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2,945,523

HOLD-DOWN APPARATUS

Filed Oct. 29, 1957

2 Sheets-Sheet 1

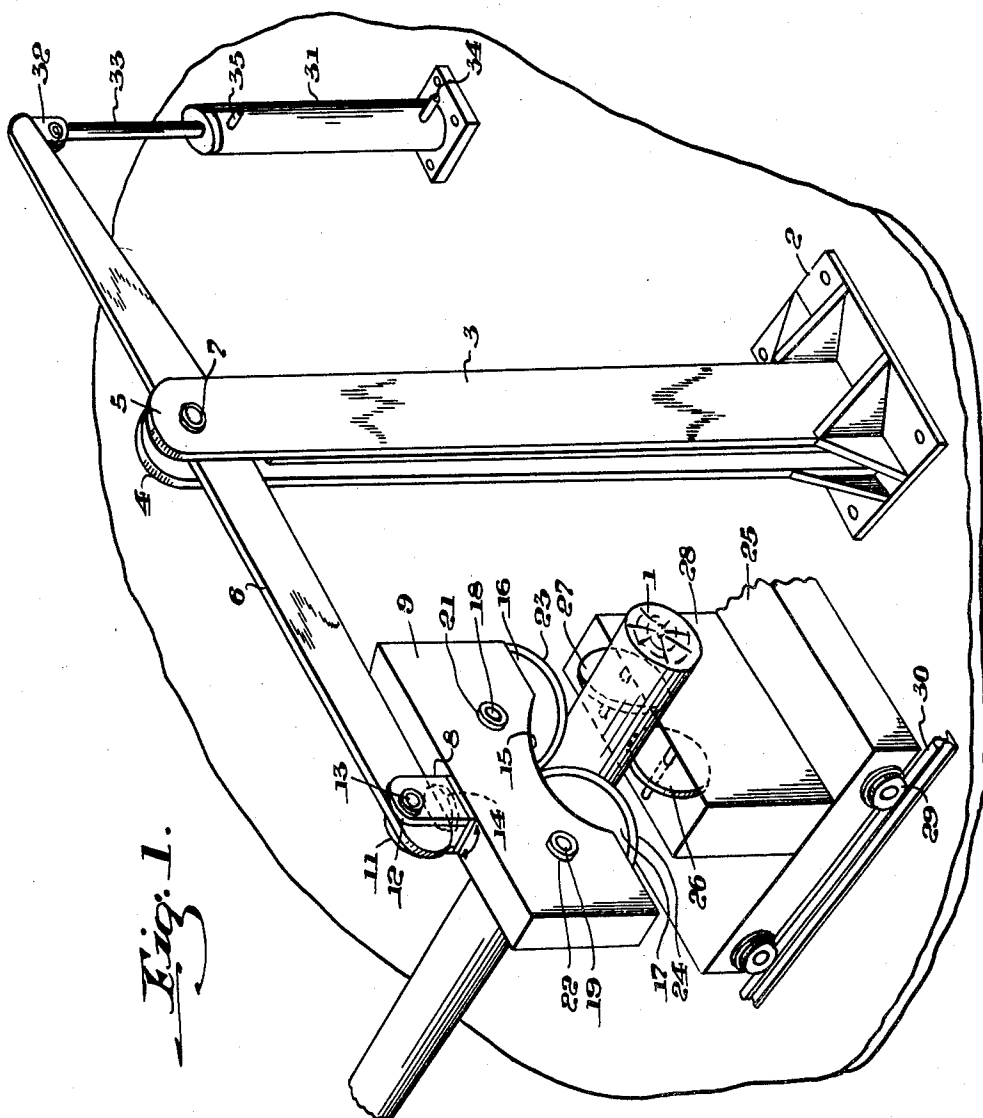


Fig. 1.

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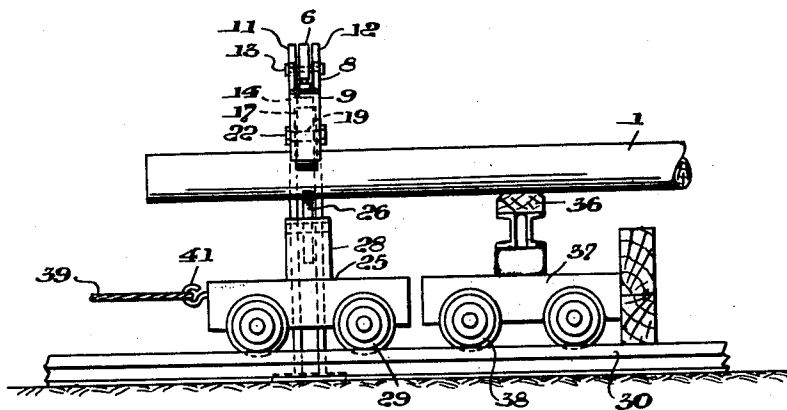


Fig. 2

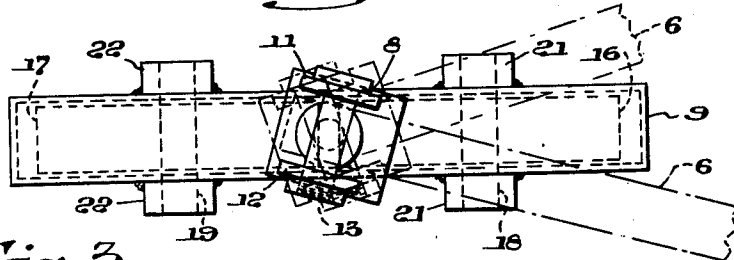


Fig. 3.

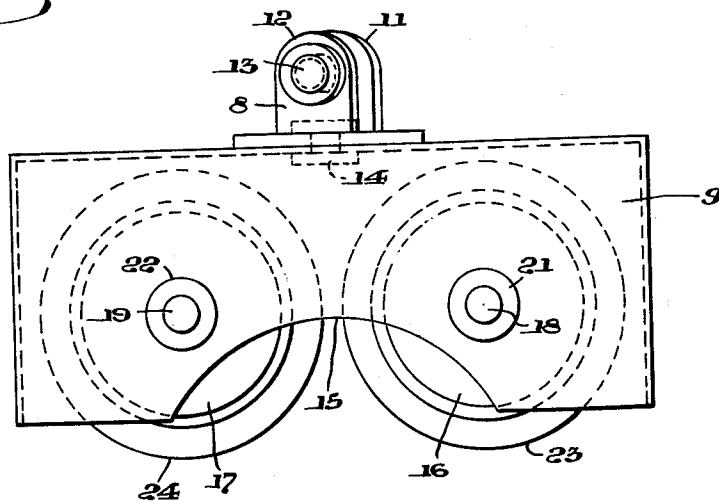


Fig. 4.

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HOLD-DOWN APPARATUS

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3 Claims. (Cl. 144—290)

This invention relates to a pole rossing machine and more particularly to a hold-down device for a pole as it is being rossed in such a rossing machine. This invention is used to prevent a pole from whipping out of control as it is being fed longitudinally through the rossing machine and is located on the out-feed side thereof. Such a rossing machine is disclosed by U.S. patent to Taylor et al. 2,330,336 dated February 4, 1941.

Heretofore, in rossing machines various means have been used to hold the pole and prevent it from whipping as the bark has been peeled therefrom, i.e. during rossing. The holding means have been either manual or mechanical. The manual means had disadvantages since they required brute strength and often caused injury to the operator. The mechanical means used have been complex with a rigidly mounted wheeled yoke to hold down the rotating pole following the rossing operation. While these prior mechanical hold-down devices have prevented the dangerous work of holding the pole manually, they have held the pole by the sheer weight of the yoke and this caused expensive installation and maintenance costs. Furthermore, since whipping could not be entirely eliminated and since these structures were constructed so that the holding yoke was limited to vertical movement only, the latter tended thereby to be damaged by the shock caused by the residual whipping of the rotating pole.

It is an object of the present invention to provide an improved hold-down device for a rossing machine which overcomes the difficulties heretofore encountered.

Another object is to provide a means for raising and lowering the yoke so that the yoke may selectively engage and disengage the pole.

A further object of this invention is to provide a hold-down mechanism which includes a means for cushioning the shock caused by the whipping movements of the rotating pole.

Still another object is to provide a simple light-weight hold-down device which is not subject to damage by shock from the whipping movements of the rotating pole.

Further objects and features of the invention will hereinafter appear and be understood more fully in the following specification taken from the accompanying drawings herein.

Briefly, the objects of the present invention are accomplished by providing a hold-down device with a pivotably mounted swivel link between a pole holding yoke and a leverage means attached thereto. This allows the yoke to follow the eccentric movements of the rotating pole as it emerges from the rossing machine but still allows the yoke to retain enough rigidity to constrain the pole from whipping too severely. Also the hold-down device is made of simple light-weight construction which helps the yoke to resist the rotating pole without being damaged by the residual whipping of the rotating pole. The yoke which is connected to the lever is loaded by means of an air cylinder connected to the lever. Thus, the loading of the holding means can be quickly varied

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to increase or decrease the restraining force on the pole and the holding means can be quickly disengaged from the pole after the pole is completely rossed.

Moreover, for the purpose of reducing shock, the holding yoke is provided with rubber tired wheels.

Fig. 1 is a perspective view of the hold-down device.

Fig. 2 is a front elevational view adjacent to the out-feed side of the rossing machine embodying the hold-down device of the present invention.

Fig. 3 is a top plan view of the hold-down yoke showing the lever pivotably attached thereto.

Fig. 4 is a side elevational view of the hold-down yoke shown in Figure 3.

Referring now to the drawings and in particular to Fig. 1, the invention is shown with that portion of the pole 1 being held in the hold-down device which has been rossed. Base 2 is fixedly secured from which there extends an up-right 3 carrying bosses 4 and 5. Lever arm 6 is pivotably supported on up-right 3 through bosses 4 and 5 by gudgeon 7. Lever arm 6 movably rotates around the fixed axis provided by gudgeon 7 and bosses 4 and 5 so as to form a basic first order lever. Connected to one end of lever arm 6 by a swivel link 8 there is mounted a yoke block 9. Swivel link 8 comprises two collars 11 and 12 through which extends a pin 13 positioned so that the yoke block 8 is rotatable about an axis centered at pin 13, parallel to lever arm 6, and perpendicular to the longitudinal axis of the pole 1. The two collars 11 and 12 are connected and they carry a swedged lug 14 shown in detail in Fig. 4, and yoke block 9 is attached to this swedged lug 14 so that it may rotate in a horizontal plane substantially parallel to the longitudinal axis of pole 1.

Lever arm 6, collars 11 and 12, and pin 13 are shown in two different positions in Fig. 3. These are provided to show the relative movement between the yoke block 9 and the lever arm 6 which is made possible by rotation of the yoke block 9 around swedged lug 14. The positions shown are not limiting but are shown as only two possible positions to accommodate the yoke to the eccentric movements of the pole as it is being rossed.

Yoke block 9 is in the form of a substantially rectangular housing having a substantially arcuate cut-out 15. Wheels 16 and 17 are carried in yoke block 9 on pins 18 and 19 which are freely rotatable in bearings 21 and 22 shown in Fig. 3. These wheels provide a V groove in which pole 1 is held as it is fed to the hold-down device from the rossing machine. Wheels 16 and 17 are provided with rubber tires 23 and 24 which help to cushion the shock caused by the rotation of the pole being rossed and also grip the pole on opposite sides substantially on the top.

Underneath pole 1 is supported by tram 25 which is provided with wheels 26 and 27 shown in outline in Fig. 1 which are mounted in a substantially rectangular housing 28. Tram 25 provides a means for supporting the rossed end portion of the pole emerging from the rossing machine so that it may be gripped on top by the wheels 16 and 17 of the yoke block 9 and underneath by the wheels 26 and 27 of the tram 25. Wheels 29 move on track 30 as that the tram 25 and the pole 1 supported thereon can be pulled away from the hold-down device from the rossing machine after the pole has been rossed. Air cylinder 31 is pivotably connected to lever arm 6 through link 32. Air cylinder 31 is fixedly mounted so that it may impart a raising and lowering force through piston arm 33 to that end of the lever arm 6 to which it is attached. As the cylinder is actuated it thus causes lever arm 6 to rotate around the axis of the flucrum provided on upright 3 by bosses 4 and 5 and gudgeon 7. Air cylinder 31 also cushions residual vibrations transmitted through lever arm 6 from the rotating pole which are not dampened by yoke block 9.

Piston arm 33 in air cylinder 31 is activated by forcing air through opening 34 in the lower portion of the cylinder. When a force is transmitted from lever arm 6 through swivel link 8 to yokeblock 9 by the actuating of cylinder 31 the rotating pole 1 is restrained from whipping by wheels 16 and 17 of yoke block 9 and wheels 26 and 27 of tram 25. As the pole rotates the wheels of the yoke 9 and tram 25 rotate and thus confine the pole to a rotation which is substantially longitudinal to the pole's axis, as it is fed from the rossing machine.

When piston arm 33 of air cylinder 31 is activated by forcing air through opening 35 in air cylinder 31, in the upper portion of the cylinder 31, a force is imparted to lever arm 6 whereupon yoke block 9 is lifted.

A typical sequence of operation starting with the yoke block 9 lifted to receive a pole emerging from the rossing machine is as follows:

The rossed end portion of a pole being rossed emerges from the rossing machine, and as the pole emerges, it is supported on the underneath side by tram 25. Tram is moved toward the raised yoke block 9 with pole 1 resting upon it until the rossed end portion of the pole is underneath and tangential to the yoke. Then air is forced in opening 34 in air cylinder 31 which raises piston arm 33 which causes yoke block 9 to be lowered. The force provided by the raising of piston arm 33 and the resultant lowering of yoke block 9 brings the wheels of yoke block 9 into contact with the top of pole 1 and causes the pole to be constrained from whipping between wheels 16 and 17 on yoke block 9, and wheels 26 and 27 of tram 25. After pole 1 is completely rossed, the last portion of the pole to be rossed falls on top piece 36 on another tram 37 with wheels 38 riding on track 30 shown in Fig. 2. Tram 25 is pulled by line 39 attached to hook 41 on tram 25 and pole 1 is thereby completely carried away from the hold-down device. Then the air cylinder 31 is activated by forcing air through opening 35 and releasing air out of the opening 34 by means of suitable valves. This causes the piston arm 33 to be lowered. The lowering of the piston arm 33 in turn raises the yoke block 9 for the receiving of the rossed end portion of the next pole emerging from the rossing machine and for the beginning of a new cycle as described above.

By providing a hold-down device as described the whipping movements of the rotating pole 1 do not damage the hold-down device. By the same token, the pole 1 is constrained to such an extent that the whipping is not allowed to become too severe.

I claim:

1. A hold-down device adapted to receive a rotating pole from a pole rossing machine which rotates and feeds a pole in an axial direction comprising an axially movable pole supporting tram having two tangentially opposed first rotatable wheels, yoking means having two tangentially opposed second rotatable wheels for cooperation with said first wheels for holding a rotating pole between said first and second wheels by contact of said first and second wheels on opposite sides of the rotating pole, a loading lever means for positively and yieldably holding said yoking means in contact with a rotating pole, and means pivotally and swivelly connecting said yoking means and said lever means for transmitting a load to said yoking means and providing for relative movement

between said yoking means and said lever means in horizontal and vertical planes whereby said yoking means is adapted to follow eccentric movements of a rotating pole held between said first and second wheels as it emerges from said rossing machines and to maintain sufficient rigidity to constrain a pole so held from whipping.

2. A hold-down device adapted to receive a rotating pole from a pole rossing machine which rotates and feeds a pole in an axial direction comprising a pole supporting tram having two tangentially opposed first rotatable wheels, yoking means having two tangentially opposed second rotatable wheels for cooperation with said first wheels for holding a pole between said first and second wheels by contact of said first and second wheels on opposite sides of the rotating pole, a loading lever means for positively and yieldably holding said yoking means in contact with a rotating pole, fluid pressure-actuating means for loading said lever to hold a pole between said first and second wheels, and means pivotally and swivelly connecting said yoking means and said lever means for transmitting a load to said yoking means and providing for relative movement between said yoking means and said lever in horizontal and vertical planes whereby said yoking means is adapted to follow eccentric movements of a rotating pole as it emerges from said rossing machine and still maintains sufficient rigidity to constrain the pole from whipping.

3. A hold-down device adapted to receive a rotating pole from a pole rossing machine which rotates and feeds a pole in an axial direction comprising a pole supporting tram having two tangentially opposed first rotatable wheels forming a substantially V shaped cradle equipped to support a rotating pole and move in an axial direction therewith, yoking means having two tangentially opposed second rotatable wheels forming a substantially V shaped cradle for cooperation with said first wheels for holding a rotating pole between said first and second wheels by contact of said first and second wheels on opposite sides of the rotating pole, a first class lever supported intermediate its ends on a fixedly mounted base for positively and yieldably holding said yoking means in contact with a rotating pole, force loading means connected to one end of said lever in which the force loading means is an air cylinder for raising and lowering said yoking means so as to load said yoking means, and means connecting said yoking means and said lever including a swivel link pivotally connected to the other end of said lever for transmitting a load to said yoking means and providing for simultaneous relative movement between said second wheels and said lever in horizontal and vertical planes whereby said second wheels are adapted to follow eccentric movements of a rotating pole held between said first and second wheels and still maintains sufficient rigidity to constrain the pole from whipping.

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