Aug. 11, 1942. R. S. LANGDON 2,292,882

HINGED REACH YARDER

Filed June 3, 1941 2 Sheets-Sheet 1

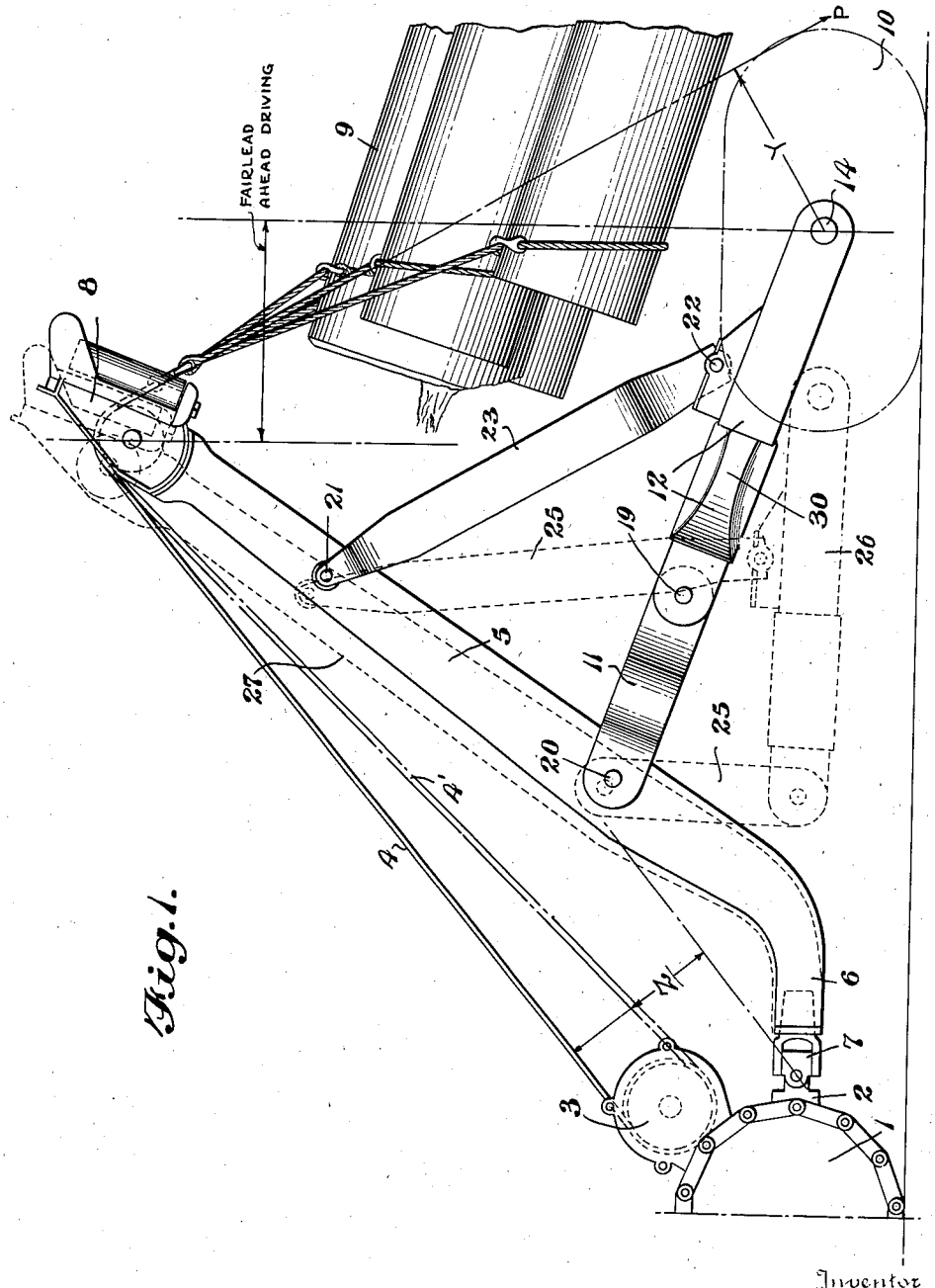


Fig. 1.

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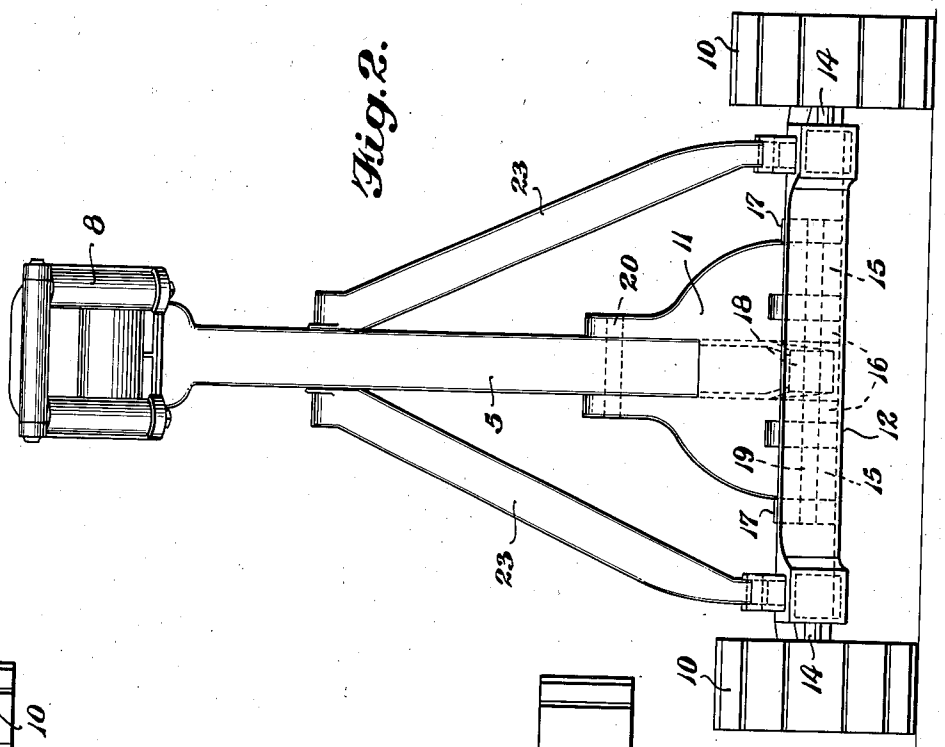
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Fig. 2.



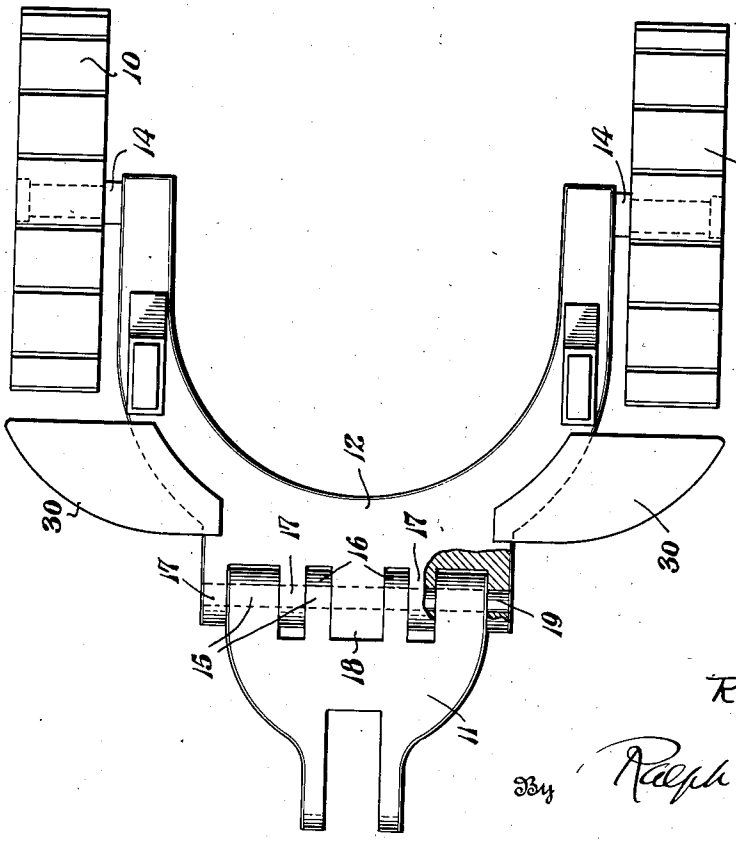


Fig. 3.

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2,292,882

HINGED REACH YARDER

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Application June 3, 1941, Serial No. 396,470

11 Claims. (Cl. 214—65.3)

This invention relates to improvements in logging yarders designed for operation in conjunction with a source of power, such as a tractor, for the purpose of bunching and moving logs and analogous material.

The object of my present invention is to add certain features to the structures disclosed in my prior Patents Nos. 1,918,409 and 2,035,134, whereby injury to the logs being handled is eliminated, a more positive lifting action of the logs is brought about with less power, and maneuvering of the yarder during backing and turning in inconvenient and inaccessible places is materially facilitated.

The main object of the invention is to provide a yarder having a hinged reach.

Another object of the invention is to provide a reach which is capable of collapsing intermediate its extremities during that period in which the logs or other articles are being elevated to the boom, whereby a relative movement is present between the wheels or endless tractor belts carried by the yarder and the contacting or engaging load to facilitate the vertical movement of the load.

More specifically the present application comprehends the use of a sectional reach capable of a folding movement so that when the logs are being gathered into loaded position and are skidded into engagement with the wheels or tracks, the latter will turn and move forward to perform a lifting function, thus providing a rolling contact between the logs and the wheels or tracks in lieu of the conventional friction contact as when the wheels are stationary.

A further object of this invention is to provide means for eliminating friction between logs and wheels or tracks of a yarder during the loading of the logs, thus avoiding injury to the log end portions.

A further object of the invention is to improve the balance of the tractor.

Another object of the invention is to decrease the weight taken from the tractor and transferred to the yarder axle thereby leaving more weight on the tractor tracks to pull the decreased yarder load.

Another object resides in so arranging the strut and so connecting it to the boom and the reach as to raise the fairlead and logs when the tracks are moved forward, the rising movement of the fairlead being increased at the extreme back part of the track motion whereby a cushioning of the parts is provided.

A further object resides in positioning of the struts forward of the yarder axle to improve clearance in handling of the logs.

Other features will more clearly hereinafter appear by reference to the accompanying drawings, and claims forming a part of this specification, in which similar reference characters indicate corresponding parts throughout the several views, in which

Figure 1 is a side elevation of an assembly showing the reach collapsed as during a loading operation;

Fig. 2 is an end view;

Fig. 3 is a top plan view.

The present yarder is illustrated in connection with the representation of the extremity of a tractor 1, the latter being provided with coupling section 2 and hoist mechanism 3 from which the cable 4 and 4' extend. The cable 4 shown in full lines represents an over wound connection, while the cable 4' shown in dotted lines represents an under wound connection. Either type of hoist wind may be utilized in connection with the present yarder.

The yarder includes the boom 5 formed with the horizontally extending lower extremity 6 connected to the tractor coupling section 2 by means of the coupling section 7. The upper end of the boom is provided with the fairlead 8 over which either the cable 4 and 4' travels, the fairlead having fore and aft movement by virtue of the universal connection 2—7 heretofore mentioned. The end of the cable is connected to the load illustrated as comprising a plurality of logs 9.

The supporting tracks or wheels 10 are illustrated and these wheels are carried by the hinged reach member. The hinged reach includes forward section 11 and rear U-shaped section 12, the extremities of the U-shaped section being connected by suitable axles 14 to the tractor wheels 10 in the usual manner.

The type of hinge connecting the two sections of the reach member may be varied, it being essential however, that the hinge structure be extremely sturdy and of such a character as to eliminate the possibility of undesirable clearances which might prove detrimental to the maneuverability of the device under extreme loads. In the illustration shown the hinges are formed of a multiplicity of inter-leaved fingers, the outer fingers 15 carried by the forward section portion 11 of the reach section being substantially twice the thickness of the inner leaves 16 carried by the same section. The inter-engaging fingers of the hinge section carried by the rear portion 12 of the reach are of course alter-

nately arranged, the fingers 17 being of uniform width or thickness while the center extension 18 is relatively thicker and corresponds substantially to the fingers 15 of the front reach section. The pin 19 extends through registering openings formed in the inter-leaved fingers of the hinge section and this pin may be locked in by any suitable means. Obviously it is essential that the pin be of sufficient diameter to readily accommodate any loads, strains or stresses to which the parts are applied. The front end of the reach is pivoted to the boom by connecting hinge pin 20 in the usual manner. The connection 20 between the forward end of the reach and the boom and the connections 21 and 22 between the extremities of the strut arms 23 and the reach and boom may be adjustable in the manner shown and described in my prior patents and applications.

In use it will be obvious that two results are accomplished by the construction shown and described. In the first place when raising the logs into hauling position, which position is adjacent to the fairlead the amount of weight stolen from the tractor is materially lessened, and in the second place because of the elimination of frictional contact between the log extremities and the tracks or wheels the raising of the logs is practically without injury. It will be obvious that when logs are being gathered into loaded position the wheels 10 are positioned at their extreme far position with respect to the tractor, but as the logs are skidded on the ground preparatory to their hoisting to the fairlead they necessarily strike the wheels or tracks. The lifting operation of the logs by virtue of the cable to which they are attached will cause the wheels to move forward, that is towards the tractor, this forward movement producing a lifting action of the logs and permitting the logs to have a rolling contact rather than a sliding frictional contact with the wheels or tracks as would be the case should the wheels be stationary. It therefore follows that due to the relative movement of parts the force necessary to raise the load is materially reduced and the splintering of the extremities of the logs is eliminated and material loss from this damage avoided. Referring to Fig. 1 it will be seen that reference character 25 indicates the position of the strut when the wheels 10 have been moved forward due to the log lifting operation. In this same figure reference characters 25 and 26 show in dotted lines the position of the reach after it has folded on the pintle 19. Upon forward movement of the tractor and after the loading operation heretofore described, the fairlead travels forward as shown in dotted lines and indicated by reference character 27, this forward movement continuing until the reach is straightened out and the load is brought directly over the wheels 10.

By the use of the hinged reach forming the main feature of the present invention it will be apparent that a yarder and tractor assembly has increased capacities insofar as maneuvering in restricted areas is concerned, in that the yarder is capable of being materially shortened during a backing or turning operation. The extent of movement between the wheels 10 and the coupler 2—7 will be determined by the linkage of the reach structure. It will be apparent that linkage could be provided which would permit maximum relative movement between these parts or it is possible that this movement can be limited materially by proper construction of the reach linkage. The invention could perhaps be carried further by multiplying the linkage and providing stops or springs for retarding the movement of certain links except upon maximum use or other circumstances requiring their use. In the present development it may be essential to provide stops between the moving parts and springs or buffers to ease the operation of these parts. A cushioning action is inherent in the present structure inasmuch as the arrangement of parts provides for a sharp rise in the fairlead and load at the extreme back part of the track motion.

Thus it will be seen that the assembly which includes the hinged reach provides many desirable features, among which is the rolling action between the end of the log or logs and the track, tire, or wheel, when the log is raised to carrying position. The term tire is utilized here inasmuch as the present development would indicate that the contact of the log with the track or wheel is of such a character as to permit the use of a solid or resilient tire. In addition the strut is so constructed and arranged with relation to the reach and boom that the fairlead and logs or other load will raise when the track is moved forward. The forward movement of the fairlead is materially increased at the extreme back part of the track motion and this inherently results in the cushioning of the moving parts. The struts are further arranged forward of the yarder axle which adds materially to the clearance for the logs forming the load. Further operation of the device without injury to the parts is provided for by the use of the fenders 30 on the hinged reach section. Obviously from the foregoing the normal action during backing results in the shortening of the yarder structure while this same yarder structure is lengthened and thus stability is added during forward movement.

I claim:

1. A logging apparatus comprising in combination, a power actuated tractor carrying cable actuating mechanism, a boom having a fairlead at its rear end for movement of said cable, a pair of spaced wheels, a reach member formed of hinged sections connecting the spaced wheels and said boom to permit movement of said wheels toward said tractor, a strut between the boom and the reach, and means connecting the boom with the tractor to permit its forward and rearward movement with relation thereto.

2. In a yarder including a boom, a pair of spaced wheels and axles therefor, a reach member connecting said boom and spaced wheels, said reach member including U-shaped rearwardly extending arms having their extremities connected to said axles, the front end of said reach including a hinged section adapted for downward swinging movement upon forward shifting of said wheels, and a strut interposed between said reach and said boom.

3. A logging apparatus comprising in combination, a power actuated tractor carrying cable actuating mechanism, a yarder structure including a boom having its forward end hingedly connected to said tractor, a fairlead at the rear end of said boom for movement of said cable, a pair of spaced wheels, a hinged reach interposed between said wheels and said boom, said reach being normally extended during forward movement of said tractor and lying in a plane intersecting a plane extending through the boom connection with the tractor and the axis of said wheels, and a strut between the boom and the reach.

4. A logging apparatus comprising in combina-

tion, a power actuated tractor carrying cable actuating mechanism, a boom pivotally connected at its front end to said tractor and having a fairlead at its rear end, a pair of spaced wheels and axles, a hinged reach connecting said axles and said boom, the connection of said reach with said boom being substantially above a horizontal plane intersecting said axles, and a strut between said reach and said boom.

5. A logging apparatus comprising in combination, a power actuated tractor carrying cable actuating mechanism, a boom pivotally connected at its front end to the tractor and a fairlead at the other end for movement of said cable, a pair of spaced wheels, a hinged reach normally positioning said wheels rearward of said fairlead and connecting the same to said boom, said wheels being capable of forward shifting movement during loading operation from frictional contact with the load and being movable to normal position rearward of the fairlead upon forward movement of the tractor.

6. In combination with a tractor provided with a coupling section and a cable hoist mechanism, a boom member including an angularly positioned body portion and a substantially horizontally extending forward portion provided with a coupling section for connection with the coupling section of the tractor, a fairlead at the upper rear end portion of said boom, spaced wheel elements, a reach having spaced rear end portions for connection with the wheel elements, the front end portion of the reach being connected to the boom member in a manner to permit the wheels to move forwardly in the direction of the reach during loading operation, and a strut member interposed between the reach and the boom member and being so constructed and arranged that it will cause a sharp rise to the fairlead and load in the extreme rearward movement of the wheels whereby a cushioning of the parts is accomplished.

7. In a yarder including a boom for pivotal connection with a tractor, wheel members, a reach hinged intermediate its length and connected to the boom and wheel members, and fenders carried by the reach.

8. The substance of claim 7 characterized in that a strut is interposed between the reach and boom and is so constructed and arranged as to cause a movement of the boom comparable with the position of the load.

9. A logging trailer comprising in combination, a tractor, a boom, said boom being connected to said tractor at one end and having a guide member at its free end to receive a load supporting cable, a wheel member including an axle, and a reach interposed between the boom and axle for transmitting tractive forces from said tractor to said wheel, said reach including a yoke member connected to said wheel and a link hinged to said boom and said yoke.

10. A logging trailer comprising in combination, a tractor, a boom, said boom being connected to said tractor at one end and having a guide member at its free end to receive a load supporting cable, a wheel member including an axle, and a reach interposed between the boom and axle for transmitting tractive forces from said tractor to said wheel, said reach including a yoke member connected to said wheel and a link hinged to said boom and said yoke.

11. In combination, a tractor, a boom, said boom being swivelled at one end to said tractor and having a cable guideway at its free end, a hoist mechanism carried by said tractor and including a cable, said cable engaging the guideway at the free end of said boom and forming a load supporting member, a ground engaging wheel member, a reach for transmitting draft forces from the tractor to said wheel member, said reach being formed of relatively movable sections whereby said wheel may under urge of a manipulated load on said cable move towards said tractor to provide an upwardly moving non-friction surface to facilitate load adjustment, and a strut pivoted at its extremity to said reach and boom at points intermediate their length.

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