Nov. 17, 1931. H. J. BOE 1,832,446

APPARATUS FOR HANDLING REELS

Filed June 7, 1930

FIG. 1.

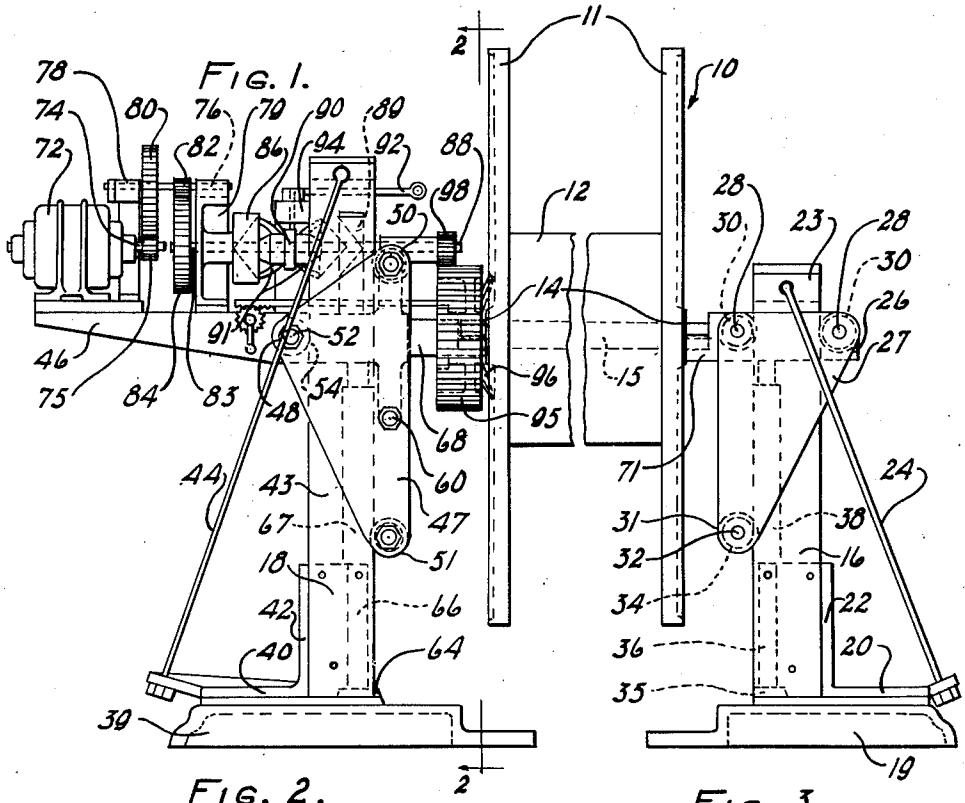


FIG. 2.

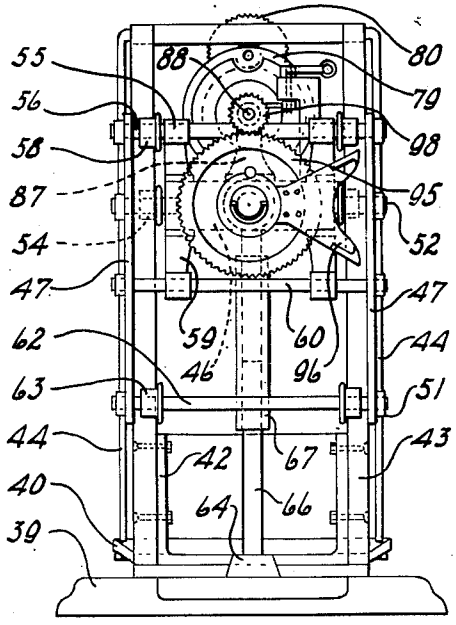
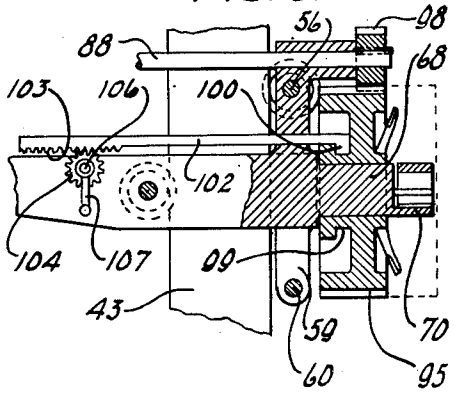


FIG. 3.



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APPARATUS FOR HANDLING REELS

Application filed June 7, 1930. Serial No. 459,651.

This invention relates to an apparatus for handling reels, and more particularly to an apparatus for handling cable reels of the sturdy and ponderous type.

An object of the invention is to provide an apparatus for handling reels which shall be convenient and efficient in operation and simple, rugged and durable in construction.

One embodiment of the invention contemplates the provision, in a reel support and winding apparatus, of a pair of spaced hydraulic jacks adapted to cooperate to lift a reel suspended upon a shaft resting at either end upon the jacks. Each jack comprises a pair of spaced upright posts embraced between interconnected triangular plates to which a bed plate is secured, the triangular plates having at each corner a roller which bears upon the adjacent edge of the upright members for distributing the strain imposed on the plates by the reel. One of the bed plates carries driving and clutch mechanisms for rotating the reel when the reel is suspended upon the jacks.

A better understanding of the invention is afforded by the following detailed description, considered in connection with the accompanying drawings, forming a part thereof, in which

Fig. 1 is a fragmentary side elevation of an apparatus comprising one embodiment of the invention;

Fig. 2 is a section taken on the line 2—2 of Fig. 1, and

Fig. 3 is a fragmentary enlarged detail showing with greater clarity the reel driving mechanism shown in Fig. 1.

Referring to the drawings, wherein similar parts are indicated by identical reference numerals, a reel 10 of the type used for storing and handling heavy cables is shown and comprises oppositely disposed heads 11—11 spaced by means of a cylindrical drum 12 which is suitably rigidly connected to the heads. The heads are provided externally with centered bossed apertures 14 in which is received a round shaft 15 for lifting and moving the reel. In the embodiment shown, the reel is lifted and supported between spaced supports 16 and 18. The right hand support 16 is secured upon a foundation or base 19 by means of an angle brace 20 having an upright portion 22. The support also includes a pair of oppositely disposed rectangular posts or supporting members 23—23 which are bolted or otherwise suitably secured to the angle brace 20 and are strengthened in an upright position by means of a pair of tie rods 24, one of which extends from the top of each post and is secured in the angle brace 20.

An auxiliary bed plate 26 is positioned between the rectangular posts 23—23 and is adapted to be carried along the posts by means of a pair of triangular plates 27—27. The triangular plates are provided at each upper corner with round bars or shafts 28—28, as shown in Fig. 1, extending through the auxiliary bed plate 26 and both of the triangular plates 27—27, and are provided adjacent each plate with a roller 30. It will be understood that a total of four rollers 30 are used between the triangular plates 27 and the centered auxiliary bed plate 26, the rollers bearing upon opposite edges of the upright posts 23—23 and securing traction thereon. The triangular plates are connected at their respective lower corners 31 by a shaft 32 which is suitably provided with a pair of rollers 34 which also engage the edge of the upright posts. The base 19 is apertured at a collar 35 to receive a stationary inlet pipe 36 which connects with a source of hydraulic or other suitable fluid pressure (not shown) which may be disposed in any suitable manner beneath the base. A cylinder sleeve 38 is secured to the underside of the auxiliary bed plate and being superposed upon the inlet pipe 36 travels therealong to raise or lower the auxiliary bed plate as the hydraulic pressure therein is varied.

The left hand support 18 is provided with a relatively heavy base 39 which is provided with an angle brace 40 secured thereto. The angle brace has an upright portion 42 to which is suitably rigidly secured a pair of spaced rectangular upright posts 43—43. Tie rods 44—44 extend from the top of the posts to the angle brace 40 for the purpose

of insuring that the rectangular posts will be held in proper position against any contemplated strain. A relatively large and heavy bed plate 46 is centered between the posts 43 by means of a pair of relatively heavy triangular plates 47—47 which are provided with upper corners 48 and 50 and a lower corner 51. The corners 48 of the plates are secured together by a shaft 52 which extends through the main portion of the bed plate 46 and is provided with a pair of spaced rollers 54—54 which ride on one edge of the posts. Extending upwardly from the bed plate are a pair of brackets 55—55 (Fig. 2), and a shaft 56 extends through the corners 50 of the plates and through the brackets 55 for carrying a pair of rollers 58—58 which ride on that edge of the posts opposite to that engaged by the rollers 54—54. The bed plate is also provided with downwardly extending brackets 59—59 in which is carried a tie bar 60 suitably rigidly secured to the triangular plates approximately midway of the corners 50 and 51. In order to provide a third point of support for the bed plate upon the uprights 43, a shaft 62 connecting the lower corners 51—51 of the plates is provided with a pair of rollers 63—63 which ride upon the edge of the posts below the rollers 63. The base 39 is apertured at a collar 64 to receive a stationary inlet pipe 66 which connects with any suitable source of hydraulic or any suitable fluid pressure disposed below the base 39, and a cylinder sleeve 67 secured to the under-surface of the bed plate 46 is superposed upon the inlet pipe and adapted to be slidable thereon to permit the raising and lowering of the bed plate 46 as the pressure in the cylinder may be varied.

Upon that end nearest the reel 10 the bed plate 46 is formed into a cylindrical extension 68 (Fig. 3) from which projects a concave ledge or cup 70 for receiving the shaft 15. A similar concave ledge or cup is formed on the left hand end of the auxiliary bed plate 26 (Fig. 1) for receiving the opposite end of the shaft 15. This latter ledge is designated as 71.

Since the bed plate 46 is designed to carry a reel driving mechanism to be hereinafter described, the cross sectional areas of the inlet pipe 66 and of the cylinder 67 are made proportionally greater than the areas of the corresponding elements in the support 16. By connecting both inlets 36 and 66 to the same source of hydraulic pressure, it is therefor made possible to raise both bed plates the same distance from the bases, and thus maintain the shaft 15 in a horizontal position when the cylinders 38 and 67 are raised.

In operation, the reel to be lifted is rolled between the supports 16 and 18 and the bed plates lowered until the cups 70 and 71 thereof are lower than the shaft 15. The reel is then moved so as to position the shaft over the cups and pressure is applied to the cylinders to raise the bed plates to any desired height. It will be apparent that as soon as the reel is lifted from the ground its entire weight falls upon the concave ledges 70 and 71 tending to rotate them downwardly. This tendency, however, is effectually resisted by the provision of the rollers in the lower corners of the triangular plates and the rollers 30 and 54 on the opposite edges of the posts, and these rollers are maintained in contact with the edges of the posts by the remaining rollers 30 and 58 on the inner edges of the posts. It will thus be apparent that despite the great weight resting upon the concave ledges and the resulting force with which the respective rollers bear upon the surfaces of the posts, the strain on the plates is evenly distributed to permit relatively easy movement of the bed plates on the jacks.

In order to permit inspection, repair or removal of the cable from the reel, it is frequently desirable to rotate it when hoisted upon the jacks. Apparatus for accomplishing this purpose is maintained upon the bed plate 46 and includes a motor 72 having a driving shaft 74, upon the end of which is keyed a gear 75. Mounted upon a shaft 76, suitably journalled in bearing housings 78 and 79, is a larger gear 80 which meshes with the drive gear 75 and rotates a smaller gear 82 keyed to the shaft 76. A shaft 83 is also journalled in the bearing housing 79 and is provided with a relatively large gear 84 which meshes with the gear 82. A drum 86 having a conical recess is keyed to the shaft 83 so as to be rotatable therewith. Journalled in a bracket 87 (Fig. 2) extending upwardly from the bed plate 46 is a shaft 88 which extends through and is suitably journalled in a stationary brake drum 89 also having a conical recess. Upon that end nearest to the drum 86 the shaft 88 has slidably keyed thereon a collar 90, having at each end cone-shaped portions 91—91, adapted to engage the cone-shaped recesses in the rotating drum 86 and stationary drum 89. A lever 92 for shifting the collar 90 from engagement with either the rotating drum 86 or the stationary brake drum 89 is journalled in a bearing 94. A relatively large and heavy gear 95 (Fig. 3) for driving the reel is slidably mounted upon the cylindrical extension 68 of the bed plate and is provided with a pair of projecting ears 96—96. A gear 98 keyed to the end of the shaft 88 meshes with the large gear 95 and is adapted to rotate it when the collar is in operative engagement with the rotating clutch drum 86. The gear 95 is movable into and out of engagement with the reel 10, as desired, and for that purpose is provided interiorly thereof with a cir-

cular groove 99 which is engaged by a projection 100 on the end of a rack 102. It will be understood that the rack 102 is readily slidable in ways (not shown) on the bed plate and is operative to shift the gear 95 along the cylindrical extension to engage and disengage with the reel. The rack is provided upon its lower surface with a rack portion 103 which is engaged by a toothed wheel 104 keyed to a shaft 106 suitably journalled in the side of the bed plate. The shaft is provided with a handle 107 by rotation of which the rack may be moved. It will be noted that the gear 95 is continually in engagement with the gear 98 hence, in order to rotate the reel 11, it is merely necessary to turn the handle 107 to thrust the gear 95 to the right as shown in Fig. 1, bringing the ears 96, 96 thereof into engagement with the reel heads.

From the foregoing it will be observed that it is not necessary to stop the motor 72 when it is desired to stop the reel from rotating. The gear 95 may be rotated by placing the lever 92 in the position shown in Fig. 1, the drive being then secured from the drive gear 75 to the gear 80, shaft 76, gear 82, gear 84, shaft 83, clutch 88, collar 90, shaft 88 and gear 98. When it is desired to stop the gear 95 the lever is turned, thrusting the collar out of engagement with the rotating clutch and into engagement with the stationary brake drum 89 which, since the collar is keyed to shaft 88, stops it and the gear 98 from rotating.

The apparatus may be conveniently employed to hold a reel operating as a take-up reel for an adjacent reel (not shown) from which cable is being removed, in order that defective areas in the cable may be noted while the cable is suspended between the reels. When such an area is located, it is necessary to stop the driven take-up reel abruptly in order to prevent the defective area from being taken thereon. This may be accomplished by quickly moving the lever 92 from the position shown in Fig. 1 into engagement with the brake drum 89, thus disconnecting the collar 90 from the rotating clutch cone 86 and promptly stopping the rotation of the gear 95. When the apparatus is used for the support of a loaded reel from which the cable is being drawn, or when for any other reason, it is desired that the reel rotate idly without being driven, the gear 95 and ears 96 may be easily withdrawn from contact with the reel by retracting the rack. This effect may be secured without stopping the rotation of the driving means since the reel 95 is continually engaged with the gear 98 and its teeth are adapted to slide between the teeth of the gear 98 when it is drawn along the cylindrical projection 68 irrespective of whether the gears 95 and 98 are rotating.

While the invention has been disclosed and described as applied to a specific form of reel winding jack, it will be understood that the invention is capable of application to other types thereof, and should therefore be only limited by the scope of the appended claims.

What is claimed is:

1. In an apparatus for handling a reel having an axle, a pair of jacks each provided with a bed plate adapted to engage an end of the axle to lift the reel, and self contained motor means mounted on one of the bed plates to engage with the reel for rotating the same.

2. In an apparatus for handling a reel having an axle, a pair of jacks each provided with a bed plate adapted to engage an end of the axle to lift the reel, a gear mounted on one of the bed plates and slidable into and out of engagement with the reel, and a motor mounted on the same bed plate to drive the gear.

3. In an apparatus for handling a reel having an axle, a pair of jacks each provided with a bed plate adapted to engage an end of the axle to lift the reel, a gear mounted slidably on one of the bed plates and provided with a reel engaging member which in one position of the gear couples the reel thereto for rotation therewith and in another position of the gear is disengaged from the reel, and a motor mounted on the same bed plate to drive the gear.

4. In an apparatus for handling a reel having an axle, a pair of jacks each provided with a bed plate adapted to engage an end of the axle to lift the reel, a gear mounted slidably on one of the bed plates and provided with a reel engaging member which in one position of the gear couples the reel thereto for rotation therewith and in another position of the gear is disengaged from the reel, and combined motor and brake means mounted on the same bed plate and connected to the gear.

5. In an apparatus for handling a reel having an axle, an upright, a supporting member slidably mounted on the upright and guided thereon by two rollers engaging one side of the upright and one roller engaging the opposite side thereof, means carried by the supporting member to engage an axle of a reel, and means to raise and lower the supporting member on the upright.

In witness whereof, I hereunto subscribe my name this 29th day of May A. D., 1930.

HELMER J. BOE.