

June 7, 1955

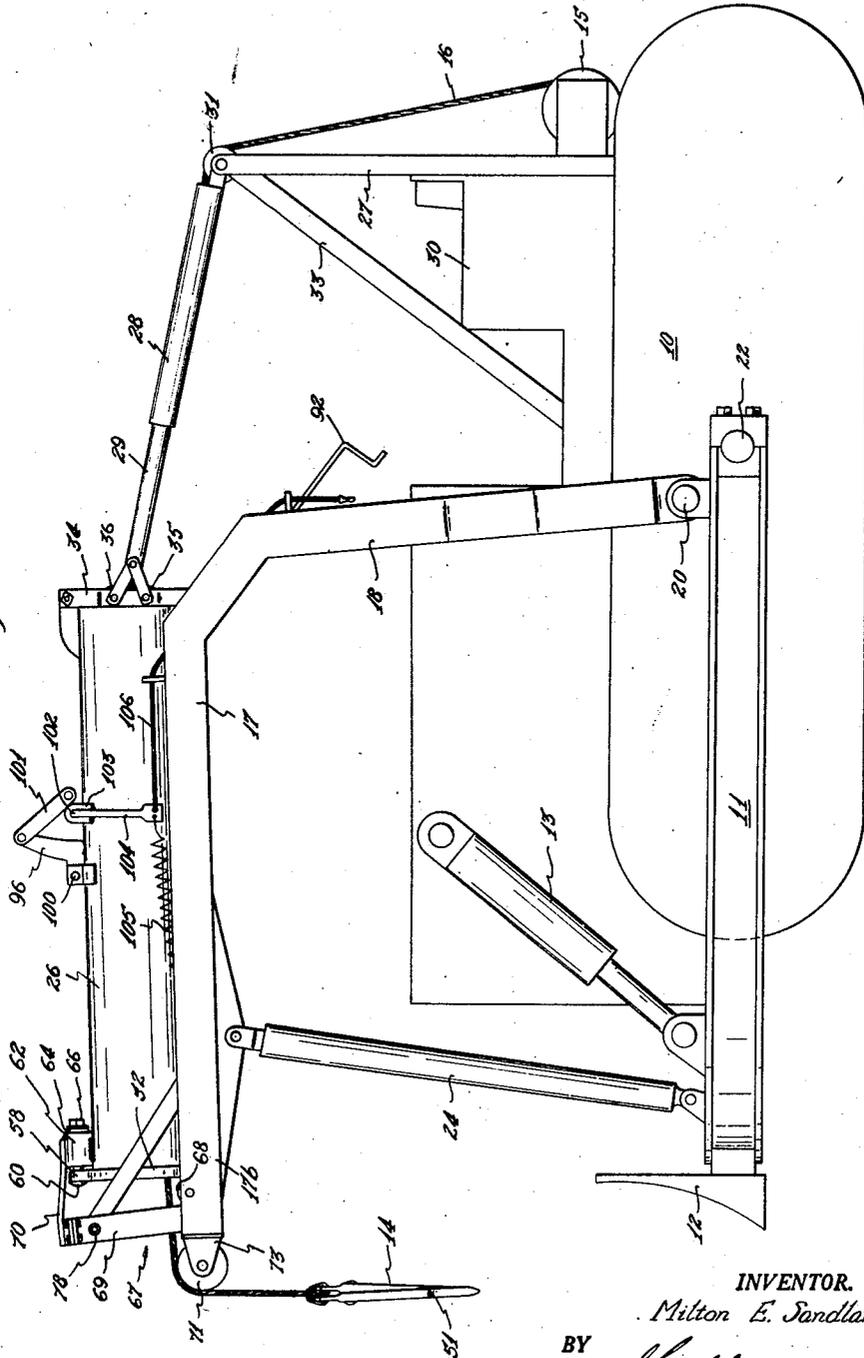
M. E. SANDLAND
LOG YARDER

2,710,167

Filed Jan. 16, 1953

6 Sheets-Sheet 1

Fig. 1.



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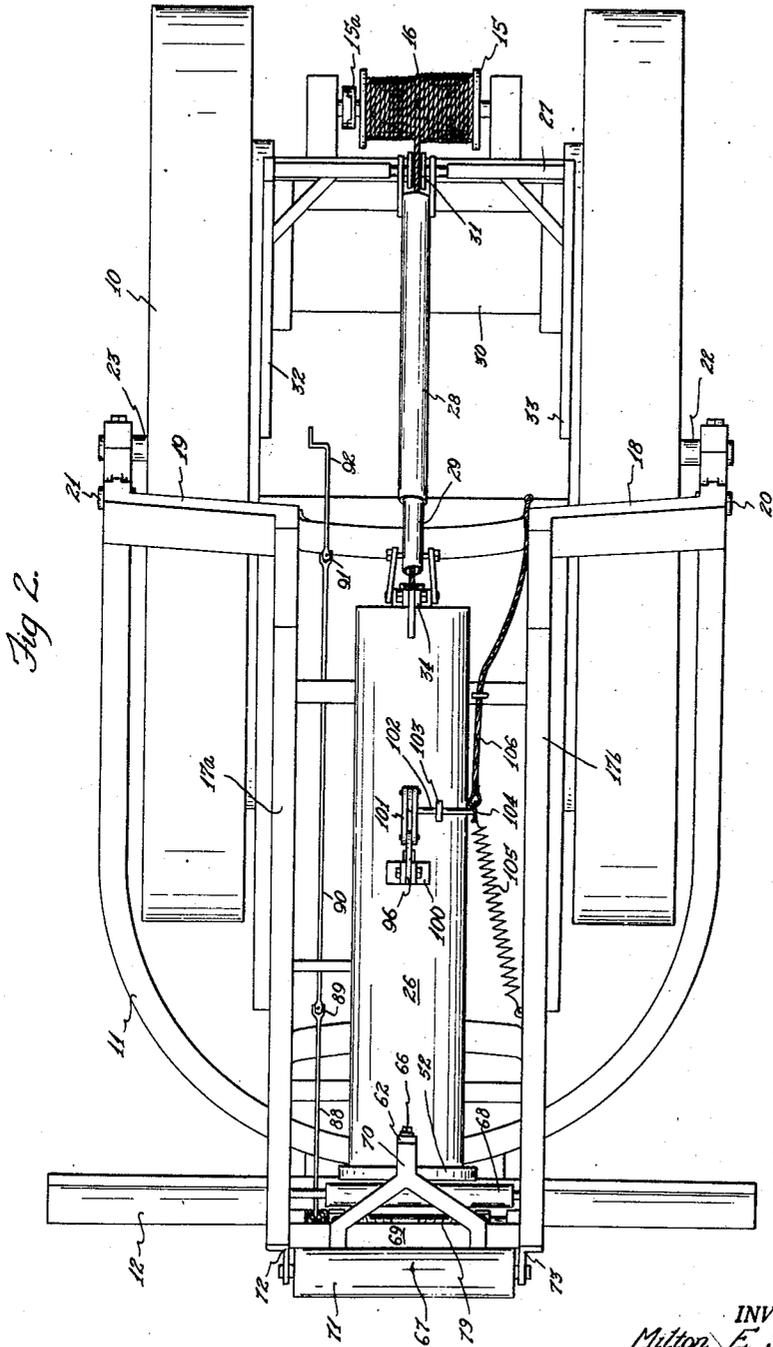
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LOG YARDER

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6 Sheets-Sheet 2



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LOG YARDER

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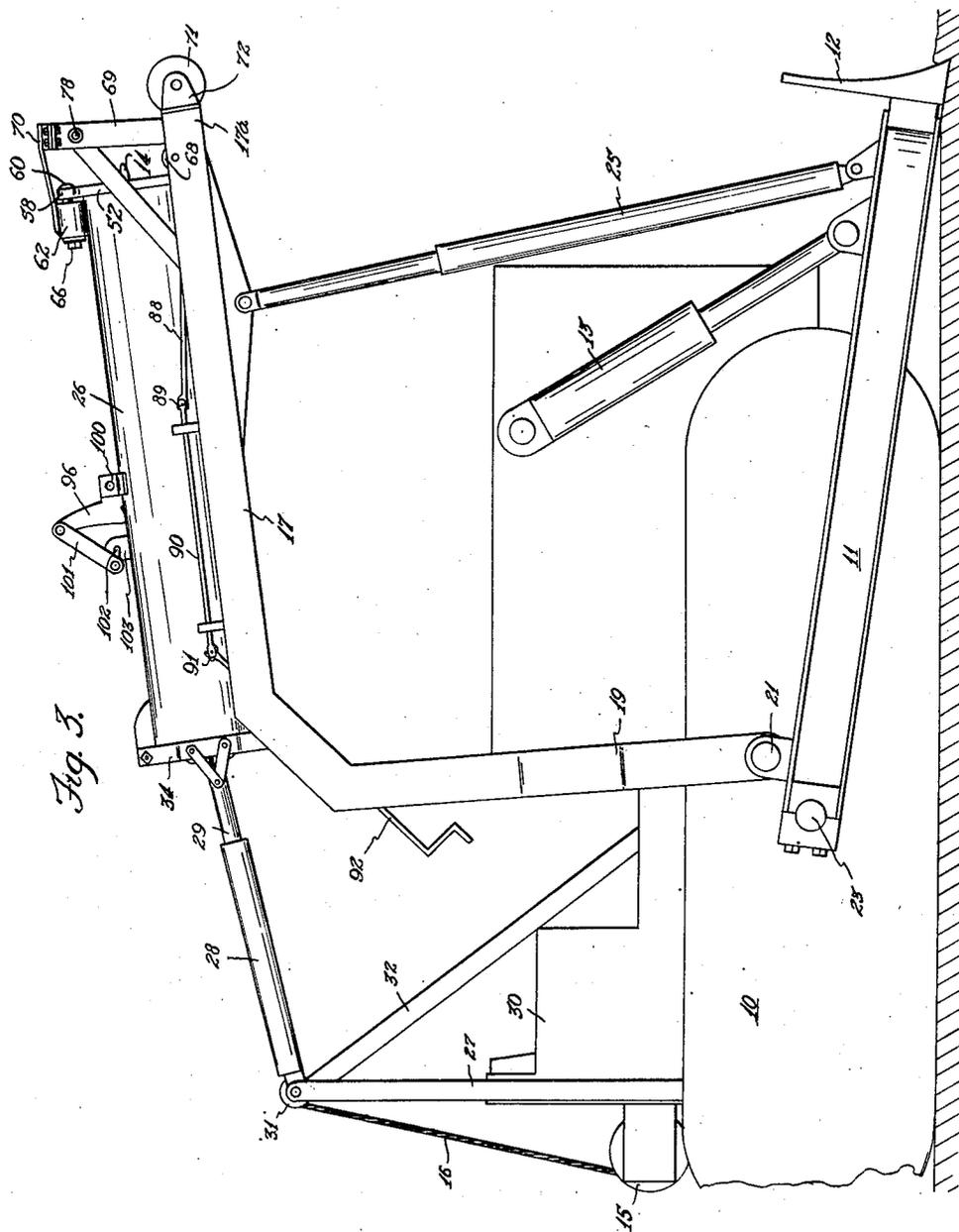


Fig. 3.

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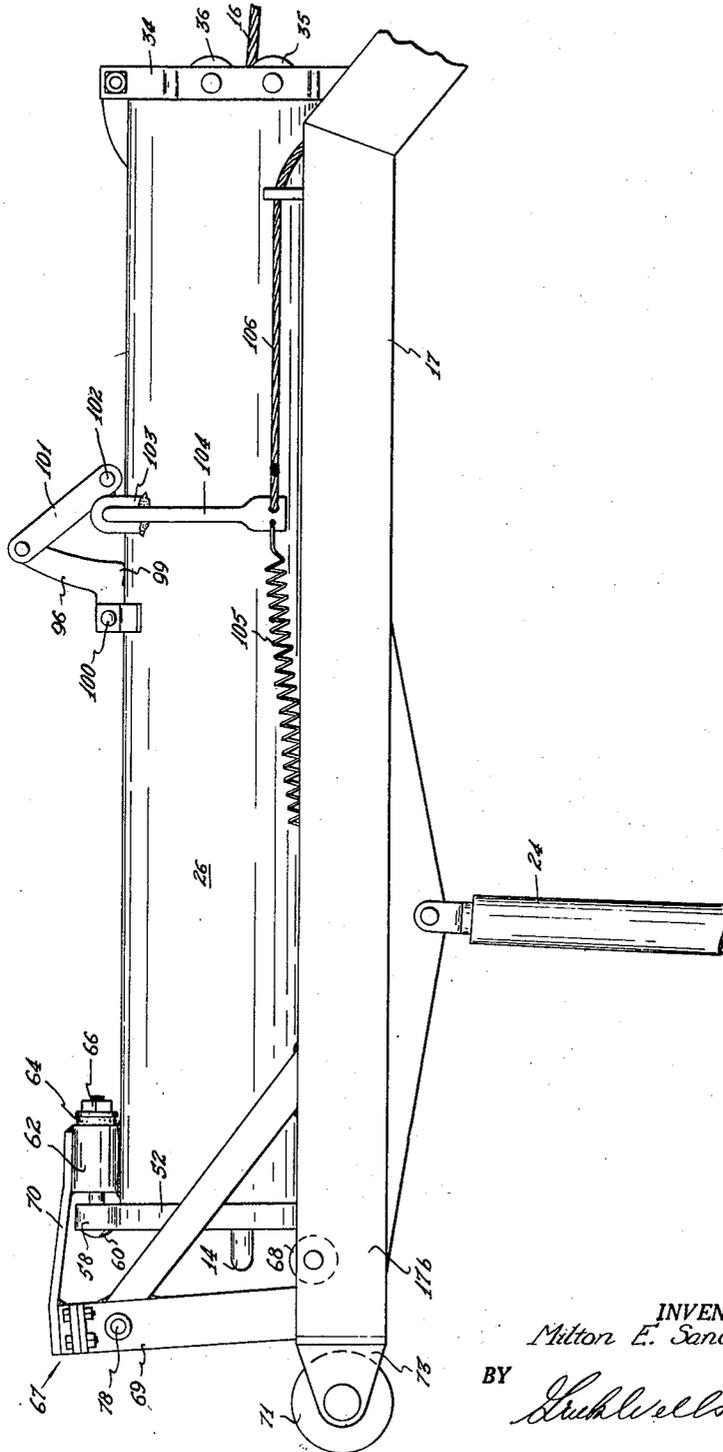
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LOG YARDER

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Fig. 4.



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LOG YARDER

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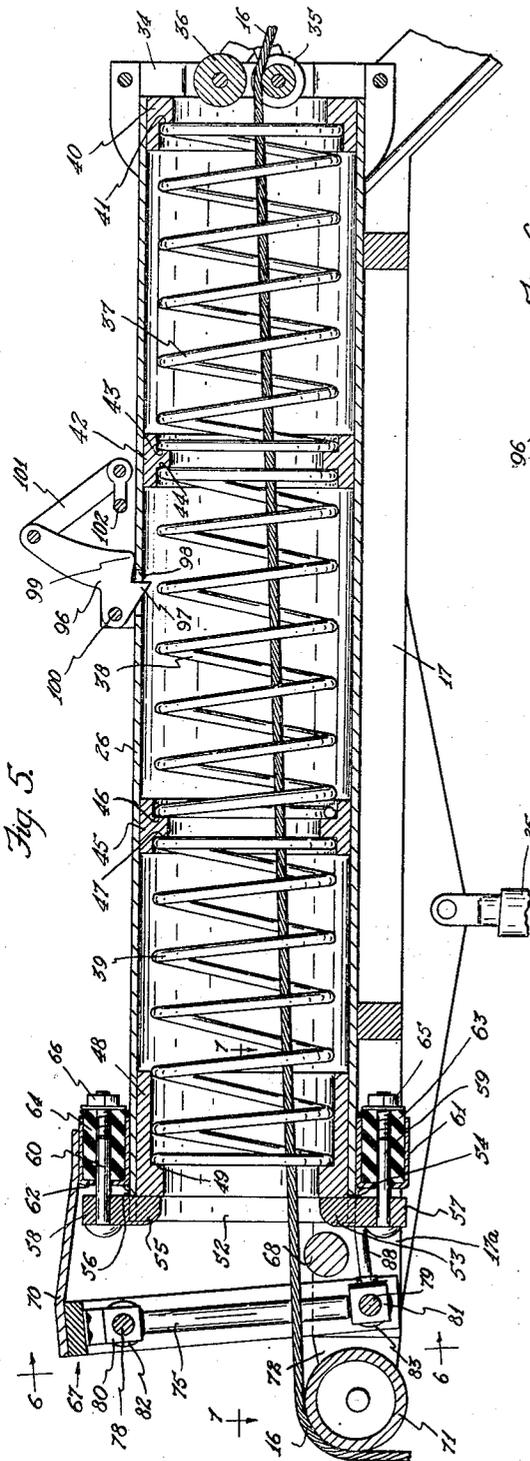


Fig. 5.

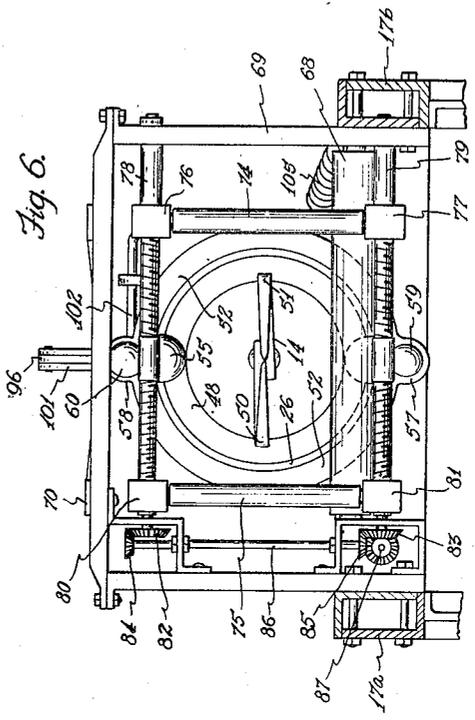


Fig. 6.

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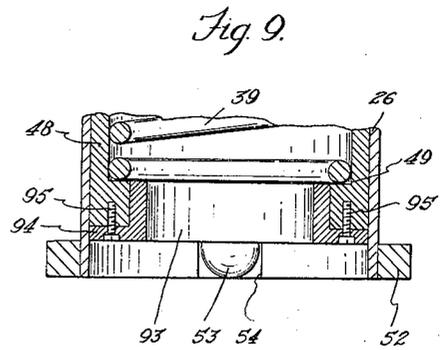
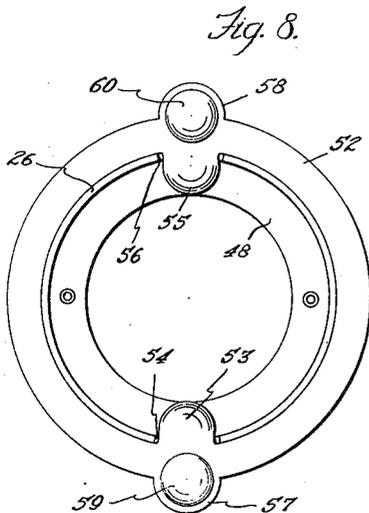
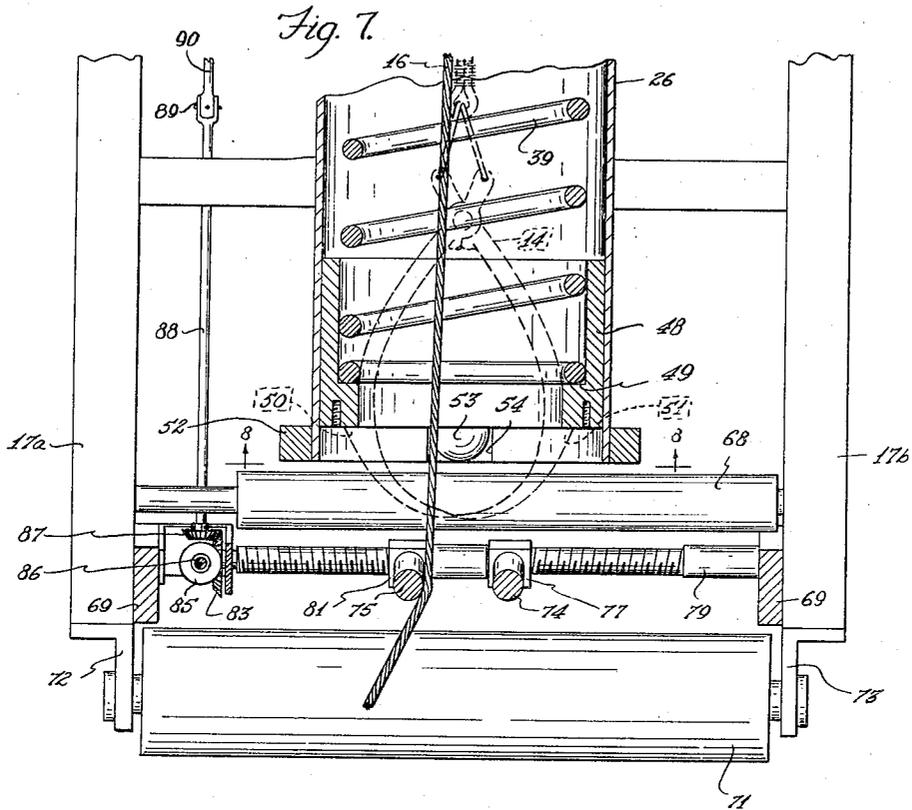
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LOG YARDER

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6 Sheets-Sheet 6



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LOG YARDER

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Application January 16, 1953, Serial No. 331,650

8 Claims. (Cl. 254—147)

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The present invention relates to improvements in a log yarder. A log yarder is a device which is used in the woods to gather the logs from the area in which the trees fall to a convenient point where they are loaded and transported away. The gathering or yarding of the logs is accomplished by taking the tongs with a cable attached for securing the log, out to where the log lies, fastening the tongs to the log and then using the cable to draw the log into a loading spot. A powered vehicle, such as a crawler type tractor equipped with a winch, is used for this purpose. The laborious work of hauling the tongs and the cable out to the log is one of the difficulties of this type of operation.

It is the purpose of the present invention to provide a log yarder which is so constructed that it can throw the tongs with the cable attached, in any desired direction from the loading spot, out into the woods with the cable attached, and then after the tongs are attached to a log, bring the log back to the loading spot.

It is also a purpose of my invention to provide a tong throwing device which comprises a compressible coil spring unit, a guide for the unit, operable to cause the coil spring unit to expand along a fixed path, cable supports at the end of the guide and means to open and close one of the cable supports so that the tongs may enter the guide for the coil spring unit.

It is also a purpose of the invention to provide a long yarding device which comprises a combination tong throwing and cable guide tubular member, a compressible coil spring unit in the member, together with tongs and a cable, the tongs having shoulders thereon and the coil spring unit having a front ring engaged by the shoulders so that the cable may be used to compress the coil spring unit, the tongs being guided by the tubular member in expansion of the coil spring.

It is also a purpose of the invention to provide in a device of the character described, a tong throwing unit comprising a tubular member having cable guides at its ends, the guide at the forward end being expansible and contractable to pass the tongs into the tubular member and to close on the cable for guiding it centrally of the tubular member when the cable is drawing the tongs and a log to which they are attached, toward the tubular member.

With my invention the same power mechanism used for hauling in the log is also utilized to supply the force necessary to carry the tongs and cable out to where the logs lie in the woods. The present practice of logging in the areas with which I am familiar, is by building rough access roads into the wooded areas along substantially parallel paths. The trees are cut between the access roads and then dragged out by cables to the access roads where they are loaded onto vehicles for transportation. My invention is embodied in a machine which is applied to the usual bulldozer so that the blade mounting frame of the bulldozer forms the supporting and directing means for throwing the tongs out to the logs. The construction is such that the weight of the bulldozer is used as a counterweight to oppose the pull of the log in the most effective manner.

The nature and advantages of my invention will be more apparent from the following description and the accompanying drawings wherein a preferred form of the invention is shown. It should be understood, however, that the drawings and description are illustrative only and are not intended to limit the invention except insofar as it is limited by the claims.

In the drawings:

Figure 1 is a view in side elevation of a machine embodying my invention;

Figure 2 is a top plan view of the machine;

Figure 3 is a view in side elevation showing the opposite side of the machine to that shown in Figure 1 and showing the parts in changed position;

Figure 4 is an enlarged view in side elevation of the tong throwing device which forms part of the machine;

Figure 5 is a longitudinal sectional view through the tong throwing device;

Figure 6 is a sectional view taken on the line 6—6 of Figure 5;

Figure 7 is a fragmentary sectional view taken on the line 7—7 of Figure 5;

Figure 8 is a detailed view taken on the line 8—8 of Figure 7; and

Figure 9 is a fragmentary sectional view showing a modification of the tong throwing device to take smaller tongs.

Referring now in detail to the drawings, my invention is shown in combination with a powered type tractor 10, the details of which are indicated only diagrammatically. The tractor 10 is shown as equipped with a bulldozer frame 11 on which a blade 12 is carried. It is customary to provide machines of this character with hydraulic jacks 13 for raising and lowering the frame 11. I utilize this structure in my invention in such a fashion that the tractor device 10 furnishes the motive power for throwing out tongs 14 to the logs in the woods and pulling the logs back to the vicinity of the tractor 10. The construction also utilizes the weight of the tractor 10 as an effective counterbalance for the logs. The tractor 10 is equipped with a winch 15 connected through a clutch 15a to the motor of the tractor to wind a cable 16 on the winch and draw logs to which the tongs 14 are attached into the loading spot.

A main frame 17 is pivoted to the frame 11 by two legs 18 and 19 and pivot pins 20 and 21. This pivotal connection is adjacent to the pivots 22 and 23 which mount the frame 11 to the tractor 10. The free end of the frame 11 is provided with hydraulic jacks 24 and 25 which project upwardly and support the forward portion of the frame 17. The frame 17 and the arms 18 and 19 are rigidly connected so that the frame pivots around the pivot members 20 and 21. The hydraulic jacks 24 and 25 are pivoted to the frame 11 and to the frame 17 so that they may be used to raise and lower the forward end of the frame 17 with respect to the frame 11 as indicated by comparison with Figures 1 and 3.

The frame 17 carries a guide member 26. The cable 16 is extended up over a rear panel 27 and through two telescoped tubes 28 and 29 into the member 26. The panel 27 is immediately at the rear of the seat 30 for the driver of the tractor 10. A guide pulley 31 is provided at the top of the panel 27 and braces 32 and 33 are used with the panel 27 to provide a support to withstand the downward thrust on the pulley 31 when the cable 16 is being used to haul in a log. The front tube 29 is secured to a framework 34 on the rear end of the member 26. The frame 34 carries a guide pulley 35 for the cable 16 and a roller 36 positioned over the pulley 35 to keep the cable in the groove of the pulley 35.

The member 26 provides a housing and a support for the mechanism by which the tongs 14 on the cable 16

can be thrown out into the woods from a central location of the vehicle 10. This mechanism will now be described in detail. In order to throw the tongs and to pull the cable out with them, it is necessary to provide some means of storing a substantial amount of power and releasing it to expel the tongs. The member 26 is a tube which supports three sections 37, 38 and 39 of a coiled spring. More or fewer sections may be used as desired. A ring 40 is secured in the rear end of the member 26 and has a shoulder 41 in which one end of the spring 37 seats. A guide ring and support 42 is provided with shoulders 43 and 44 to seat the adjacent ends of the sections 37 and 38. The ring 42 is free to slide in the tubular member 26. A second guide ring 45 is provided between the spring sections 38 and 39 and has shoulders 46 and 47 in which the adjacent ends of the sections seat. The forward end of the spring section 39 seats in a third guide ring 48 against a shoulder 49. The third guide ring 48 is also slidable like the rings 42 and 45 lengthwise within the member 26. The ring 48 is adapted to be engaged by the tongs 14 which have lugs 50 and 51 on the exterior thereof for engagement with the front face of the ring 48.

At the forward end of the tubular member 26, I provide stop means to stop the ring 48. This stop means comprises an exterior ring 52 which fits over the end of the tubular member 26 and is slidable thereon. The ring 52 has a lug 53 extending upwardly from the lowermost point thereof through a recess 54 in the front end of the member 26 to engage the front face of the ring 48. A similar lug 55 extends through a recess 56 in the top of the member 26 to engage the ring 48. These lugs 53 and 55 are rounded on their outward faces so as to prevent the tongs 14 from catching on them. The ring 52 has outwardly projecting ears 57 and 58 opposite the lugs 53 and 55. These ears receive bolts 59 and 60 which extend rearwardly through cups 61 and 62 that are fixed to the member 26. The cups 61 and 62 contain resilient cylinders 63 and 64 of rubber or similar material, to act as shock absorbers to yield to the blow of the ring 48 against the lugs 55. The bolts 59 and 60 have nuts and washers indicated at 65 and 66 to secure the resilient members 63 and 64.

The tubular member 26 also has a cable and tong guide mechanism 67 at its front end. This mechanism comprises a roller 68 which is secured between the side members 17a and 17b of the frame 17. The roller 68 is journaled in the side members 17a and 17b and extends across the front of the tube 26 as illustrated clearly in Figures 5 and 7. A framework 69 is bolted to the frame members 17a and 17b and is secured to the tubular member 26 by a V-shaped brace 70. The framework 69 is tilted forward slightly with respect to a plane transverse to the tube 26. Forwardly beyond the framework 69, a large roller 71 is journaled in two brackets 72 and 73 which are provided at the front ends of the frame members 17a and 17b. The framework 69 also mounts two side guide rollers 74 and 75 so that these rollers can be moved inwardly and outwardly. The roller 74 has bearing blocks 76 and 77 at its ends which are threaded onto shafts 78 and 79. The roller 75 has bearing blocks 80 and 81 at its ends which are also threaded onto the shafts 78 and 79. The threads for the blocks 76 and 77 are reversed with respect to the threads for the blocks 80 and 81 so that if the shafts 78 and 79 are turned in one direction, the rollers 74 and 75 will approach each other and if the shafts are turned in the other direction, the rollers 74 and 75 will move away from each other.

The shafts 78 and 79 are provided with bevelled gears 82 and 83 respectively. These gears mesh with gears 84 and 85 on a vertical shaft 86 that is carried by the framework 69. The gear 83 also meshes with a gear 87 which is provided on the forward end of a shaft 88. The shaft 88 is extended rearwardly to a universal joint 89 that connects it to another shaft section 90. The shaft section

90 is connected by a universal joint 91 to a hand crank 92 which is suitably mounted on the frame 17 in position to be readily accessible to the operator on the seat 30. By rotating the hand crank 92, the operator can adjust the side guide rollers 74 and 75 from a wide open position to permit the tongs 14 to pass between them to a closed up position as shown in Figure 7 where the rollers 74 and 75 act as fairleads to direct the cable centrally through the coiled springs 37, 38 and 39 to the pulley 35.

The rollers 68 and 71 hold the cable 16 high enough to keep it from riding on the lugs 53 and 55 or the ring 48. These rollers also serve to line up the tongs as they are brought in to the ring 48 so that they will lie substantially horizontal. When they first engage the ring 48 the tongs will naturally be forced upwardly to substantially mid position of the ring 48 as they are drawn into the ring by engagement of the curved arms of the tong with the ring surface.

Whenever it is desired to use smaller tongs, the ring 48 is provided with an adapter ring 93 which is shown in Figure 9 of the drawings. The adapter ring has a flange 94 that overlies the ring 48 and is secured thereto by screws 95. With this construction it is obvious that adapter rings of suitable size can restrict the entrance to the ring 48 to fit any desired size of tongs. It is necessary that the tongs be provided with the lugs 50 and 51.

The tubular member 26 is provided with a latch 96 for latching the coil springs 37, 38 and 39 in compressed position. It is evident that by using the winch 15, the cable 16 and the tongs 14 can be made to compress the springs 37, 38 and 39 until the ring 48 moves past the latch 96. The latch is shown best in Figure 5. A finger 97 of the latch 96 will then drop in front of the ring 48 through the aperture 98 in the member 26. A shoulder 99 on the latch 96 limits the extent to which the finger 97 can extend inwardly. The latch 96 is pivoted on the member 26 by a pivot pin 100. A link 101 connects the latch 96 to a rocker arm 102 that extends through a bearing 103 on the tubular member 26 and downwardly at the side of the tubular member 26. A pull cord 106 is connected to the downwardly extending portion 104 of the rocker arm 102 for the purpose of lifting the latch 96 to release the ring 48. A spring 105 normally holds the rocker arm 102 in position to keep the latch 96 in the position shown in Figure 5. The finger 97 being pivoted by the pin 100 above the tubular member 26, has to move to the right as shown in Figure 5, as it raises to release the ring 48. This makes it necessary for the operator to actually further compress the springs 37, 38 and 39 slightly in order to release the ring 48. It is a valuable safety factor to prevent inadvertent release in throwing of the tongs. The latch 96, being on the exterior of the tubular member 26, can be checked frequently to make sure that it is in perfect operating condition and to observe the wear on the finger 97.

In operation of my log yarder to bring logs into a loading spot, the driver of the vehicle 10 first positions the vehicle so as to point the tube 26 in the direction that he wants to send the tongs 14. He then raises or lowers the frame 17 by manipulation of the hydraulic jacks 24 and the hydraulic jacks 13 if necessary, to point the tubular member 26 at the proper angle to the horizontal. The operator then uses the winch 15, powered from the vehicle 10, to pull the tongs 14 into the tubular member 26, compressing the springs 37, 38 and 39 until the finger 97 drops in front of the ring 48. He then releases the winch 15 from the power so that it is free to pay out the cable as the tongs are thrown. The operator then pulls the cord 106, first making sure that the rollers 74 and 75 are wide open as shown in Figure 6.

When the latch finger 97 releases the ring 48, the springs 37, 38 and 39 propel the ring 48 forwardly. This starts the winch 15 to turning so that by the time the ring 48 reaches its forward limit of travel, the inertia 75 of the winch is substantially overcome. The tongs 14

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are propelled forwardly out into the woods toward the log to be brought in. The ring 48 is stopped by engagement with the lugs 53 and 55. The man who is setting the tongs in the logs, picks up the tongs and secures them to the desired log. While he is doing this, the operator on the vehicle 10 closes the rollers 74 and 75 to fairlead position shown in Figure 7 of the drawings and lowers the frame 17 down far enough that it will be pointed more nearly to the log to be hauled in. The frame 11 is lowered by the jacks 13 so that the blade 12 rests on the ground. The vehicle operator then connects the power to the winch 15 to bring the log into the loading position. By again lifting the frame 11, the vehicle operator can turn the vehicle to any desired position or back it up to bring the log alongside others to be loaded for transportation. The tongs are released and the vehicle can then be positioned again for throwing the tongs out into the woods again.

With this device it is possible to throw the tongs out into the woods a distance upwards of 100 feet so that a strip of land at least 200 feet wide can be cleared from a single access road without the necessity of the tongs and cable being dragged manually through the woods.

It is believed that the nature and advantages of my invention will be clear from the foregoing description.

Having thus described my invention, I claim:

1. A log yarder attachment for self propelled vehicles comprising in combination a frame mounted on and projecting forwardly above the vehicle, a tubular guide on the frame aligned longitudinally with the vehicle, coiled spring means in said guide, a power driven winch on the vehicle, a cable wound on the winch and extending upwardly to and into said guide at the rear end thereof, tongs on the free end of the cable, a tong stop ring slidably mounted in the tube in front of said spring means and having a seat therein for the forward end of said spring means so that the spring means can be compressed in the guide by a pull on the cable by said winch, and manually releasable latch means in said guide for engaging the ring and holding it against forward movement in the guide.

2. A log yarder attachment for a bulldozer having a forwardly extending blade frame, comprising a cable guiding tube having compressible coiled spring means therein, cable guides at the ends of said tube for guiding a cable through it and through the coiled spring means, rear support means for said tube pivoted on the rear portion of the blade frame, an extensible front support at the front end of the blade frame extending upwardly to and supporting the front portion of the tube, a power winch on the bulldozer, a cable wound thereon and extending through the coiled spring means, log tongs on the free end of the cable, a tongs stop ring on the front end of said coiled spring means and slidable in the tube, and latch means intermediate the ends of the tube for engaging the tongs stop ring to hold the coiled spring means compressed.

3. A log yarder comprising in combination, a supporting vehicle, a support frame pivoted to the vehicle at the sides thereof and extending forwardly beyond the vehicle, means on the vehicle for moving said frame between a position with its front end resting on the ground and a position with its front end raised above the ground, a tubular member above said frame and vehicle, support means for said tubular member including an extensible leg between the frame and the tubular member operable to raise and lower the front end of said tubular member with respect to the frame, a coiled spring in said member, a cable extending through the member and spring, a winch on said vehicle on which the cable is wound, tongs on the free end of the cable, a tongs stop ring in said member in which the front end of the spring seats, and the tongs having means thereon engaging said ring to pull the ring rearwardly in the tubular member and compress the spring when the cable is wound on the winch.

4. A log yarder comprising in combination, a supporting vehicle, a support frame pivoted to the vehicle at the sides thereof and extending forwardly beyond the vehicle, means on the vehicle for moving said frame between a position with its front end resting on the ground and a position with its front end raised above the ground, a tubular member above said frame and vehicle, support means for said tubular member including an extensible leg between the frame and the tubular member operable to raise and lower the front end of said tubular member with respect to the frame, a coiled spring in said member, a cable extending through the member and spring, rotatable guides at the ends of said tubular member for keeping the cable out of contact with the member and spring, a winch on said vehicle on which the cable is wound, tongs on the free end of the cable, a tongs stop ring in said member in which the front end of the spring seats, and the tongs having means thereon engaging said ring to pull the ring rearwardly in the tubular member and compress the spring when the cable is wound on the winch.

5. In a log yarder, a coiled spring, a guide member for said spring along which it may expand and contract in a straight line, a cable extending through the spring, winding mechanism secured to one end of the cable and operable to draw the cable rearwardly through the spring, tongs attached to the other end of the cable, cable guides at the ends of said guide member, the guide at the front, tong receiving end of said guide member including members that open up to pass the tongs to said spring, the spring having a front ring and the tongs having lugs engaging said ring whereby the tongs and cable cooperate to compress the spring by actuation of the winding mechanism to draw the cable through the spring.

6. In a log yarder, a coiled spring, a guide member for said spring along which it may expand and contract in a straight line, a cable extending through the spring, winding mechanism secured to one end of the cable and operable to draw the cable rearwardly through the spring, tongs attached to the other end of the cable, cable guides at the ends of said guide member, the guide at the front, tong receiving end of said guide member including members that open up to pass the tongs to said spring, the spring having a front ring and the tongs having lugs engaging said ring whereby the tongs and cable cooperate to compress the spring by actuation of the winding mechanism to draw the cable through the spring, and a manually releasable latch carried by said guide member for holding the spring compressed.

7. In a log yarder, a tubular member, cable supporting rollers at the ends thereof, a cable extending through the member and over said rollers, a coiled spring in said member, the cable extending through the spring, winding mechanism secured to one end of the cable and operable to draw the cable rearwardly through the spring, a fixed spring seating ring at the rear end of said member, a spring seating ring at the front end of said spring slidable in said member toward the fixed ring to compress the spring, tongs on said cable having means thereon to engage the front face of the slidable ring and move the slidable ring toward the fixed ring by actuation of the winding mechanism to draw the cable through the spring, and a manually releasable latch in the tubular member adapted to drop in front of the slidable ring when it is drawn back toward the fixed ring past the latch by the cable and tongs.

8. In a log yarder, a tubular member, cable supporting rollers at the ends thereof, a cable extending through the member and over said rollers, a coiled spring in said member, the cable extending through the spring, winding mechanism secured to one end of the cable and operable to draw the cable rearwardly through the spring, a fixed spring seating ring at the rear end of said member, a spring seating ring at the front end of said spring slidable in said member toward the fixed ring to compress the spring, a yielding stop at the front end of said tubular

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member against which the spring presses the slidable ring, tongs on said cable having means thereon to engage the front face of the slidable ring and move the slidable ring toward the fixed ring by actuation of the winding mechanism to draw the cable through the spring, and a manually releasable latch in the tubular member adapted to drop in front of the slidable ring when it is drawn back toward the fixed ring past the latch by the cable and tongs.

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