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C. W. RUSSELL.
LOG SKIDDING AND LOADING APPARATUS.
APPLICATION FILED APR. 21, 1910.

Patented Mar. 7, 1911.

3 SHEETS-SHEET 1.

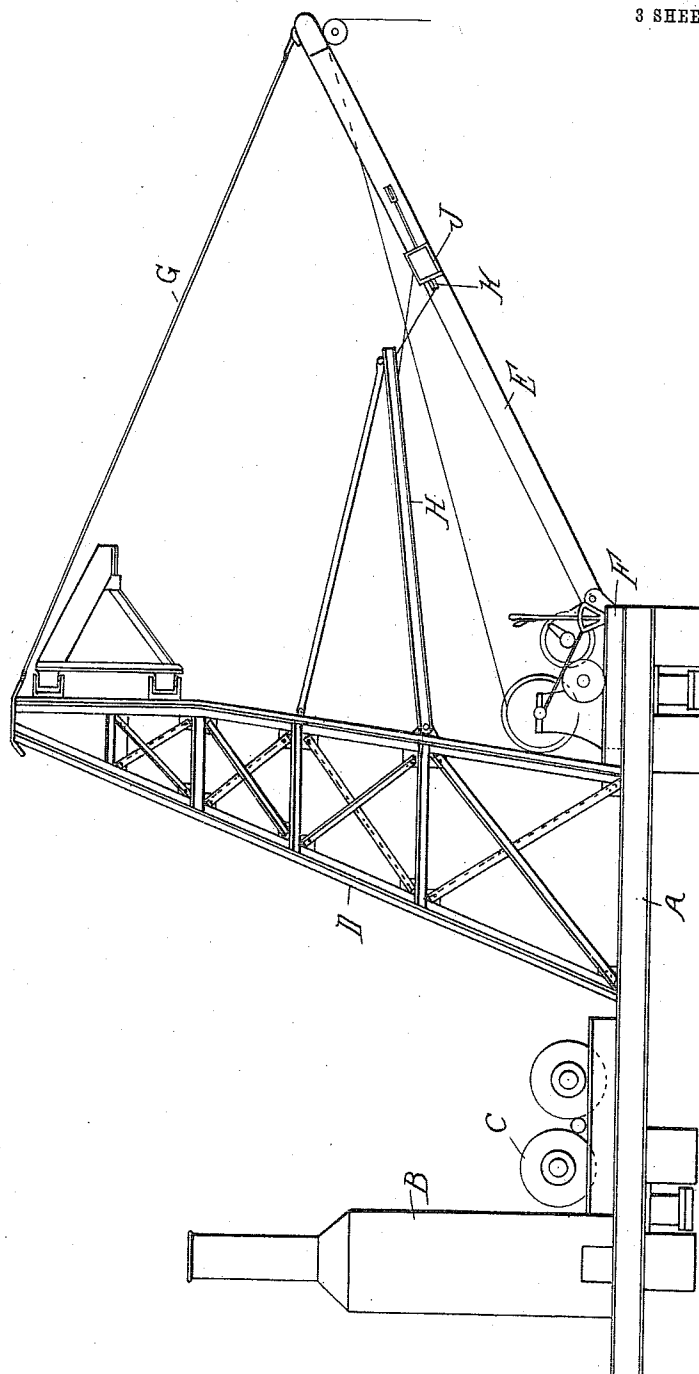


Fig. 1.

Witnesses

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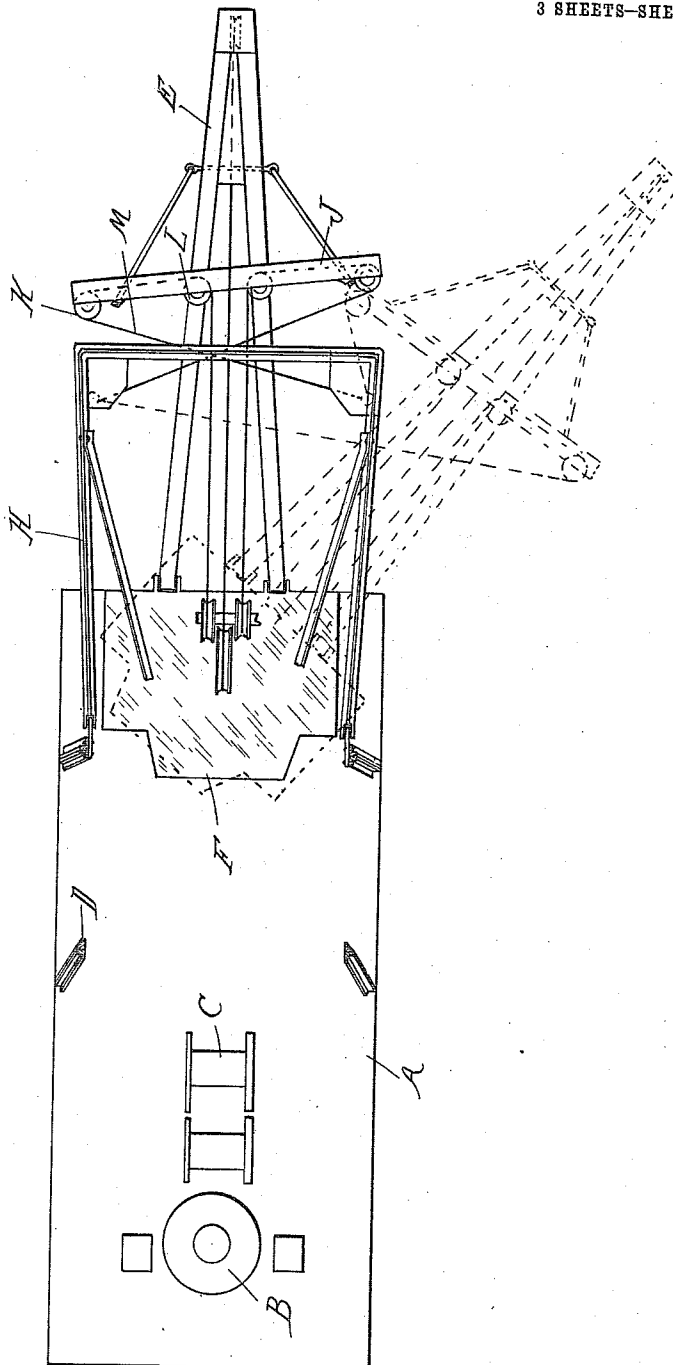
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3 SHEETS—SHEET 2.

Fig. 2.



Witnesses

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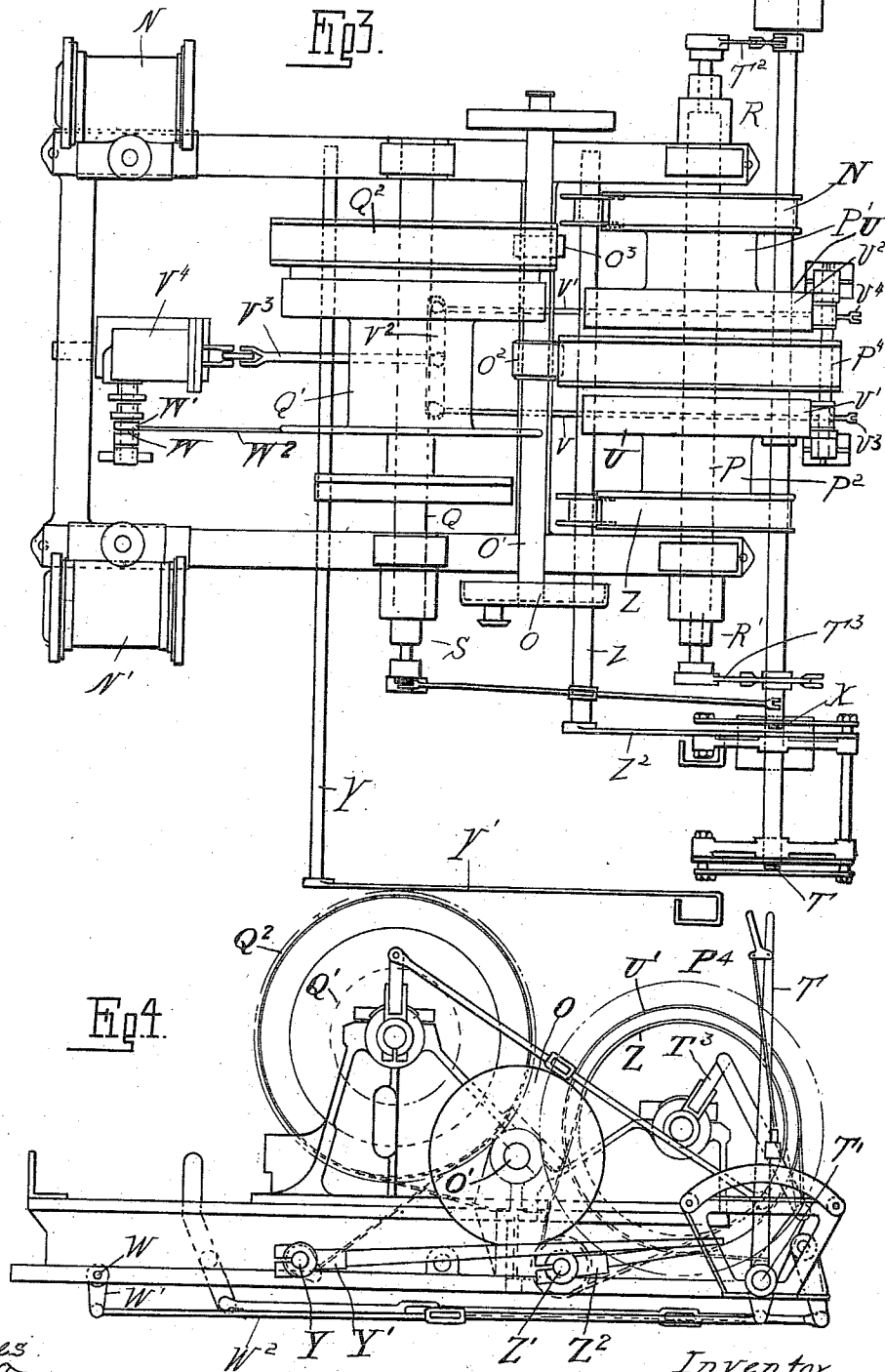
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Witnesses
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UNITED STATES PATENT OFFICE.

CLINTON W. RUSSELL, OF DETROIT, MICHIGAN.

LOG SKIDDING AND LOADING APPARATUS.

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Specification of Letters Patent.

Patented Mar. 7, 1911.

Application filed April 21, 1910. Serial No. 556,828.

To all whom it may concern:

Be it known that I, CLINTON W. RUSSELL, a citizen of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Log Skidding and Loading Apparatus, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to log skidding and loading apparatus, and particularly to the construction of a swinging boom and means for operating and controlling the same, as hereinafter set forth.

In the drawings—Figure 1 is a side elevation of the apparatus; Fig. 2 is a plan view; Fig. 3 is an enlarged plan of the mechanism on the turntable for controlling the swinging boom; and Fig. 4 is a side elevation thereof with certain parts of the mechanism omitted.

In the construction of logging apparatus, a swinging boom is commonly used for loading logs upon cars. This boom is generally mounted upon a turntable with the hoisting apparatus, and is swung by either directly actuating the turntable by means of a circular rack and pinion, a bull wheel and wire ropes; or by the use of lines operated by drums or the hoisting engine passing over sheaves made fast to the boom near the outer end and secured to some convenient object on each side of the machine. The first two methods are objectionable on account of the great length of the boom and consequent excessive strains when the power to swing is applied directly to the turntable. The third method is objectionable on account of the interference of the boom swinging lines and skidding lines, the time required to secure the swinging lines, and because there is no means contained within the turntable or boom for holding the latter in a central position when the machine is being moved.

It is the object of the present invention to avoid the use of swinging lines that are attached to objects not part of the machinery, to provide means for swinging the boom without throwing stress upon the turntable, and for securely locking the boom in a central position when the machine is being moved. To this end, I have provided a forwardly-extending frame rigidly mounted upon the main frame or supporting base, and extending above the boom at a point

considerably in advance of the axis of the turntable. This rigid frame forms an anchor to which the cables for swinging the boom are attached, and on account of the location of this anchor connection the leverage exerted thereon by the boom is not excessive.

As illustrated, A is the base or main frame of the mechanism upon which are mounted the boiler B, a series of winding drums C, and the derrick D.

E is the boom which is mounted upon a turntable F at the forward end of the frame, and has its outer end supported by a cable G extending to the top of the derrick.

H is the forwardly-projecting rigid frame, which is attached to the derrick sufficiently above the base to clear the swinging of the boom. This forwardly-projecting frame is braced to receive lateral stresses, and at its forward end is of a width preferably equal to or in excess of the width of the base frame.

J is a cross arm secured to the boom E at a point preferably slightly in advance of the outer end of the frame H.

K are sheaves at the opposite ends of the cross arm J, and L are sheaves on said arm in the central portion thereof.

M are cables which are anchored at one end to the frame H at opposite sides thereof and then extended to the sheaves K upon the opposite ends of the cross arm J and from these sheaves around the sheaves L, and thence along the boom to the winding drums. By this arrangement, the boom may be swung through an angle equal to the combined widths of the frame H and the cross arm J by drawing upon one or the other of the cables M. The arm J on the boom may be omitted in the apparatus when conditions do not require so large a radius of movement.

The winding drums for the cables M are preferably mounted upon the turntable, and are preferably driven by the same engine or motor to which they are alternately coupled. The same result, however, may be obtained by mounting the swinging boom upon a turntable independent of the swinging engine or motor, and anchoring the swinging ropes to each side of the boom, instead of to the overhanging frame.

As shown in Fig. 3, N and N' are the engine cylinders mounted on the turntable, which operate upon the crank O on the

crank shaft O'. P is a shaft parallel to the crank shaft O', and having mounted thereon the winding drums P' and P² upon opposite sides of the center, with an intermediate gear member P¹ intermeshing with a pinion O² on the crank shaft O'. Q is a third shaft parallel to the crank shaft O', having mounted thereon the winding drum Q' and Q² is a gear wheel on the shaft Q driven from the pinion O³ on the crank shaft. R and R' are clutch-operating mechanisms, not shown in detail, for respectively coupling the drums P' and P² to the gear member P¹, and S is a similar mechanism for coupling the winding drum Q' with the gear member Q². T is a controlling lever upon a rock shaft T', which is connected by a linkage T² and T³ with the clutch mechanisms R R', the arrangement being such that the rocking of the shaft T' in one direction will couple one of the drums P' P² to the gear member P¹, and the rocking in the opposite direction of the shaft will couple the other of said drums to said gear member, while at an intermediate point both drums are disconnected. Each of the drums P' P² is provided with a portion U for engaging a brake strap. These brake straps U' U² are connected by rock arms U³ U⁴ with parallel operating rods V and V'. The rods V and V' are connected by an equalizer V² with a single rod V³, which in turn is connected with a piston in a steam cylinder V⁴. W is a controlling valve for the steam cylinder V⁴, by which the steam may be alternatively admitted or exhausted from said cylinder, and this valve is operated by a rock arm W' connected by a link W² with the controlling lever T.

With the above described construction, the operation of the drums P' and P², and consequently the swinging of the boom, is controlled by the single lever T. This, when in neutral position, releases both the clutch mechanisms for actuating the drums P' and P² from the gear member P¹, and at the same time in this position of the lever the valve W is adjusted to admit steam to the cylinder V⁴, which moves the piston to draw upon the rod V³, and to thereby apply the brakes U' and U² to the drums P' and P². The result is that in this neutral position of the lever T, both drums are locked from movement, and through the medium of the cables M will hold the boom in fixed position. When, however, the lever T is adjusted to either side of its neutral position, one or the other of the drums will be coupled to the drive gear P¹, and at the same time the valve W will be adjusted to cut off steam from the cylinder V⁴, and after the exhaust, thereby releases both brakes. Thus, when the lever T is adjusted to one position, the boom will be swung in one direction, and the movement of the boom in the opposite direction is effected by an opposite move-

ment of the lever, while in the neutral position the boom is locked from movement. The winding drum Q' is coupled to the drive gear Q² by the operation of the mechanism S, and this is controlled by a second lever X adjacent the lever T. This enables the operator to control the movement of the boom by the one lever, and the operation of the hoisting by the other. There is also preferably provided a brake for the drum Q' operated by the rock shaft Y, and the lever Y', and an emergency brake Z is provided for each of the drums P' P² operated by the rock shaft Z' and the lever Z².

What I claim as my invention is:

1. The combination with a supporting base, of a boom pivotally mounted upon said base, a rigid member secured to said base and projecting forward beyond the axis of the pivot for said boom, and means for swinging said boom anchored to said rigid forwardly-projecting member.

2. The combination with a base, of a boom pivotally supported upon said base, a rigid member mounted on said base and projecting forward beyond the axis of the pivot of said boom and above the latter, and means for swinging said boom anchored to said rigid forwardly-projecting member.

3. The combination with a base, of a boom pivotally mounted thereon, a derrick rising from said base, a member rigidly secured to said derrick and projecting forwardly therefrom above said boom and beyond the axis of said pivot thereof, and means for swinging said boom anchored to said forwardly-projecting member.

4. The combination with a base, of a turntable mounted thereon, a boom mounted on said turntable, a derrick mounted on said base, a frame projecting forward from said derrick above said boom and beyond the axis of said turntable, a cable for swinging said boom anchored to said forwardly-projecting frame, and a winding drum on said turntable for operating said cable.

5. The combination with a base, of a turntable mounted thereon, a boom mounted on said turntable, a derrick rising from said base, a frame projecting forward from said derrick above said boom and beyond the axis of said turntable, cables anchored to said frame and engaging said boom to swing the latter in opposite directions, and winding drums for alternatively drawing upon said cables.

6. The combination with a base, of a boom pivotally mounted on said base and projecting beyond the same, a rigid frame projecting forward from said base above said boom, a pair of cables anchored to said frame and engaging said boom for swinging the same in opposite directions, winding drums for said cables, means for alternatively operating said winding drums to swing the boom,

and means for holding said drums from movement to lock the boom.

7. The combination with a base, of a boom pivotally supported on said base projecting beyond the same, a rigid frame secured to said base and projecting forward therefrom above said boom, cables anchored to said frame at opposite sides thereof, a cross arm on said boom, sheaves at opposite ends of said cross arm around which the cables are anchored on the opposite sides of said frame, and means for alternatively drawing upon said cables to swing the boom.

8. The combination with a base, of a boom pivotally mounted upon said base and projecting beyond the same, a frame rigidly attached to said base and projecting forward above said boom, a cross arm on said boom adjacent to the outer end of said frame, cables anchored to said frame on opposite sides thereof, each passing over a sheave on said cross arm at the end opposite that on which said cable is anchored to said frame, and winding drums for alternatively drawing upon said cables.

9. The combination with a base, of a turntable mounted thereon, a boom mounted on said turntable and projecting forward from said base, a derrick mounted on said base, a frame projecting forward from said derrick above said boom, cables anchored to opposite sides of said frame and engaging said boom, winding drums on said turntable for operating said cables, and brakes for said winding drums for locking the same and said boom stationary.

10. The combination with a base, of a swinging boom pivotally mounted thereon, a pair of cables for swinging said boom in opposite directions, winding drums for the respective cables, brakes for said drums, a drive mechanism, clutches for coupling said drive mechanism with the respective drums, and a control lever for said drums and brakes adapted in its neutral position to set the brakes and when positioned upon opposite sides of said neutral position to re-

lease the brakes and respectively operate said drums.

11. The combination with a base, of a boom pivotally mounted upon said base, cables for swinging said boom, drums for operating said cables, brakes for holding said drums, a fluid operated motor for said brakes, a clutch for driving said drums, and a lever for alternatively coupling said clutch and operating said fluid motor to set said brakes.

12. The combination with a base, of a boom pivotally mounted thereon, a pair of cables for swinging said boom in opposite directions, winding drums for said cables, brakes for said drums, a steam operated motor for simultaneously setting said brake clutch for alternatively operating said drums, and a controlling device for operating said fluid motor to set said brakes and alternatively to release said brakes and to clutch one or the other of said drums.

13. The combination with a base, of a turntable mounted thereon, a boom mounted upon and projecting forward from said turntable, a steam motor mounted on said turntable, a plurality of winding drums alternatively operated by said motor, cables operated by two of said drums for swinging said boom in opposite directions, steam actuated brakes for said drums, and a controlling lever for applying said brakes and alternatively coupling said drums to said steam-actuated motor.

14. The combination with a supporting base, of a boom pivotally mounted upon said base, a rigid member secured to said base and projecting forward beyond the axis of the pivot for said boom, and means reacting upon said member for moving said boom.

In testimony whereof I affix my signature in presence of two witnesses.

CLINTON W. RUSSELL.

Witnesses:

NELLIE KINSELLA,
JAMES P. BARRY.