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TIMBER SLEDGE

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2 Sheets-Sheet 1

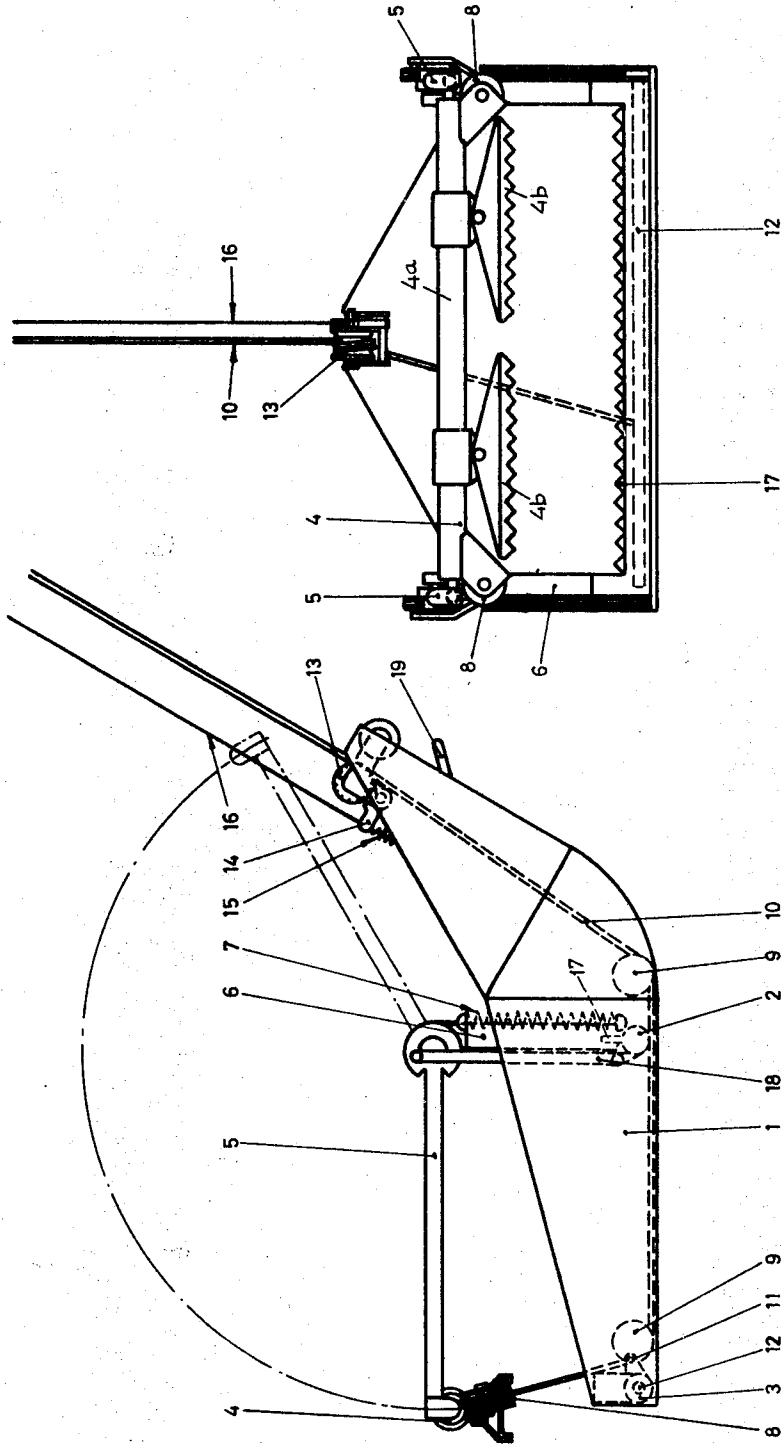


Fig. 2

Fig. 1

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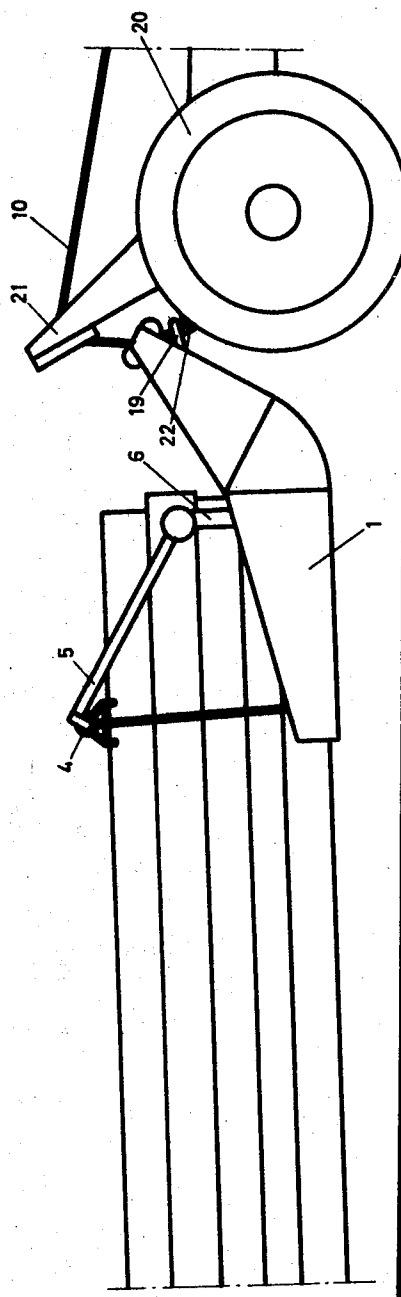


Fig. 3

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8 Claims

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### ABSTRACT OF THE DISCLOSURE

A log skidding device of the type including a skid pan provided with a clamping device for securing the fore ends of logs to be transported on the pan and intended to be towed by a self-propelled vehicle, as for instance a forest tractor, provided with a winch and a rope trestle or similar device for the winch rope at the rear end of the vehicle. The clamping device on the skid pan is movable between a closed position and an open position and the free end of the winch rope from the towing vehicle is connected to the skid pan by way of the clamping device in such a way that the clamping device is closed and kept closed by the traction in the winch rope. Preferably, the skid pan is also provided with rope locking means for locking the winch rope to the skid pan at a point along the rope which is closer to the vehicle than the part of the rope cooperating with the clamping device, whereby the clamping device can be kept closed even if the winch rope is slackened.

The invention relates to a log skidding device for skidding logs or untrimmed trees after a self-propelled towing vehicle, as for instance a forest type tractor, provided with a winch.

#### Summary of the invention

The object of the invention is to provide an improved log skidding device of the type comprising a skid pan, which is provided with clamping means for securing the fore ends of the logs to be transported on the skid pan and which is intended to be towed by a towing vehicle which is provided with a winch and at its rear end with a rope trestle or a similar device for the winch rope. The log skidding device according to the invention is characterized in that the clamping device on the skid pan is movable between a closed clamping position and an open releasing position and that the skid pan and the clamping device are provided with means for connecting the free end of the winch rope from the towing vehicle to the pan by way of the clamping device in such a manner that the clamping device is closed and kept closed by a force corresponding to the drag force in the winch rope and that the skid pan with the logs secured thereon can be pulled up to the rear end of the towing vehicle by means of the winch rope. Furthermore, a guide pulley or a similar device for the winch rope is mounted at the fore end of the skid pan in such a way that the skid pan with the loaded logs can be lifted from the ground at the rear end of the towing vehicle by means of the winch rope and kept hanging in this. Preferably, the skid pan is also provided with releasable rope locking means for locking the winch rope relative to the skid pan at a point along the rope which is closer to the towing vehicle than the part of the rope cooperating with the log clamping device.

A log skidding device according to the invention has several very important advantages. Thus, for instance the logs to be transported can be loaded on the skid pan with this positioned at a distance from the towing vehicle corresponding to the length of the winch rope,

whereafter the skid pan together with the logs can be pulled up to the rear end of the vehicle by means of the winch rope, during which operation the logs are automatically clamped and held in position on the skid pan by the traction force in the winch rope. When the skid pan together with its load of logs has been pulled up to the rear end of the towing vehicle, the skid pan and the fore ends of the logs resting in the skid pan can be lifted from the ground by means of the winch rope and kept hanging in this, whereafter the logs can be dragged by the vehicle across the ground hanging in this position. If the skid pan is provided with rope locking means for locking the winch rope relative to the skid pan at a point along the rope which lies closer to the towing vehicle than the part of the winch rope cooperating with the log clamping device, it is also possible to hang up the skid pan on a tow hook or a similar member on the towing vehicle during the transport, whereby no constant drag in the winch rope is necessary during the transport proper. The fact that the skid pan and the fore ends of the logs loaded on the pan are raised from the ground and hanging in the towing vehicle at the rear end thereof during the transport of the logs gives the very important advantages that the drag from the logs is reduced considerably and that a substantial portion of their weight is transferred to the rear wheels of the towing vehicle, whereby the traction force of the vehicle can be increased substantially. If obstacles in the terrain are met which cannot be passed with the skid pan and the logs loaded thereto hanging at the rear end of the towing vehicle, either in the winch rope or in a tow hook or similar, the skid pan can be lowered again to the ground, whereafter the vehicle can continue alone at the same time as the winch rope is payed out. If the skid pan is provided with the rope locking device mentioned in the foregoing for locking the winch rope relative to the skid pan, the logs will remain clamped on the skid pan in spite of the slackening of the winch rope. When the towing vehicle has passed the obstacle in the terrain, the skid pans and the attached logs can be pulled past the obstacle up to the vehicle by means of the winch, during which operation the logs are held in a clamped position on the skid pan under the action of the traction force in the winch rope. The same method can also be used for towing the logs up on a log pile or a loading platform or loading pocket. When the logs are to be released it is only necessary to slacken the winch rope and release the rope locking device, which locks the winch rope to the skid pan at a point along the rope closer to the towing vehicle than the part of the rope cooperating with the log clamping device. The rope locking device can be released for instance by means of a control rope from the towing vehicle. Thereafter the towing vehicle can drive on still towing the skid pan but leaving the logs where released by the skid pan. All operations, as for instance clamping and securing the logs on the skid pan, releasing the logs from the skid pan, towing the logs up on a log pile or a loading platform or pockets or past difficult obstacles in the terrain, can be carried out without the driver of the towing vehicle having to leave the vehicle. The log skidding device according to the invention is consequently very time- and work-saving and has also wide mobility even on a difficult ground.

#### Brief description of the drawing

In the following the invention will be further described with reference to the accompanying drawing which shows by way of example an embodiment of a log skidding device according to the invention. In the drawing:

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FIG. 1 is a side view of a log skidding device according to the invention;

FIG. 2 is a rear view of a log skidding device; and

FIG. 3 shows the log skidding device loaded with logs and hanging in its transport position at the rear end of a towing vehicle.

#### Description of the preferred embodiments

The log skidding device shown in the drawing comprises a skid pan 1 provided with front and rear transverse log supporting bunks 2 and 3 located close to the bottom of the pan. A transverse clamping jaw 4 is mounted at the outer ends of two arms 5 which are pivoted in two side posts 6 on the skid pan so as to be swingable in vertical direction. The jaw 4 comprises a transverse beam 4a supporting toothed jaw elements 4b. The arms 5 with the clamping jaw 4 can be swung between a closed clamping position shown with solid lines in FIG. 1 and an open releasing position shown with dash-and-dot lines. In the illustrated embodiment of the log skidding device according to the invention the swing arms 5 are connected to a spring 7 which tries to move the arms 5 together with the clamping jaw 4 to the open position. At its opposite ends the clamping jaw 4 is provided with guide pulleys 8 and two guide pulleys 9 are mounted close to the bottom of the skid pan. The winch rope 10 from the towing vehicle (as for instance the forest type wheel tractor 20 shown in FIG. 3), to which the log skidding device is coupled, runs over these guide pulleys. The free end of the winch rope 10 is attached to a lever 11 on a torsion spring 12 mounted in the pan 1. At its fore end the pan 1 is provided with an additional guide pulley 13 around which the winch rope 10 is wound a couple of turns and which is provided with a ratchet or locking mechanism 14, which is biased toward its normal locking position by a spring 15. In this position the ratchet mechanism 14 prevents the guide pulley 13 from rotating in the direction corresponding to a slackening of the winch rope 10. The locking mechanism can be moved to a second position by pulling on a control rope 16 from the towing vehicle. In this second position the locking mechanism 14 prevents the guide pulley 13 from rotating in the opposite direction. In the first mentioned normal position for the locking mechanism 14 the control rope 16 is kept slightly tightened for instance by means of a spring-actuated drum on the towing vehicle. The front log bunk 2 is rotatable in the skid pan 1 and provided with teeth 17. The log bunk 2 is coupled to the swing arms 5 through link rods 18.

When loading logs on the skid pan this rests on the ground with the clamping jaw 4 in its raised open position. The logs or trees to be transported are laid with one end, preferably the root end, on the log bunks 2 and 3 in the skid pan 1. Thereafter, the winch of the towing vehicle is started, whereby the clamping jaw 4 is swung downwards and the front log bunk 2 is rotated so that the teeth 17 engage the logs. By means of the winch rope 10 the skid pan 1 with the loaded logs can now be pulled up to the rear end of the towing vehicle 20. At the rear end of the vehicle the skid pan and the ends of the logs resting on the skid pan can be lifted up from the ground by means of the winch rope 10, as this runs over a rope trestle 21 or a similar device at the rear end of the towing vehicle 20. If the skid pan with its load must be lowered temporarily to the ground, as for instance in a steep slope or if the vehicle gets stuck, the rope locking mechanism 14 prevents the clamping jaw 4 from opening in spite of the fact that no traction is being applied to the winch rope 10. The torsion spring 12 will maintain the necessary clamping force for the logs on the skid pan, which clamping force has previously been generated by the reaction in the winch rope 10.

When the logs are to be unloaded from the skid pan, the winch on the towing vehicle is reversed so that the

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skid pan with the logs is lowered to the ground and the winch rope is slackened. Subsequently the locking mechanism 14 is switched over to its second position by pulling on the control rope 16, whereby the clamping jaw 4 is automatically opened by the springs 7. When thereafter the winch rope 10 is wound in again or the towing vehicle 20 is moved forward with the control rope 16 tightened, only the skid pan 10 is brought along, whereas the logs will remain, as the clamping jaw 4 cannot be closed as the locking mechanism 14 prevents the traction force applied to the winch rope 10 from being transmitted to the swing arms 5 and the clamping jaw 4.

At its fore end the skid pan 1 is provided with a tow-ring 19 by means of which the skid pan 1 during the transport of the logs secured on the skid pan can be hung up on a tow-hook 22 mounted at the rear end of the towing vehicle 20 at some distance below the guide pulley in the rope trestle 21. In this way the stability of the towing vehicle is improved substantially. Furthermore, the horizontal towing force is transferred directly from the towing vehicle 20 to the skid pan through the hook 22 and the ring 19 and not through the winch rope 10. If the skid pan is provided with the rope locking mechanism 14 described in the foregoing, the winch rope 10 can be slackened, when the skid pan 1 is hung up on the tow hook 22 on the vehicle 20. If the skid pan has no such rope locking mechanism 14, it will be necessary to keep the winch rope 10 tightened by means of the winch drum in order to maintain the necessary clamping force for the clamping jaw 4.

In the embodiment of the invention shown in the drawing and described in the foregoing the clamping jaw 4 is opened automatically by the springs 7, if the winch rope 10 is slackened and the rope locking mechanism 14 is switched to its second position by means of the control rope 16. In a modified embodiment of the log skidding device, however, the springs 7 can be omitted, in which case the clamping jaw 4 can be raised to its open position for instance by means of a control rope from the towing vehicle. On the vehicle this rope can be wound up on a winch drum or the like separate from the winch drum for the tow rope 10. In this modified embodiment the rope locking mechanism 14 for the winch rope 10 may be omitted, as the clamping jaw 4 will by its own weight hold the logs resting on the log bunks 2 and 3 in place, if the skid pan is resting on the ground and the winch rope 10 is slackened, as for instance when the towing vehicle is driven forward alone in order to pass or negotiate an obstacle or a steep slope or to pass a log pile, loading platform or loading pocket upon which the skid pan with the loaded logs is subsequently to be hauled by means of the winch rope 10.

I claim:

1. A log skidding device to be towed by a self-propelled towing vehicle (20) provided with a winch and a rope trestle device (21) for the winch rope (10) at its rear end, comprising a skid pan (1) provided with a log clamping device (4, 5) for securing the fore ends of logs to be transported on the skid pan, characterized in that said log clamping device is movable between a closed clamping position and an open releasing position and the skid pan and the log clamping device are provided with means (8, 9, 11) for connecting the free end of the winch rope (10) from the towing vehicle to the skid pan by way of said log clamping device in such way that the log clamping device is closed and kept closed by a force corresponding to the traction force in the winch rope and the skid pan with logs secured thereon can be pulled up to the rear end of the towing vehicle by means of the winch rope, guide means (13) for the winch rope being mounted at the fore end of the skid pan in such a way that the skid pan with logs secured thereon can be lifted from the ground at the rear end of the towing vehicle by means of the winch rope and kept hanging therein.

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2. A log skidding device as claimed in claim 1, wherein said skid pan is provided with a releasable rope locking device (13, 14) for locking said winch rope (10) relative to the skid pan at a point along the winch rope which lies closer to the towing vehicle than the portion of the winch rope cooperating with said log clamping device.

3. A log skidding device as claimed in claim 2, comprising spring means (12) connected between said skid pan (1) and said winch rope (10) at a point along the rope which is more removed from the towing vehicle than the part of the rope cooperating with said rope locking device (13, 14).

4. A log skidding device as claimed in claim 2, wherein said rope locking device (13, 14) is provided with control means (16) operable from the towing vehicle.

5. A log skidding device as claimed in claim 1, wherein said log clamping device includes a horizontal substantially transverse clamping jaw (4) mounted at the outer ends of two arms (5) located at each one side of the skid pan and pivoted on the skid pan so as to be swingable in vertical direction.

6. A log skidding device as claimed in claim 5, wherein a guide pulley (9) for the winch rope (10) is mounted at the rear end and at the one side of the skid pan (1) and fastening means (11) for the free end of the winch rope are mounted at the opposite side of the skid pan, guide pulleys (8) for the winch rope being mounted at the outer end of said two arms (5) supporting the clamping jaw (4).

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7. A log skidding device as claimed in claim 1, wherein said skid pan (1) is provided with a horizontal substantially transverse log bunk (2) mounted close to the bottom of the skid pan, said log bunk (2) being rotatable about its own axis and provided with an axial row of teeth (17) and coupled to said log clamping device (4, 5) so as to be rotated to a position with the said teeth facing upwards, when said log clamping device is closed, and to a position with the teeth turned downwards, when the log clamping device is open.

8. A log skidding device as claimed in claim 1, wherein said skid pan (1) is provided at its fore end with a towing ring (19) by means of which the skid pan can be hung on a tow hook on the towing vehicle in a position raised from the ground.

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