

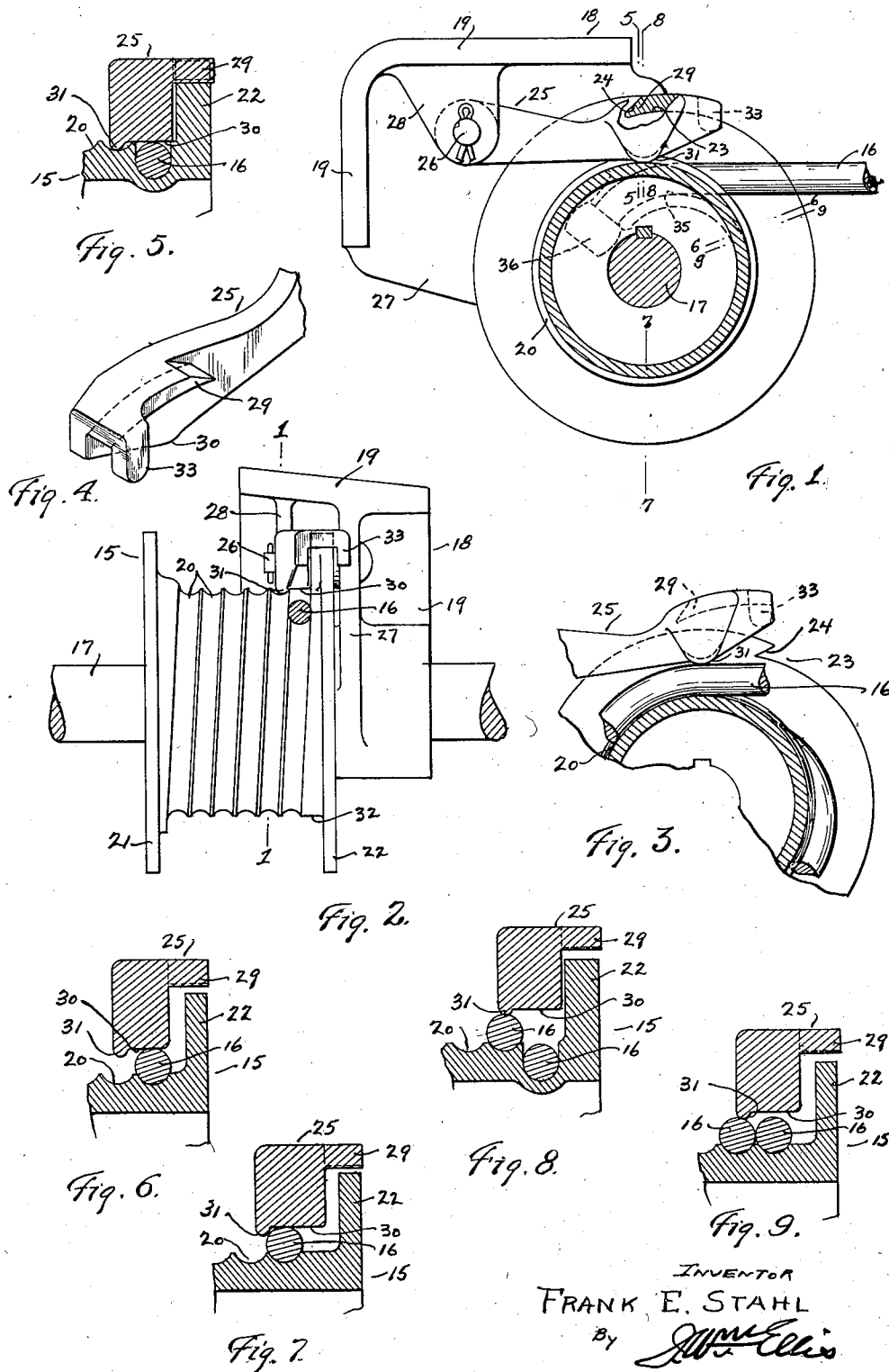
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MEANS FOR PREVENTING REVERSE WINDING OF A CABLE ON A DRUM

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ING OF A CABLE ON A DRUMFrank E. Stahl, Tonawanda, N. Y., assignor to
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My invention relates in general to hoisting devices and particularly to means for stopping the rotation of the drum when the cable has become substantially unwound therefrom.

It is well known to those skilled in the art that when operating a wire rope drum hoist, there is a tendency for the operator to keep revolving the drum after all the cable has been unwound therefrom, thereby causing the cable to start winding upon the drum in the opposite direction. This is not only liable to cause serious damage to the hoist or the load being handled, but makes the cable unfit for further use, since when a hoisting cable is wound in the wrong direction upon a drum it is kinked in such a manner that the kink can not be removed.

The principal object of my invention has been to provide means for positively stopping and locking the drum when the cable has been substantially unwound therefrom so as to make it impossible to revolve the drum any further in a lowering or unwinding direction.

Moreover, my invention does not in anywise affect the normal operation of the hoist and it is automatic in its locking and unlocking action.

Furthermore, my invention may be applied to any hoisting apparatus having a drum, and is so inexpensive that it does not add materially to the cost of such equipment.

The above objects and advantages have been accomplished by the device shown in the accompanying drawing, of which

Fig. 1 shows a side, sectional elevation of one form of my invention, and is taken on line 1-1 of Fig. 2.

Fig. 2 is a front elevation thereof.

Fig. 3 is a fragmentary, sectional view of the drum in another position.

Fig. 4 is a perspective view of a portion of the latch lever.

Figs. 5-9, inclusive, are enlarged, fragmentary, sectional views, showing various positions of the parts, and are taken, respectively, on lines 5-5, 6-6, 7-7, 8-8, and 9-9 of Fig. 1.

Referring now to the drawing, 15 represents a hoist drum on which a cable 16 is to be wound. The drum is suitably mounted upon a shaft 17 which is designed for actuation by any standard type of hand hoist which does not form a part of my invention and, therefore, is not shown. The shaft is mounted in suitable bearing brackets, one of which is shown at 18. Each bracket is provided with suitable flanges 19 for securing the bracket in place.

The drum shown is one having the conven-

tional type of helically grooved guide 20, but, obviously, my invention is applicable also to drums having unbroken cylindrical peripheries. The drum is provided with an end flange 21 and an end flange 22. The end flange 22 which is located adjacent the bracket 18 is provided with a suitable notch 23 in its periphery which has its abutting surface 24 so arranged that it will be brought into engagement when the drum is rotated in a direction to unwind the cable, or, as shown in Figs. 1 and 3, in a clockwise direction.

A latch lever 25 is provided. This lever is pivotally mounted at its rear end and is carried by means of a pin 26 passed through the web 27 of the bracket and a lug 28 secured thereto. The forward end of the lever is provided with a latch dog 29 which is so shaped and positioned as to engage the notch 23 and its abutment 24 when it is permitted to move to its normal locking position. The underside of the lever is provided with a land stop 30 and a groove stop 31. The land stop is designed to engage the concentric flat surface or land 32 of the drum, and the groove stop 31 is designed to drop into and engage the second convolution of the helically grooved guide 20. The latch dog 29 is, of course, disposed substantially over the flange 22 of the drum and depending from the forward end thereof is an arm 33 which hangs over and beyond the outside surface of the flange 22 of the drum and acts as a stop against lateral movement of the lever. The lever is somewhat loosely mounted upon the pin 26 and, the space between the inner surface of the land stop 30 and the depending arm 33 being slightly greater than the maximum thickness of the flange 22, there is some limited lateral movement of the latch lever which aids somewhat in the contacting engagement of the latch lever with the cable.

The cable 16 may be attached to the drum in any desired manner, but I prefer to have the inner end extend inwardly through the wall of the drum in a smooth curved surface 35 (shown in dotted lines in Fig. 1) and to have the inner end extend into the interior of the drum where it is held by means of the conventional enlarged head 36. When the cable has been substantially unwound from the drum, or as shown in Figs. 1 and 5, the stops 30 and 31 will engage with their respective surfaces and permit the locking engagement of the latch dog 29 with the notch 23 on the periphery of the drum flange. When, however, the drum is rotated in a counter-clockwise direction, the cable

will start to wind upon the drum in the helically grooved guide 20. As the drum is rotated, the outer periphery of the cable increases in diameter from the center of the drum until the cable reaches its maximum diameter when lying in the grooved guide. When in this position, as clearly shown in Fig. 7, the outer surface of the cable will bear against the land stop 30 and will thereby raise the latch lever to a point where the latch dog is elevated above the periphery of the drum flange. As the drum is continued to rotate and the single coil of rope reaches one complete turn, the cable is moved over to the position shown in Fig. 8. During this movement, the cable has been moved over until it occupies a position under the groove stop 31, as clearly shown in Fig. 8. During the continued winding of the cable, the latched lever is kept elevated by engagement of either stop with the cable. When, however, the cable is being unwound, engagement of the stops with the cable will keep the latch lever elevated until the position shown in Fig. 1 is reached. It is necessary to have the groove stop 31 for engagement with the cable just before the completion of the first coil, for the reason that there is a low spot on the drum just preceding the place where the cable enters the drum (see Fig. 8) into which the land stop 31 would drop and thus lock the drum with slightly less than one complete turn of cable upon it. However, because of the provision of the groove stop 31 which engages the end of the first coil of cable, the latch lever is kept elevated over this low spot, after which the land stop will engage the first coil of cable until it has been unwound (see Figs. 8 and 6) and reaches the position substantially that of Figs. 1 and 5, whereupon it will be allowed to drop and engage the notch of the wheel flange. When so engaged, it is obvious that the drum will be stopped and will be prevented from further turning, thus obviating any possibility of reverse winding of the cable upon the drum.

Obviously, some modifications of the details herein shown and described may be made without departing from the spirit of my invention or the scope of the appended claims, and I do not, therefore, wish to be limited to the exact embodiment of the invention as shown by the drawing.

I claim:

1. The combination with a drum and a cable

therefor of means for preventing reverse winding of the cable, comprising a bearing bracket for the drum, the drum being formed with a detent, a gravity actuated latch lever pivotally carried by the bearing bracket, a latch dog carried at the outer end of the latch lever and engageable with a detent formed on the drum, and means co-operating with the cable to prevent the latch from engaging the notch until the cable is substantially unwound.

2. The combination with a drum and a cable therefor of means for preventing reverse winding of the cable, comprising a bearing bracket for the drum, a gravity actuated latch lever pivotally carried by the bearing bracket, the drum being formed with a detent, a latch dog carried at the outer end of the latch lever and engageable with the detent formed on the drum, the latch lever being formed with means for engaging the cable for at least one complete coil thereof so as to prevent locking action until the cable is substantially unwound.

3. The combination with a drum and a cable therefor of means for preventing reverse winding of the cable, comprising a bearing bracket for the drum, the drum being formed with a notch, a gravity actuated latch lever pivotally carried by the bearing bracket, a latch dog carried at the outer end of the latch lever and engageable with the notch formed on the drum, a land stop and a groove stop carried by the latch lever and engageable respectively with a concentric land on the drum and the first convolution of the helical groove thereof when the cable is substantially unwound to cause engagement of the latch dog with the notch of the drum to lock the drum against further unwinding movement.

4. The combination with a drum and a cable therefor of means for preventing reverse winding of the cable, comprising a bearing bracket for the drum, the drum being formed with a notch, a gravity actuated latch lever pivotally carried by the bearing bracket, a latch dog carried at the outer end of the latch lever and engageable with the notch formed on the drum, means co-operating with the cable to prevent the latch from engaging the notch until the cable is substantially unwound, and means carried by the outer end of the latch lever for engaging the flange of the drum to keep the lever in alignment.

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