(No Model.)

H. EKREM.

WINCH.

No. 557,074. Patented Mar. 24, 1896.

Fig. 1.

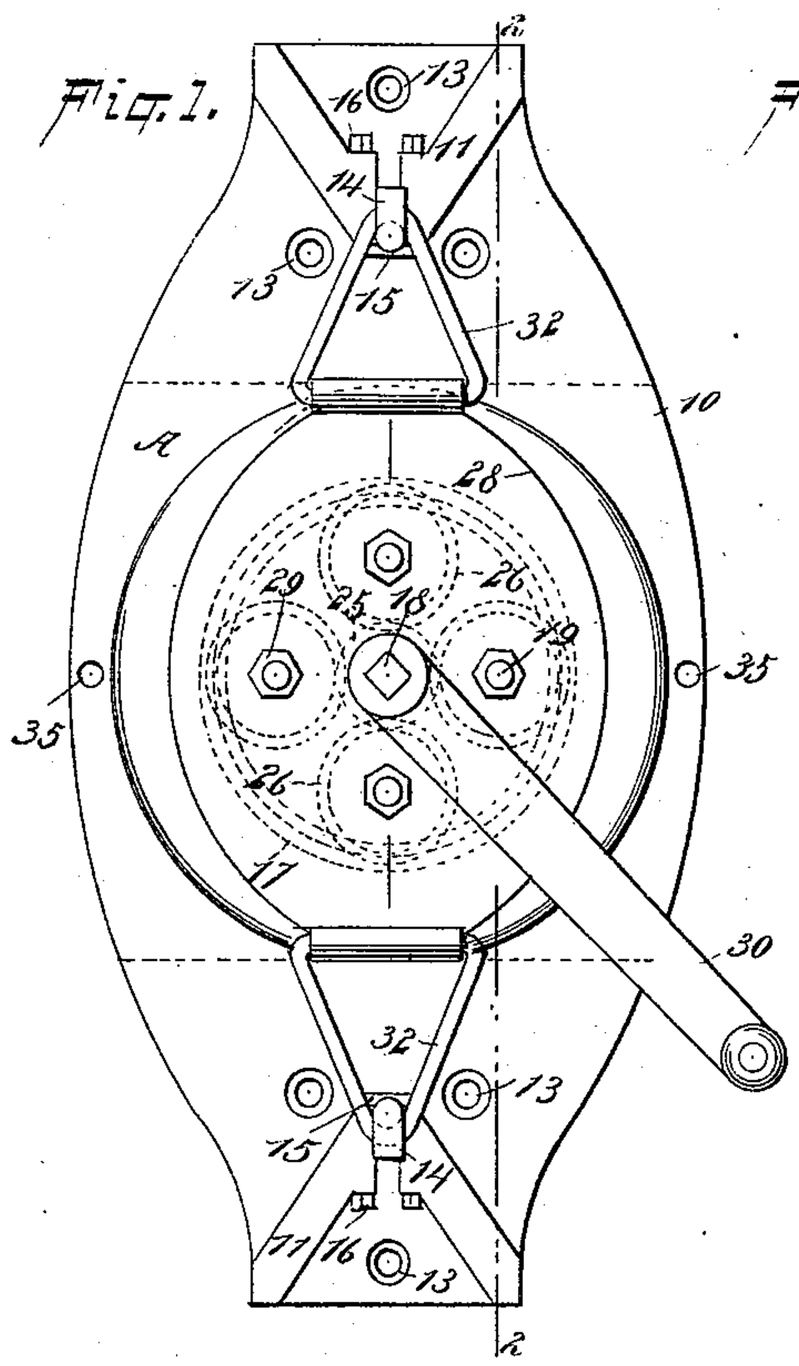


Fig. 2.

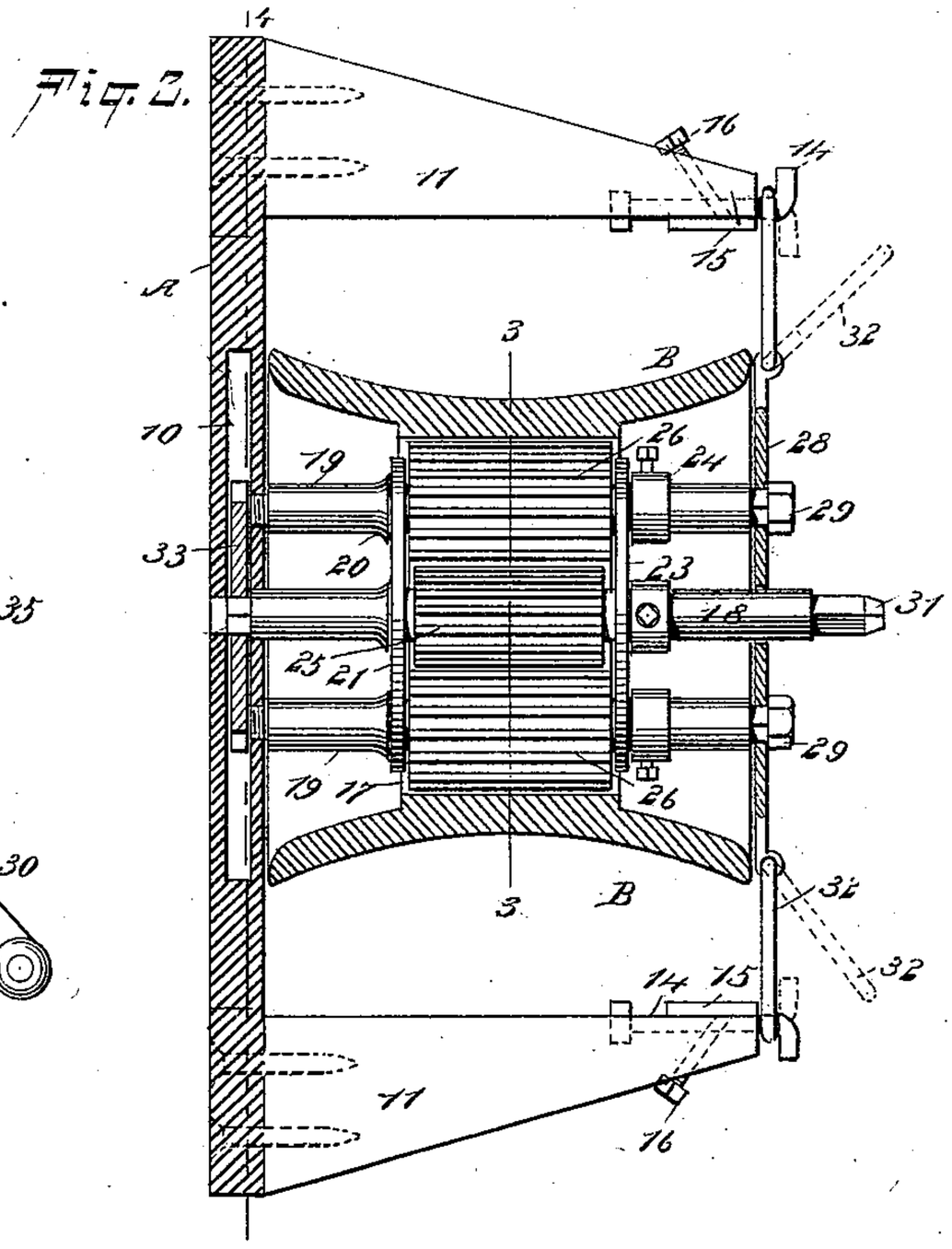


Fig. 3.

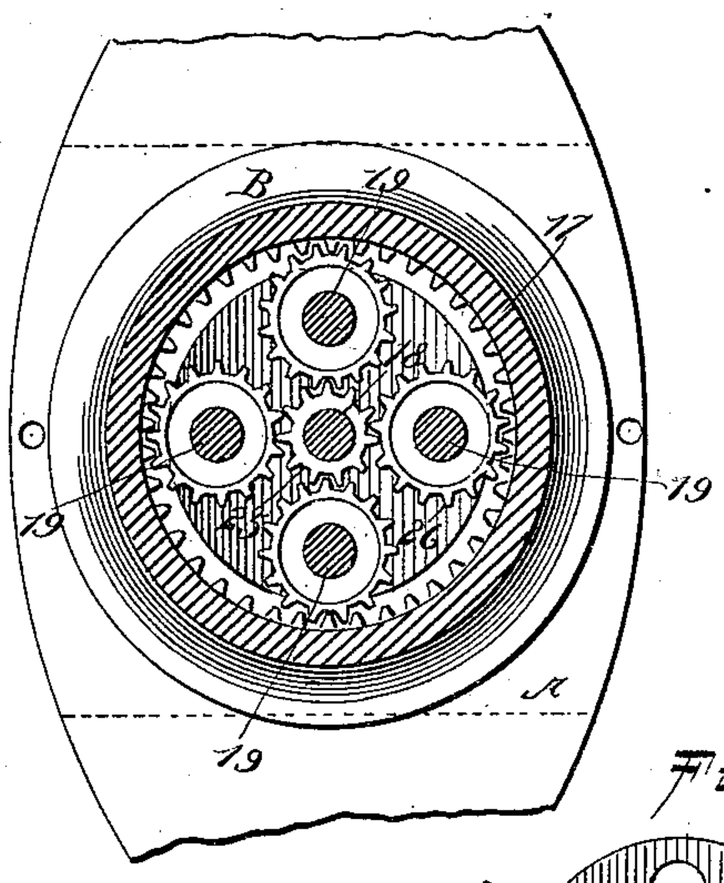


Fig. 4.

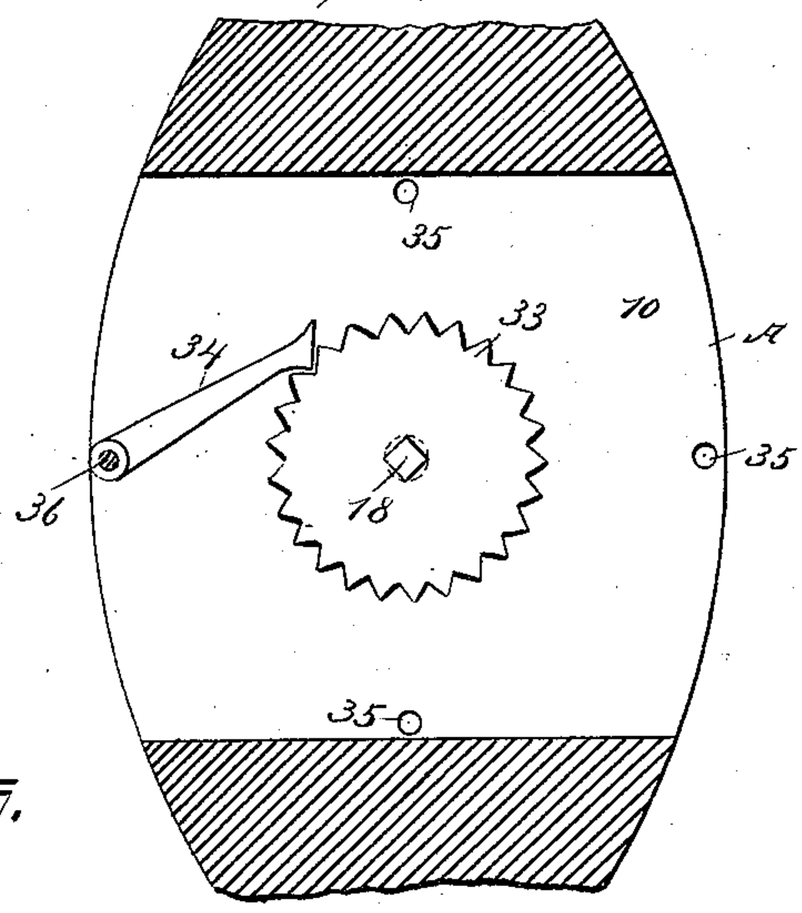
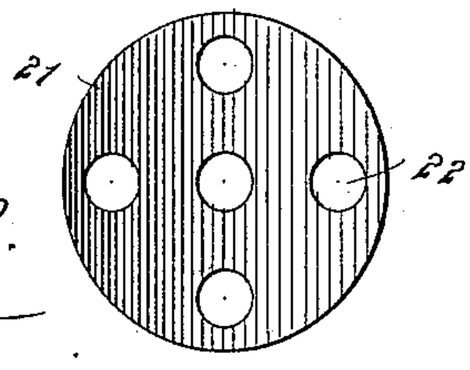


Fig. 5.



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HARRY EKREM, OF SAN PEDRO, CALIFORNIA.

WINCH.

SPECIFICATION forming part of Letters Patent No. 557,074, dated March 24, 1896.

Application filed June 25, 1895. Serial No. 553,985. (No model.)

To all whom it may concern:

Be it known that I, HARRY EKREM, of San Pedro, in the county of Los Angeles and State of California, have invented a new and useful Improvement in Winches, of which the following is a full, clear, and exact description.

My invention relates to an improvement in winches, and has for its object to provide a winch capable of being placed and operated in any position, and especially adapted for use on shipboard in hauling braces, halyards, &c., being adapted for attachment to the railing, bulwark or mast of the vessel, or to any convenient support.

A further object of the invention is to provide a winch of exceedingly simple and durable construction, capable of being expeditiously and conveniently dismantled, and so constructed that through its use one man will be enabled to do the work of many men under ordinary circumstances.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a front elevation of the improved winch. Fig. 2 is a vertical section taken substantially on the line 2 2 of Fig. 1. Fig. 3 is a section through the barrel or drum of the winch, the said section being taken substantially on the line 3 3 of Fig. 2. Fig. 4 is a section taken on the line 4 4 of Fig. 2, and Fig. 5 is a detail view of one of the guide-plates of the winch.

In carrying out the invention a back plate A is constructed of any desired size. Usually, however, the plate is made of less width at the top and bottom than at the center, being somewhat of an oval shape, yet squared at its ends. The back plate A is provided with an interior chamber 10, which extends through the central portion thereof from side to side, as shown in Fig. 2, and upon the front face of the back plate A at top and bottom a horizontal beam or arm 11 is secured, preferably by means of screws or equivalent fastening devices, and the outer longitudinal edges of these arms are ordinarily beveled, so that their front ends are of much less width than their rear ends. The back plate A contains any desired number of openings 13, through which screws may be entered to secure said plate, and consequently the winch, to any desired support.

At the bottom portion of the forward end of the upper arm and of the upper surface of the lower arm 11 a longitudinal cavity is made, and in each of these cavities a bolt 14 is held to turn, the bolts being prevented from dropping out by stay-plates 15 crossing their extremities and held to place by screws 16 or their equivalents. The forward ends of these bolts, or the ends projecting beyond the frame of the winch, are bent so as to extend at an angle to the body, forming hook-arms. Within this frame, and between the top and bottom arms 11, a drum or barrel B is mounted to revolve. This drum or barrel is provided with a concaved exterior surface and with central interiorly-located teeth 17, as shown in Fig. 3. The barrel or drum is hollow and open at its ends, and within it a central shaft 18 is passed, being journaled in the back plate A, and likewise within the drum or barrel, around this central shaft, four stationary shafts 19 are grouped, being arranged preferably at equal distances apart.

The stationary shafts 19 are screwed or otherwise firmly secured at their rear ends in the back plate A, and all of the shafts at the rear side of the teeth 17 in the drum or barrel are provided with collars 20, and a rear guide-plate, 21, is provided, having openings 22, as shown in Fig. 5, to receive all the shafts, and this rear guide-plate is carried to an engagement with the rear collars 20. A second forward or front guide-plate, 23, is likewise provided, of similar construction to the rear guide-plate, 21, and adjustable sleeves 24 are fitted to all of the shafts for practical engagement with the outer face of the said forward guide-plate, as shown in Fig. 2.

The main or central shaft 18 has a pinion 25 cast integral therewith or secured thereto, being located between the guide-plates 21 and 23, while similar pinions 26 are loosely mounted upon the stationary shafts, being similarly located to the pinion of the main shaft with respect to the guide-plates, and the pinions 26 are all in mesh with the pinion 25,

which is the driving-pinion, and the loosely-mounted pinions 26 are also all in mesh with the teeth 17 on the drum, so that when the loosely-mounted pinions are revolved they will in turn impart a rotary motion to the barrel.

The guide-plates, together with the collars 20 and the sleeves 24, serve to prevent the shafts to which they are applied from having any end movement and protect them against the possibility of displacement.

The forward ends of the fixed shafts are squared to pass through correspondingly-shaped openings in the front plate, 28, and their forward ends, which extend beyond this front plate, are fitted with lock-nuts 29, while the main central or driving shaft 18 is mounted to turn loosely in the said front plate, and its forward extremity is squared or rendered polygonal to receive a crank-arm 30, by means of which this shaft is revolved, and the forward extremity of the forward or driving shaft is made tapering, as shown at 31 in Fig. 2, to facilitate the application of the crank 30 thereto, the handle being secured on the shaft by a set-screw or its equivalent, as are likewise the sleeves 24 of all of the shafts.

The front plate, 28, is held in position by attaching to its top and bottom portions yokes or links 32, the attachment being a pivotal one, and these yokes or links receive the outer ends of the bolts 14; and when the hook-arms of these bolts are in the position shown in Fig. 2 the front plate will be held firmly in the position in which it is placed, and yet may be readily removed by turning the hook ends of the bolts in direction of the ends of the plate, as shown in dotted lines in Fig. 2.

The central or driving shaft 18 is prevented from unwinding when the winch is in operation and after the shaft has ceased to revolve by securing on the rear end of the drive-shaft within the chamber 10 of the back plate a ratchet-wheel 33, (shown best in Figs. 2 and 4,) to be engaged by a gravity-pawl 34, pivoted likewise within said chamber, and the chamber is provided with four or more openings or apertures 35 to receive the pivot-pin 36 of the gravity-pawl, in order that this pawl may be shifted to the ends of the frame or to the sides, according to the position in which the winch is to be placed in operation.

By reason of the gearing and peculiar construction of this winch one man, by turning the crank or handle 30, may exert a winding tension on a rope, chain or cable which could not be obtained by the services of many men. The winch is furthermore exceedingly simple, durable and economic in its construction and, as heretofore stated, may be expeditiously and conveniently taken apart whenever it is desirable to do so.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A winch comprising an open stationary frame having a removable front plate, an open-ended hollow drum within said frame and having internal gear-teeth, a series of shafts extending through the drum from end to end secured at their inner ends to the back of the frame, supported at their outer ends in said front plate and provided between their ends with gear-wheels engaging the internal drum-teeth and forming the sole axis or support for the drum, a drive-shaft turning in bearings in the back and end plates and provided between its ends with a fixed gear-wheel meshing with the gears of said fixed shafts, substantially as described.

2. A winch, the same consisting of a back plate adapted for attachment to a support, and arms projected from the back plate in a forwardly direction and provided at their outer ends with locking devices, a removable front plate held in position at its opposite ends by the said locking devices, an internally-toothed drum located between the front and back plates, a driving-shaft journaled in the two plates and provided with a fixed gear, fixed shafts secured in the two plates and grouped around the driving-shaft, each being provided with a loosely-mounted gear meshing with that on the drive-shaft and the teeth on the drum, and means, substantially as shown and described, for locking the driving-shaft and preventing return movement, as and for the purpose set forth.

3. A winch, the same consisting of a back plate adapted for attachment to a support, and arms projected from the back plate in a forwardly direction and provided with locking devices, a front plate held in position by the said locking devices, an internally-toothed drum located between the front and back plates, a driving-shaft journaled in the two plates and provided with a fixed gear, fixed shafts secured in the two plates and grouped around the driving-shaft, each being provided with a loosely-mounted gear meshing with that on the drive-shaft and the teeth on the drum, guide-plates located at each side of the said gears carried by the said shafts, projections on the shafts against which the guide-plates have bearings, a ratchet-wheel secured on the drive-shaft, and a gravity-pawl adjustably pivoted in the frame of the winch and engaging with the said ratchet-wheel, substantially as shown and described.

4. In a winch, the combination, with a back plate adapted for attachment to a support and provided with an interior chamber and upper and lower arms forwardly projected, each arm having a locking device, and a front plate having connection with the said locking devices, of a barrel or drum mounted to revolve between the front and the back plate and provided with internal teeth, a drive-shaft centrally located within the drum and journaled in the front and the back plates, stationary shafts fixed to the said plates and grouped around the drive-shaft, a gear secured to the drive-shaft, gears loosely mounted on the fixed shafts, engaging with the teeth of the

drum and meshing with the fixed gear, guide-plates carried by all the shafts, one at each side of the gears, the rear plate having bearing against fixed projections on the shafts and the forward plate having bearing against adjustable sleeves, a ratchet-wheel secured to the drive-shaft within the chamber of the back plate, and a pawl adjustably pivoted in the said chamber, engaging with the said ratchet-wheel, as and for the purpose specified.

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