioned regardless of its diameter, but said arms will not exert any appreciable pinching action on said log until said log has been raised to the limit permitted by said bent-end portions.

7. In a device of the character described, a pair of lifting and positioning arms, said arms being identical and each having a main body portion and an upwardly-bent end portion, the main portions of said arms extending in opposite directions beneath the object to be raised, said arms pivotally mounted at relatively fixed points to swing in opposing arcs, means for swinging said arms upwardly in unison so as to raise the object, the upwardly-bent end portions located at the free ends of said main body portions and at equal distances from the pivotal points of the respective arms, whereby said bent end portions, by engaging opposite sides of the object, will limit the extent to which the object can be raised by the arms and whereby said arms will not exert any appreciable pinching action on the object until the object has been raised to the desired limit.

8. In a device for raising and positioning an object having a substantially circular cross-section, a pair of lifting and positioning arms, said arms having main portions hinged at spaced relatively fixed points for movement in opposing arcs and extending in opposite directions beneath the object, means for moving said arms and thereby lifting said object, said arms having upwardly-bent end portions at their free ends, the distance of each bent end portion from the arm hinge being approximately equal to the desired distance of the axis of the object from the hinge point when the object is in its desired position, whereby said bent end portions will limit the extent to which said arms can raise said object and said limit will depend upon the diameter of said object.

HARRY E. BUKOWSKY.