

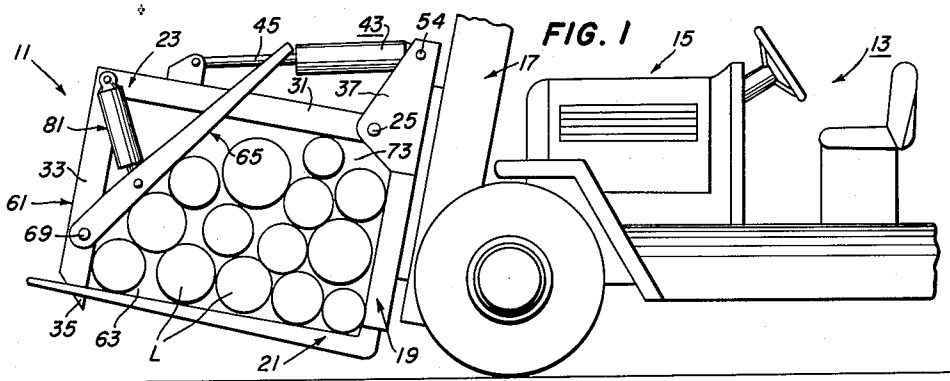
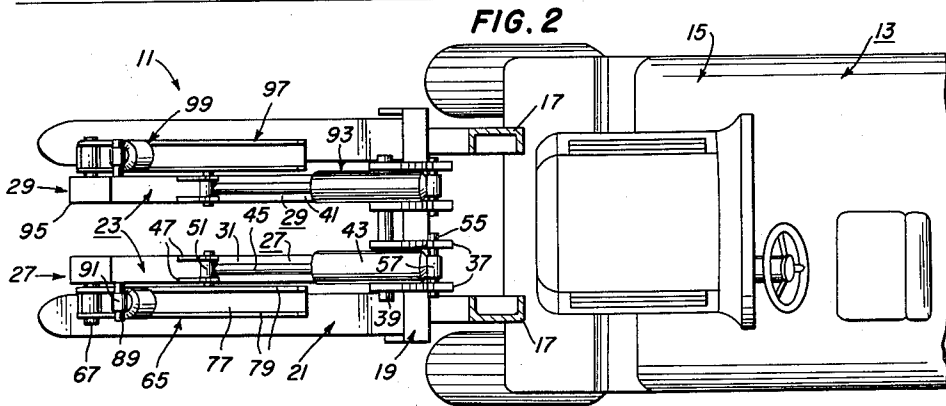
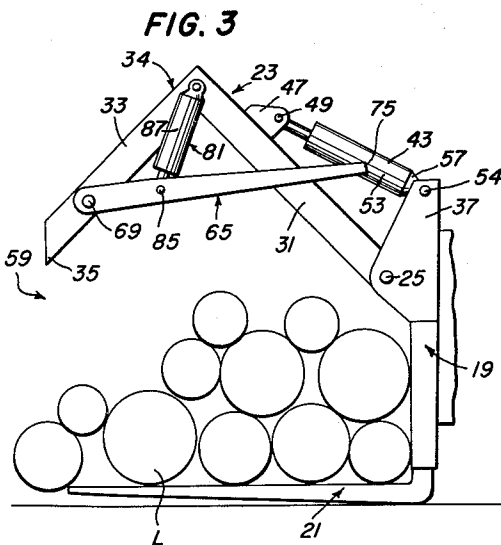
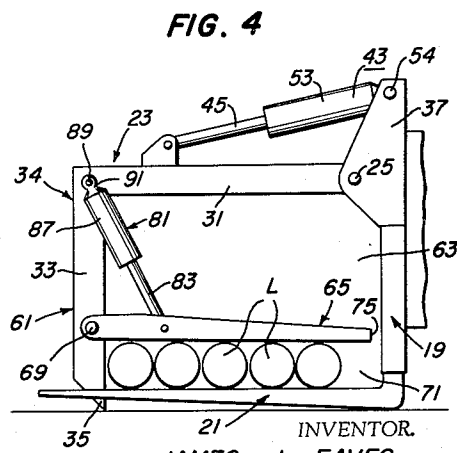
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DEVICE FOR HANDLING LOGS AND THE LIKE

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DEVICE FOR HANDLING LOGS AND THE LIKE

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This invention relates to improvements in devices for handling logs, poles, pilings, lumber and the like, and is particularly adapted for use with a so-called fork-lift type of handling machine.

In using the above mentioned type of machine, the logs are carried by the load supporting structure or forks with the forks contacting the logs intermediate the ends thereof and with the logs extending transversely of the machine and projecting laterally out in opposite directions from the forks. In the use of the conventional machine of this type, the logs had to be evenly balanced on the lifting forks or they would fall off when traveling over uneven and rough terrain. In other words, it was necessary for the forks to contact the logs at the center of gravity thereof or the logs would tilt to one side and fall off.

Thus, one of the objects of the present invention is to provide, in a machine for handling logs and the like, an attachment or device for holding the logs and the like on the lifting forks so that even though the logs and the like are not evenly balanced on the forks they will not fall off.

A further object is to provide such a device that is more versatile than previous devices of this type in that it can handle a bundle of logs and the like as well as a single flat layer thereof.

A further object is to provide such a device which holds the logs and the like by means of an arm that presses downwardly thereon.

A further object is to provide such an arm that is selectively positionable to vary the size of the space which receives the logs and the like.

A further object is to provide such a device which makes it possible to carry a variety of quantities of logs and the like on a fork-lift, as for example, bundles of 25 as well as a few can be carried.

A further object is to provide such a device which, due to the fact that the logs and the like do not have to be balanced, eliminates much maneuvering to exactly position the logs and the like, thereby saving much time and making it an easier job.

A further object is to provide such a device which is adapted to hold packaged lumber in place while traveling over rough terrain.

A further object is generally to improve the design and construction of devices for handling logs and the like.

The means by which the foregoing and other objects of the present invention are accomplished and the manner of their accomplishment will be readily understood from the following specification upon reference to the accompanying drawings, in which:

FIG. 1 is a side elevational view of the device of the present invention shown in use on a fork-lift truck and with only a fragmentary portion of the fork-lift truck being shown.

FIG. 2 is a plan view of the device of FIG. 1, but with the load being removed therefrom.

FIG. 3 is a view of a portion of the apparatus of FIG. 1, but showing the log retainer in a raised position and the arm in a retracted position.

FIG. 4 is a view similar to FIG. 3, but showing the retainer in a lowered position and the arm in a substantially horizontal position.

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Referring now to the drawings in which the various parts are indicated by numerals, it is contemplated that the attachment or device 11 of the present invention be used with any suitable machine adapted to handle logs, poles, pilings, lumber and the like. For example, a typical machine with which the device 11 is adapted to be used is best shown in FIGS. 1 and 2, wherein it will be seen a handling machine 13 of the fork-lift type includes a self-propelled wheeled vehicle 15 having a mast 17 adjacent the forward part thereof upon which is slidably mounted a carriage 19 adapted to be moved upwardly and downwardly along mast 17 by suitable means to raise and lower the load, which is illustrated in the figures as logs L. Also, in the usual manner, mast 17 is adapted to be power actuated to tilt the mast forwardly or rearwardly, with one of such rearwardly tilted positions being shown in FIG. 1 and a more upright position being shown in FIGS. 3 and 4. In addition, machine 13 preferably includes the usual load supporting structure 21 attached to carriage 19 and extending forwardly therefrom, and which is preferably in the form of the usual pair of lift-forks that are spaced laterally and attached adjacent the lower end of carriage 19 in the usual manner for upward and downward movement therewith.

Device 11 includes a load retainer 23 pivotally joined adjacent its inner end to carriage 19 for pivot about a horizontal axis as at 25. Load retainer 23 includes two substantially identical side-by-side portions 27, 29, and the following detailed description of portion 27 will suffice for both: Portion 27 includes, in general, a rigid top member 31, extending from adjacent carriage 19 outwardly, and a rigid end member 33 rigidly attached to the top member adjacent the outer end thereof from where it depends at substantially a 90 degree angle relative to the top member and terminates in a lower distal end 35, which is preferably rearwardly and downwardly sloping, as shown in the drawings. For purposes of clarity, the rigid combination of parts that includes top member 31 and end member 33 will be hereinafter referred to as angular structure 34. Angular structure 34 is pivotally attached to carriage 19 for pivot about horizontal pivot axis 25, preferably by the following means: A pair of side-by-side laterally spaced plates 37 are fixedly attached to carriage 19 by suitable means, as by welding, and a horizontally extending pin 39 extends through aligned apertures in plates 37 and top member 31. Pin 39 preferably extends laterally across to portion 29 and is used for the pivoting of top member 41, which is the part of portion 29 that corresponds to top member 31.

A double-acting jack 43 is provided for pivoting angular structure 34. Jack 43 is preferably, though not necessarily, of a hydraulic type and is of the usual construction including a piston rod 45, which is pivotally attached to top member 31 intermediate the ends thereof as by the following means: A pair of laterally spaced attachment plates 47 are fixedly attached on the upper side of top member 31 as by welding or the like, and a pin 49 extends through aligned apertures in attachment plates 47 and in the end portion 51 of piston rod 45. The cylinder 53 of jack 43 is pivotally attached to carriage 19 for pivot about a substantially horizontal axis 54 by suitable means as a pin 55 extending through aligned apertures in plates 37 and through an aperture in the end portion 57 attached to cylinder 53. It should be noted that pivot axis 54 is preferably spaced above and offset somewhat rearwardly relative to pivot axis 25.

It will be understood that when jack 43 is retracted, angular structure 34 will be moved thereby into a raised position, as for example, like the one shown in FIG. 3,

wherein it will be seen an opening 59 is provided between the angular structure and the load supporting structure 21 so that the logs L can be placed thereon or removed therefrom. Also, it will be understood that when jack 43 is extended, angular structure 34 will be moved thereby into a lowered position, as shown in FIG. 4, in which position the angular structure with carriage 19 and supporting structure 21 establish an enclosure 61 defining a transverse opening or space 63. Thus, it will be seen in FIG. 4 that top member 31, which is substantially horizontal and spaced above supporting structure 21, forms the top of enclosure 61, and the load supporting structure 21 forms the bottom thereof. In addition, it will be understood that end member 33 forms one end of enclosure 61, and the portion of carriage 19 opposite from end member 33 forms the other end so that the substantially rectangular enclosure is established.

A substantially rigid and substantially straight arm 65 is pivotally joined to end member 33 by suitable means as a pin 67 so that the arm 65 can pivot relative to end member 33 about a substantially horizontal axis 69. Pivot axis 69 is located on end member 33 intermediate the ends thereof but is spaced closer to distal end 35 so that when the arm 65 is in a first or substantially horizontal position, as shown in FIG. 4, the arm extends in substantially spaced parallel relationship over load supporting structure 21 and substantially perpendicular to end member 33, whereby a limited space 71 is established. It will be noted in FIG. 4 that arm 65 extends into closely spaced relationship with carriage 19 and that arm 65 defines the top of space 71 and load supporting structure 21 defines the bottom thereof. In addition, it will be understood that that part of end member 33 below pivot axis 69 defines one end of limited space 71, and the opposite part of carriage 19 defines the other end, so that a substantially elongated limited space 71 is established.

Arm 65 is offset to one side of top member 31 and end member 33, as best seen in FIG. 2, so that the arm is movable upwardly to an angular or raised position, as best seen in FIG. 1, in which position the arm extends across one corner of enclosure 61 to define a space 73 much greater than limited space 71, whereby a much greater quantity of logs L may be received therein, as best seen in FIG. 1. Thus, space 73 is defined along the top by a portion of top member 31, along the bottom by supporting structure 21, along one side by a portion of end member 33, along the opposite side by a portion of carriage 19, and along one corner by a portion of arm 65. It should be noted that in the position hereinabove described the end of arm 65 extends above top member 31 whereby a substantial portion of the arm is out of the way of opening 63 to provide a large space 73.

Arm 65 is preferably slightly tapered towards the distal end 75 thereof and is preferably, though not necessarily, formed of a channel member with the web portion 77 thereof forming the bottom of the arm and the spaced flange portions 79 extending vertically upwardly from the opposite side edges of web portion 77.

A jack 81 is provided for pivoting arm 65. Jack 81 is preferably, though not necessarily, of a hydraulic type and is of the usual construction including a piston rod 83 which is pivotally attached to arm 65 as by means of a pin 85 extending through aligned apertures in the end portion of the piston rod and in arm 65. The cylinder 87 of jack 81 is pivotally attached to angular structure 34 adjacent the juncture of top member 31 and end member 33, as by means of a pin 89 attached to the angular structure and extending through an aperture in end portion 91 of cylinder 87. It will be understood that when jack 81 is retracted, arm 65 will be moved to the angular position best shown in FIG. 1, and when the jack is extended, the arm will be swung downwardly in a clockwise direction to a position such as that shown in FIG. 4.

Load retainer portion 29 is substantially identical with load retainer portion 27 and, thus, includes the following

general parts, which are interrelated and connected by substantially the same means as heretofore described for portion 27: jack 93, angular structure 95, arm 97, and jack 99, which respectively correspond with jack 43, angular structure 34, arm 65, and jack 81. The only difference between portions 27 and 29 of load retainer 23 is in the fact that one is of right-hand construction and the other of left-hand construction, that is, the arms 65 and 97 are respectively on the outside of angular structures 34 and 95. In other words, the arms 65, 97 are on the sides of the angular structures 34, 95 which are remote from each other, as best seen in FIG. 2.

In the operation of the device 11 of the present invention, it will be understood that load retainer 23 is raised to a position such as that shown in FIG. 3 by actuation of jacks 43, 93 so that the logs can be placed on load supporting structure 21, as by moving vehicle 15 to carry the load supporting structure forwardly and scoop the logs up. Then, load retainer 23 is lowered by actuation of jacks 43, 93 so that the load retainer is in a lowered position, as best seen in FIG. 1. Finally, arms 65, 97 are swung downwardly by means of jacks 81, 99, as heretofore described, to hold the load tightly. The jacks 43, 81, 93 and 99 are independently operable, but normally it is advisable to operate jacks 43 and 93 simultaneously and jacks 81 and 99 simultaneously so that the angular structures 34, 95 are operated simultaneously in lateral alignment, and arms 65, 97 are operated simultaneously in lateral alignment. It will be understood that such simultaneous movement as above described would be useful when the load is laterally in straight alignment, but that when the load varies, as for example, if the load extended higher under one of portions 27, 29 than the other, it would be desirable to operate the jacks independently as required.

From the foregoing description it will be understood that a very efficient and unique means is provided for holding a load, as logs, poles, pilings, lumber and the like, on a supporting structure so that the logs or the like do not have to be evenly balanced thereon but are retained against tilting when going over rough terrain and the like. In addition, it will be understood that a very versatile device is provided in which the space for confining the logs L can be varied to accommodate the load in a limited space, such as space 71, or in a much greater space, such as space 73, or in various sizes of spaces therebetween.

Although the invention has been described and illustrated with respect to a preferred embodiment thereof, it is to be understood that it is not to be so limited since changes and modifications may be made therein which are within the full intended scope of this invention as herein-after claimed.

I claim:

1. In a machine for handling logs and the like of the type including a carriage and a load supporting structure connected to said carriage and projecting forwardly therefrom, the improvement in said machine comprising a retainer having an inner end pivotally joined to said carriage above said supporting structure and pivotable between a lowered position and a raised position, when in said lowered position said retainer establishing with said carriage and said supporting structure an enclosure, jack means attached adjacent one end to said carriage and attached adjacent the opposite end to said retainer for moving said retainer between said lowered and raised positions, when in said raised position said retainer establishing an opening between the lowered end thereof and said supporting structure to permit the load to be moved from and to said supporting structure, at least one rigid arm pivotally joined to said retainer and pivotable between a first position and a second position, an additional jack means attached adjacent one end to said retainer and attached adjacent the opposite end to said arm for moving said arm between said first position and said second position, when said retainer is in said lowered position and when said

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arm is in said first position said arm extending substantially horizontally above said supporting structure in spaced relationship thereto to establish a limited space for receiving a quantity of logs and the like, when said retainer is in said lowered position and when said arm is in said second position said arm extending upwardly at an angle across a corner of said enclosure to establish a greater space for receiving a greater quantity of logs and the like.

2. In a machine for handling logs and the like of the type including a carriage and a load supporting structure connected to said carriage and projecting forwardly therefrom, the improvement in said machine comprising a retainer having an inner end pivotally joined to said carriage above said supporting structure and pivotable between a lowered position and a raised position, said retainer including at least one top member extending outwardly from adjacent said carriage and at least one end member attached to said top member adjacent the outer end thereof and depending therefrom, when in said lowered position said retainer establishing with said carriage and said supporting structure a substantially rectangular enclosure, jack means attached adjacent one end to said carriage and attached adjacent the opposite end to said retainer for moving said retainer between said lowered and raised positions, when in said raised position said retainer establishing an opening between the lower end of said end member and said supporting structure to permit the load to be moved from and to said supporting structure, at least one rigid arm pivotally joined to said end member adjacent the lower end thereof and pivotable between a first position and a second position, an additional jack means attached adjacent one end to said retainer and attached adjacent the opposite end to said arm for moving said arm between said first position and said second position, when said retainer is in said lowered position and when said arm is in said first position said arm extending substantially horizontally above said supporting structure in spaced relationship thereto to establish a limited space for receiving a quantity of logs and the like, when said retainer is in said lowered position and when said arm is in said second position said arm extending upwardly at an angle from said end member and projecting upwardly beyond said top member to establish a greater space for receiving a greater quantity of logs and the like.

3. In a machine for handling logs and the like of the type including a carriage and a load supporting structure connected to said carriage and projecting forwardly therefrom, the improvement in said machine comprising a retainer having an inner end pivotally joined to said carriage above said supporting structure and pivotable between a lowered position and a raised position, said retainer including at least one top member extending outwardly from adjacent said carriage and at least one end member attached to said top member adjacent the outer end thereof and depending therefrom, when in said lowered position said retainer establishing with said carriage and said supporting structure a substantially rectangular enclosure, jack means attached adjacent one end to said carriage and attached adjacent the opposite end to said retainer for moving said retainer between said lowered and raised positions, when in said raised position said retainer establishing an opening between the lower end of said end member and said supporting structure to permit the load to be moved from and to said supporting structure, at least one rigid arm pivotally joined to said end member in spaced adjacency to the lower end thereof and pivotable between a first position and a second position, an additional jack means attached adjacent one end to said retainer and attached adjacent the opposite end to said arm for moving said arm between said first position and said second position; when said retainer is in said lowered position and when said arm is in said first position said arm extending substantially horizontally above said supporting structure in spaced relationship thereto to estab-

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lish a limited space bounded by said arm, a portion of said end member, an opposite portion of said carriage, and said supporting structure for receiving a quantity of logs and the like; when said retainer is in said lowered position and when said arm is in said second position said arm extending upwardly at an angle from said end member and projecting upwardly beyond said top member to establish a greater space bounded by a portion of said top member, a portion of said arm, a portion of said end member, a portion of said carriage, and said supporting structure for receiving a greater quantity of logs and the like.

4. In a machine for handling logs and the like of the type including a carriage and a load supporting structure connected to said carriage and projecting forwardly therefrom, the improvement in said machine comprising a retainer including a pair of angular structures respectively having inner ends pivotally joined to said carriage above said supporting structure and independently pivotable between a lowered position and a raised position; each of said angular structures including a top member extending outwardly from adjacent said carriage and an end member attached to said top member adjacent the outer end thereof and depending therefrom, when in said lowered position each of said angular structures establishing with said carriage and said supporting structure a substantially rectangular enclosure, a pair of jack means respectively attached adjacent one of the ends thereof to said carriage and respectively attached adjacent the opposite ends thereof to said angular structures for moving said angular structures independently between said lowered and raised positions, when in said raised position each of said angular structures establishing an opening between the lower end of said end member and said supporting structure to permit the load to be moved from and to said supporting structure, a pair of rigid arms respectively pivotally joined to said end members adjacent the lower ends thereof and pivotable between a first position and a second position, an additional pair of jack means respectively attached adjacent one of the ends thereof to said angular structures and respectively attached adjacent the opposite ends thereof to said arms for moving each of said arms between said first position and said second position, when said angular structures are in said lowered position and when said arms are in said first position said arms extending substantially horizontally above said supporting structure in spaced relationship thereto to establish a limited space for receiving a quantity of logs and the like, when said angular structures are in said lowered position and when said arms are in said second position said arms extending upwardly at an angle from said end members and projecting upwardly beyond said top members to establish a greater space for receiving a greater quantity of logs and the like.

5. In a machine for handling logs and the like of the type including a carriage and a load supporting structure connected to said carriage and projecting forwardly therefrom, the improvement in said machine comprising a retainer including a pair of angular structures respectively having inner ends pivotally joined to said carriage above said supporting structure and independently pivotable between a lowered position and a raised position, when in said lowered position each of said angular structures establishing with said carriage and said supporting structure an enclosure, a pair of jack means respectively attached adjacent one of the ends thereof to said carriage and respectively attached adjacent the opposite ends thereof to said angular structures for moving said angular structures independently between said lowered and raised positions, when in said raised position each of said angular structures establishing an opening between the lower end thereof and said supporting structure to permit the load to be moved from and to said supporting structure, a pair of rigid arms respectively pivotally joined to said angular structures and pivotable between a first position and a second position, an additional pair of jack

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means respectively attached adjacent one of the ends there-
of to said angular structures and respectively attached
adjacent the opposite ends thereof to said arms for moving
each of said arms between said first position and said
second position, when said angular structures are in said
lowered position and when said arms are in said first posi- 5
tion said arms extending substantially horizontally above
said supporting structure in spaced relationship thereto
to establish a limited space for receiving a quantity of
logs and the like, when said angular structures are in said 10
lowered position and when said arms are in said second

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position said arms extending upwardly across the corner
of said enclosure to establish a greater space for receiving
a greater quantity of logs and the like.

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