

Aug. 20, 1935.

E. C. S. CLARK

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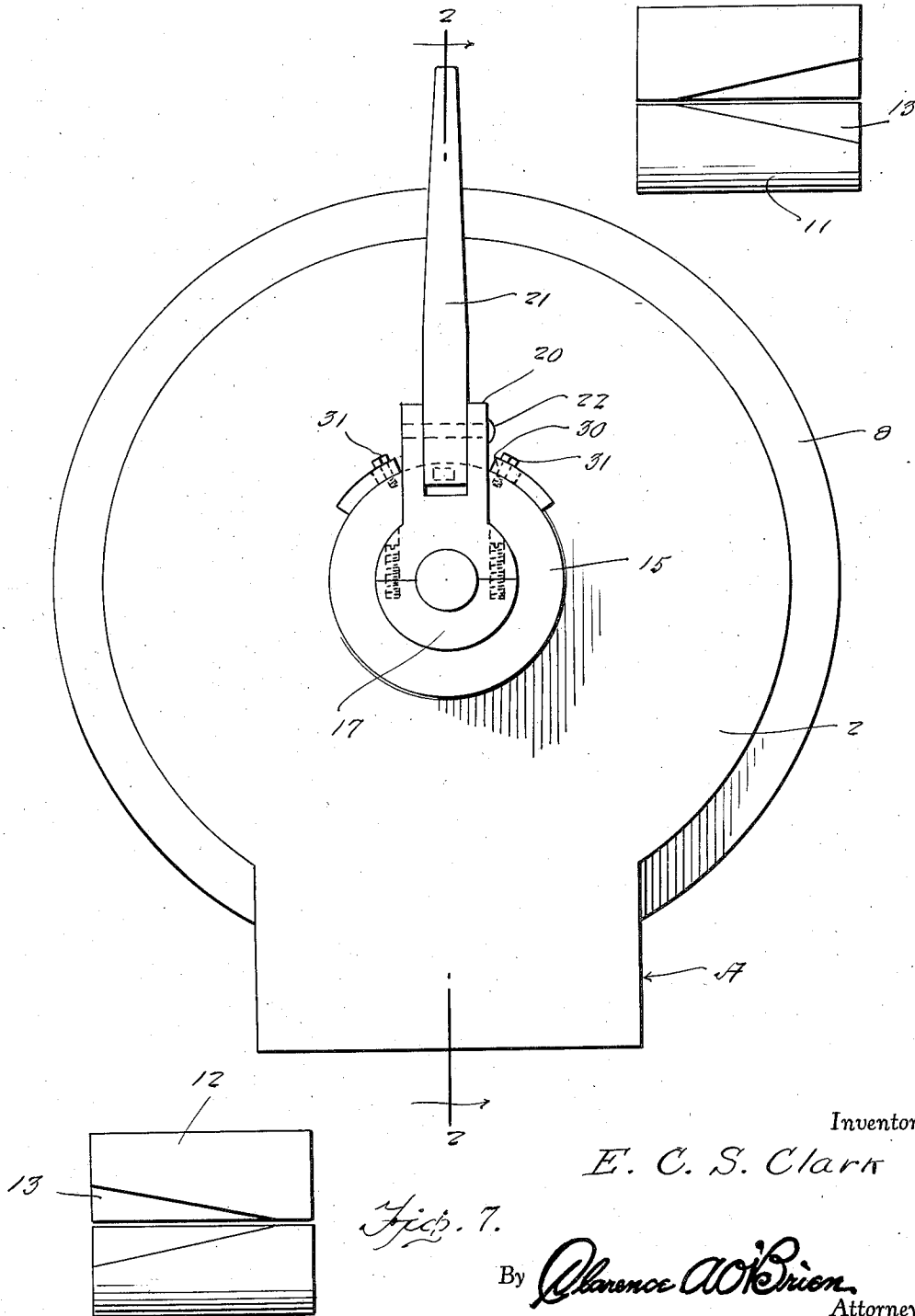
WINCH

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4 Sheets-Sheet 1

*Fig. 1.*

*Fig. 8.*



Inventor

*E. C. S. Clark*

*Fig. 7.*

By

*Clarence A. O'Brien*

Attorney

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E. C. S. CLARK

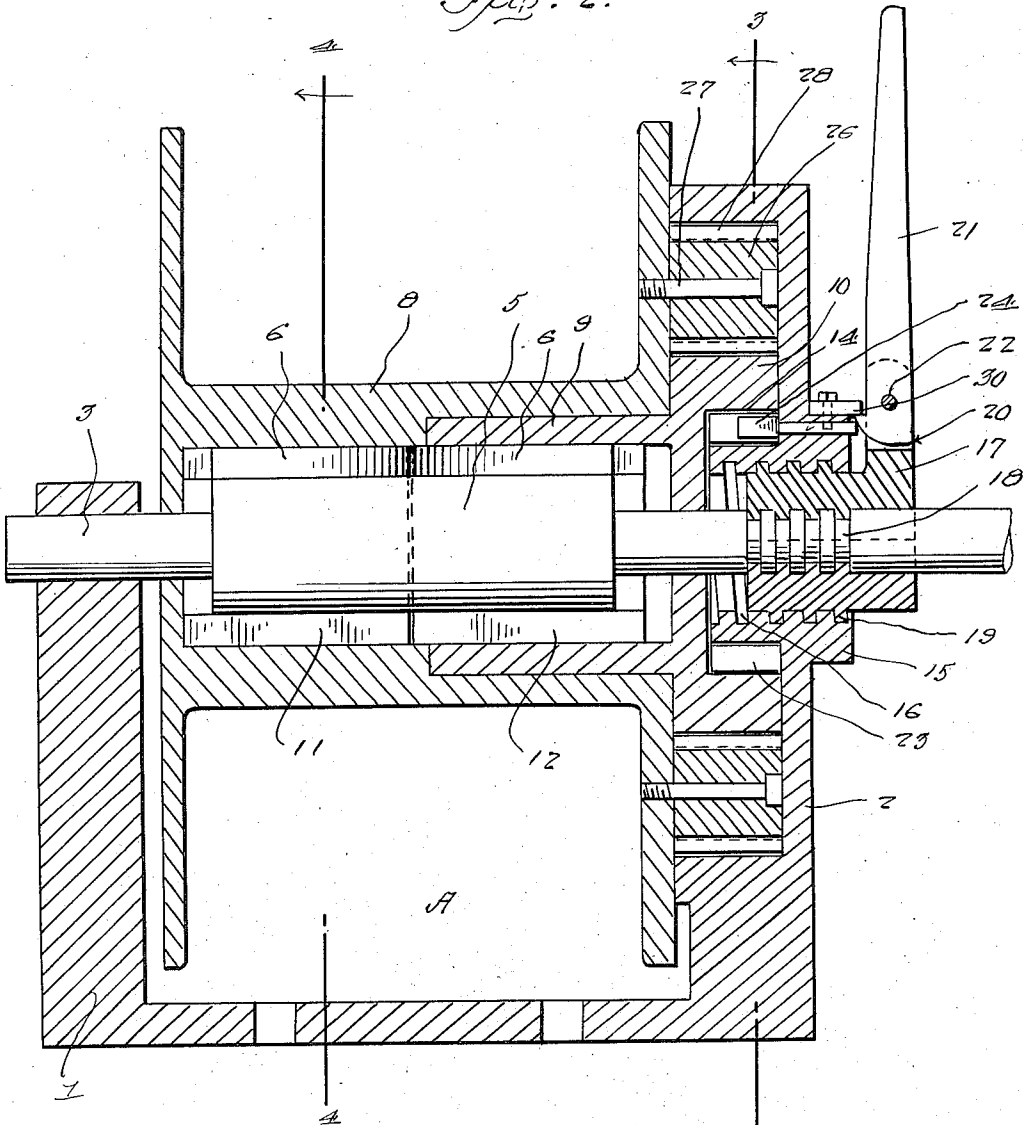
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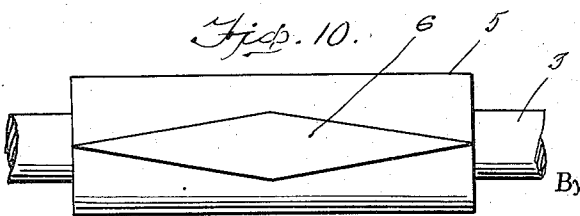
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*Fig. 2.*



*Fig. 10.*



Inventor

*E. C. S. Clark*

By

*Clarence A. O'Brien*

Attorney

Aug. 20, 1935.

E. C. S. CLARK

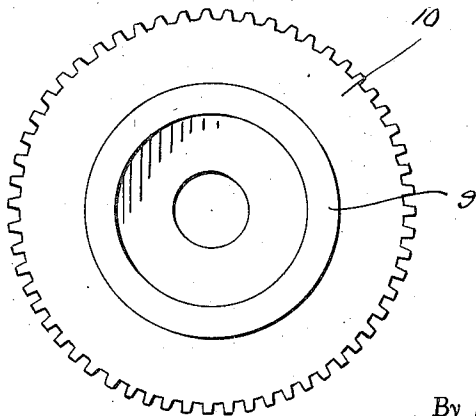
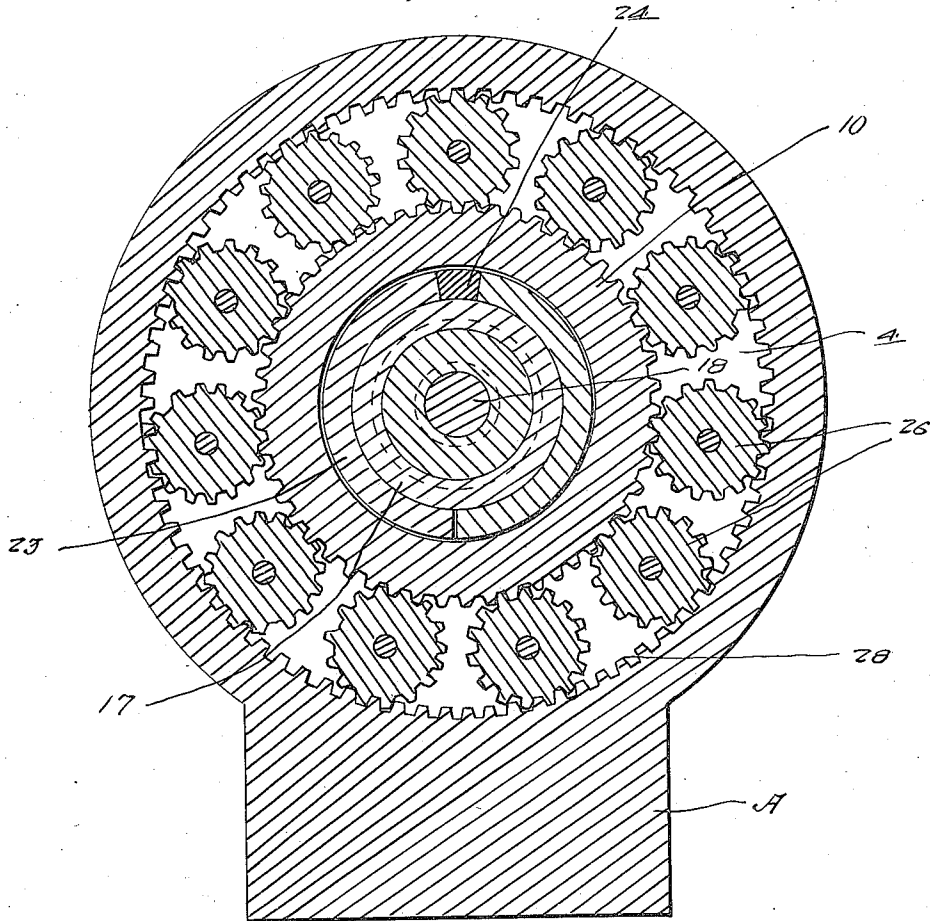
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*Fig. 3*



*Fig. 5.*

Inventor

*E. C. S. Clark*

By *Clarence A. O'Brien*  
Attorney

Aug. 20, 1935.

E. C. S. CLARK

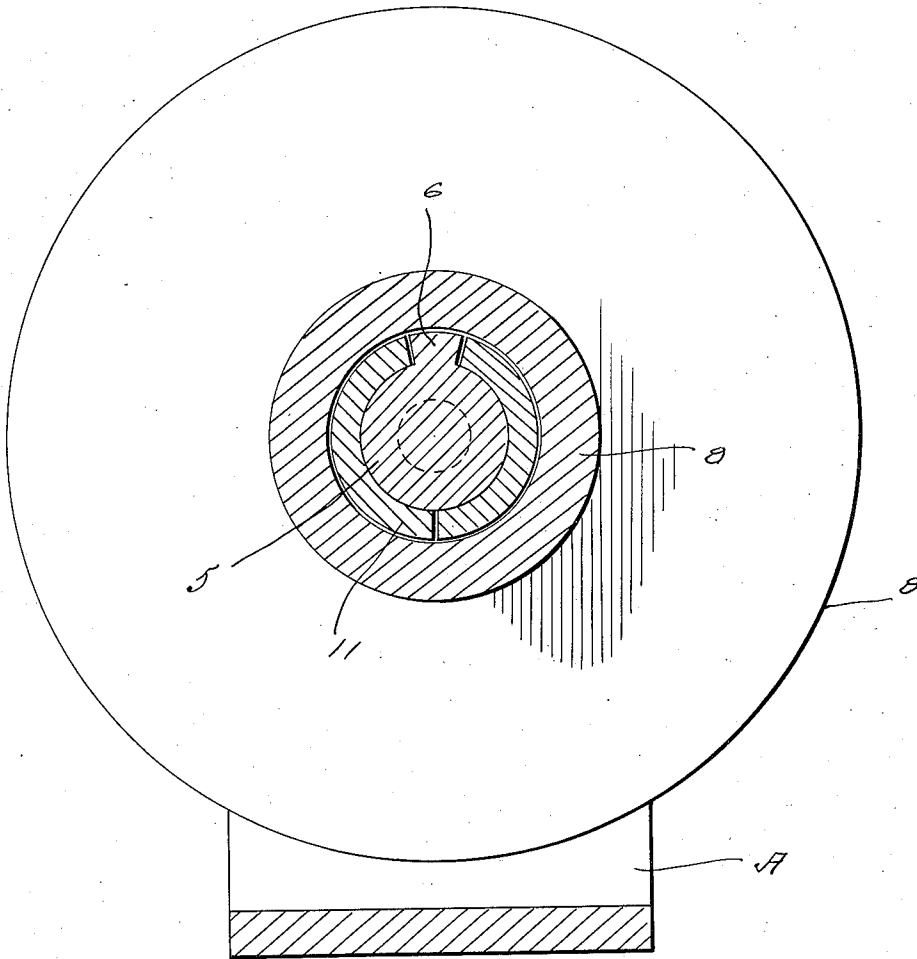
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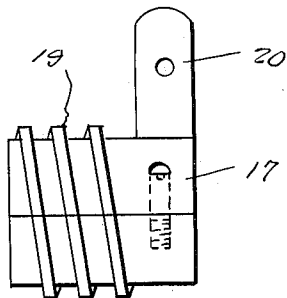
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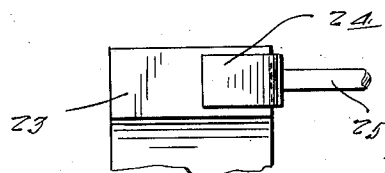
*Fig. 4.*



*Fig. 6.*



*Fig. 9.*



Inventor

E. C. S. Clark

By *Chas. A. O'Brien*  
Attorney

## UNITED STATES PATENT OFFICE

2,011,998

WINCH

Ephraim C. S. Clark, Gloucester, Mass.

Application April 30, 1935, Serial No. 19,102

4 Claims. (Cl. 254—187)

This invention relates to a winch, the general object of the invention being to provide means whereby the reel of the winch can be driven at two speeds as desired, with means for applying a brake to the reel after it has been turned to the desired extent.

This invention also consists in certain other features of construction and in the combination and arrangement of several parts, to be hereinafter fully described, illustrated in the accompanying drawings and specifically pointed out in the appended claims.

In describing the invention in detail, reference will be had to the accompanying drawings wherein like characters denote like or corresponding parts throughout the several views, and in which:

Fig. 1 is a view looking toward the front end of the device.

Fig. 2 is a section on line 2—2 of Fig. 1.

Fig. 3 is a section on line 3—3 of Fig. 2.

Fig. 4 is a section on line 4—4 of Fig. 2.

Fig. 5 is a view looking towards the inner end of the gear.

Fig. 6 is a side view of the worm member to which the handle is attached.

Fig. 7 is a view of one of the split sleeves or bushings.

Fig. 8 is a view of the other sleeve or bushing.

Fig. 9 is a view of the brake wedge and a part of the split sleeve engaged by the wedge.

Fig. 10 is a view of the wedge carrying roll of the shaft.

In these drawings, the letter A indicates the frame of the device which includes the uprights 1 and 2, the upright 1 having a bearing opening therein for the rear end of the shaft 3. The upright 2 has an annular chamber 4 therein, through the center of which the shaft 3 passes and said shaft has attached thereto a roll 5 which carries a double wedge 6 on a part of its circumference, the wedge extending longitudinally with its points terminating at the ends of the roll. The reel is shown at 8 and at one end has a bearing opening therein through which the rear part of the shaft 3 passes, the rest of the hub of this reel having an enlarged bore which is of two diameters with the large part of the bore receiving a sleeve 9 extending inwardly from a gear 10 which is located in the chamber 4. A pair of sectional bushings or sleeves 11 and 12 are located in the bore, one being located in the sleeve 9 and both bushings 11 and 12 surround the roll 5 and each bushing has a wedge-shaped recess 13 for receiving portions of the wedge 6.

A socket 14 is formed in the outer face of the gear 10 and the shaft passes therethrough and the inner part of the gear has a bearing opening therein for a portion of the shaft.

The central portion of the upright 2 is formed with a horizontally arranged boss 15 which has a portion projecting outwardly from the outer face of the part 2 and another portion extending into the socket 14 and the internal wall of this boss is spirally grooved as shown at 16. A two-part hub 17 surrounds the outer part of the shaft and is held thereto by annular internal ribs thereon engaging annular grooves 18 in said part of the shaft. The member 17 is also provided with a spiral rib 19 on its exterior circumference for engaging the grooves 16.

A lateral projection 20 is formed on the outer end of the member 17 and a lever 21 is pivoted thereto, the pivot 22 being spaced from the lower end of the lever which is slightly rounded and of cam shape as shown.

A sectional sleeve 23 is located in the socket 14 of the gear 10 and surrounds the inner end of the boss 15 and a wedge 24 has its shank 25 passing through an opening in the boss with its outer end so located that when the lever 21 is swung outwardly the cam end of the lever will engage the outer end of the shank and thus move the wedge 24 inwardly to cause expansion of the sectional sleeve 23 which will lock the gear 10 to the boss 15 so that these parts act as a brake for the reel.

The reel has a plurality of pinions 26 fastened thereto by the bolts 27, the pinions being arranged in an annular row and engage the gear 10 and they also engage an internal ring gear 28 on the inner circumference of the chamber 4 as more clearly shown in Fig. 3.

A guide 30 formed of two parts is adjustably held on the upper outer portion of the boss 15 by the bolts 31 passing through slots in the section of the guide and this permits the lever 21 to be adjusted to compensate for wear in wedge 6, so that the brake can be applied over a larger arc of movement of lever 21 minimizing slippage between clutch and brake applications.

For instance, if the parts are unworn the guide sections 30 may be adjusted so that they will prevent engagement of the cam end of the lever with the wedge unless the lever 21 is in a vertical position. When the bushings 11 and 12 or the wedge 6 become worn, in order to cause the wedge 6 to properly engage either bushing the lever 21 would have to be swung to the left in Figure 1 and thus the guide sections would have

to be spaced farther apart so as to permit the cam end of the lever to apply the brake or otherwise there would be too much lost motion between the engagement of the clutch and brake so that the drum would slip back. By providing the adjustable guide the brake can be applied at the exact position where the clutch disengages and at the same time not allow the clutch and brake to be applied at the same time. After the cam end of the lever comes opposite a guide section the guide will prevent the lever from engaging the brake wedge.

It will be seen that by turning the member 17 in one direction by the handle 21, with the handle in the position shown in Fig. 2, the movement of the member 17 due to engagement of its spiral rib in the spiral groove 16 of the boss 15 will cause longitudinal movement of the member 17 and therefore of the shaft 3 in one direction and this movement will cause a part of the wedge 6 on roll 5 to engage in the recess 13 of the split bushing 11 so that this bushing will be expanded into firm engagement with the hub of the reel and thus the reel will be locked to the shaft and the reel will rotate at the same speed as the shaft. By turning the member 17 in an opposite direction, the shaft 3 will be moved longitudinally in an opposite direction so that another part of the wedge 6 will engage the recess 13 in the bushing 12 so that the bushing will be expanded against the sleeve 9 of the gear 10 and thus the gear will be locked to the shaft and the rotary movement of the shaft and the gear will be communicated to the reel by pinions 26 and thus the reel will be rotated at less speed than that of the shaft. By swinging the lever 21 downwardly, its lower end will engage the brake wedge and move said wedge to a position where the bushing 23 will be expanded to hold the gear against rotary movement and through the pinions 26 this will act as a brake to the reel or drum 8. As will be seen the brake cannot be applied until the cam end of lever 21 is in a position where it can pass between the guide sections so that there is no danger of applying the brake when the parts are to be rotated which would cause wear of the parts.

It is thought from the foregoing description that the advantages and novel features of the invention will be readily apparent.

It is to be understood that changes may be made in the construction and in the combination and arrangement of the several parts, provided that such changes fall within the scope of the appended claims.

I claim:

1. A winch of the class described comprising a supporting frame, a shaft, a drum rotatably arranged on the shaft, a gear rotatably arranged on the shaft, pinions carried by the drum and meshing with the gear, a ring gear carried by the frame and with which the pinions mesh, means for moving the shaft longitudinally in either direction, means operated by said movement of the shaft for wedging a part of the shaft to the drum, and means actuated by the movement of the shaft in an opposite direction for fastening the gear to a part of the shaft.

2. In a winch of the class described, a supporting member having a pair of uprights, one upright having an annular chamber therein, a shaft having one end journaled in the other upright, a drum having one end journaled on the shaft and said drum having an enlarged bore through which the shaft passes, a gear journaled

on a part of the shaft and having a sleeve extending into the bore, a pair of sectional bushings fitting in the bore and surrounding a part of the shaft, each bushing having a wedge-shaped recess therein, a double wedge carried by the shaft for engaging the recesses for expanding the bushings, one bushing fitting in the sleeve of the gear, an annular row of pinions carried by the drum and engaging the gear, an internal ring gear carried by the supporting member and with which the pinions mesh, the upright having the annular chamber therein being provided with a boss having an internal spiral groove therein, a hub member having a spiral rib thereon engaging the groove, annular grooves and ribs for connecting the hub member with a part of the shaft, a lever pivoted to the hub member for rotating the same for moving the shaft longitudinally, said longitudinal movement of the shaft in one direction causing one bushing to expand against a part of the drum to lock the drum to the shaft and movement of the parts in an opposite direction causing the other bushing to expand against the sleeve of the gear to lock the gear to the shaft.

3. In a winch of the class described, a supporting member having a pair of uprights, one upright having an annular chamber therein, a shaft having one end journaled in the other upright, a drum having one end journaled on the shaft and said drum having an enlarged bore through which the shaft passes, a gear journaled on a part of the shaft and having a sleeve extending into the bore, a pair of sectional bushings fitting in the bore and surrounding a part of the shaft, each bushing having a wedge-shaped recess therein, a double wedge carried by the shaft for engaging the recesses for expanding the bushings, one bushing fitting in the sleeve of the gear, an annular row of pinions carried by the drum and engaging the gear, an internal ring gear carried by the supporting member and with which the pinions mesh, the upright having the annular chamber therein being provided with a boss having an internal spiral groove therein, a hub member having a spiral rib thereon engaging the groove, annular grooves and ribs for connecting the hub member with a part of the shaft, a lever pivoted to the hub member for rotating the same for moving the shaft longitudinally, said longitudinal movement of the shaft in one direction causing one bushing to expand against a part of the drum to lock the drum to the shaft and movement of the shaft in an opposite direction causing the other bushing to expand against the sleeve of the gear to lock the gear to the shaft, a sectional bushing between a portion of the gear and the boss, a wedge for expanding the last mentioned bushing, and means for moving the wedge to operative position when the lever is swung outwardly.

4. In a winch of the class described, a supporting member having a pair of uprights, one upright having an annular chamber therein, a shaft having one end journaled in the other upright, a drum having one end journaled on the shaft and said drum having an enlarged bore through which the shaft passes, a gear journaled on a part of the shaft and having a sleeve extending into the bore, a pair of sectional bushings fitting in the bore and surrounding a part of the shaft, each bushing having a wedge-shaped recess therein, a double wedge carried by the shaft for engaging the recesses for expanding the bushings, one bushing fitting in the sleeve

of the gear, an annular row of pinions carried by the drum and engaging the gear, an internal ring gear carried by the supporting member and with which the pinions mesh, the upright having the annular chamber therein being provided with a boss having an internal spiral groove therein, a hub member having a spiral rib thereon engaging the groove, annular grooves and ribs for connecting the hub member with a part of the shaft, a lever pivoted to the hub member for rotating the same for moving the shaft longitudinally, said longitudinal movement of the shaft in one direction causing one bushing to ex-

pand against a part of the drum to lock the drum to the shaft and movement of the shaft in an opposite direction causing the other bushing to expand against the sleeve of the gear to lock the gear to the shaft, a sectional bushing between a portion of the gear and the boss, a wedge for expanding the last mentioned bushing, and means for moving the wedge to operative position when the lever is swung outwardly, and adjustable guide members for preventing engagement of the last mentioned wedge by the lever until the lever is in a certain position.

EPHRAIM C. S. CLARK.