Jan. 31, 1928. 1,657,674

E. W. HOLMES

WRECKING CRANE

Original Filed July 14, 1923 2 Sheets-Sheet 1

FIG. 1

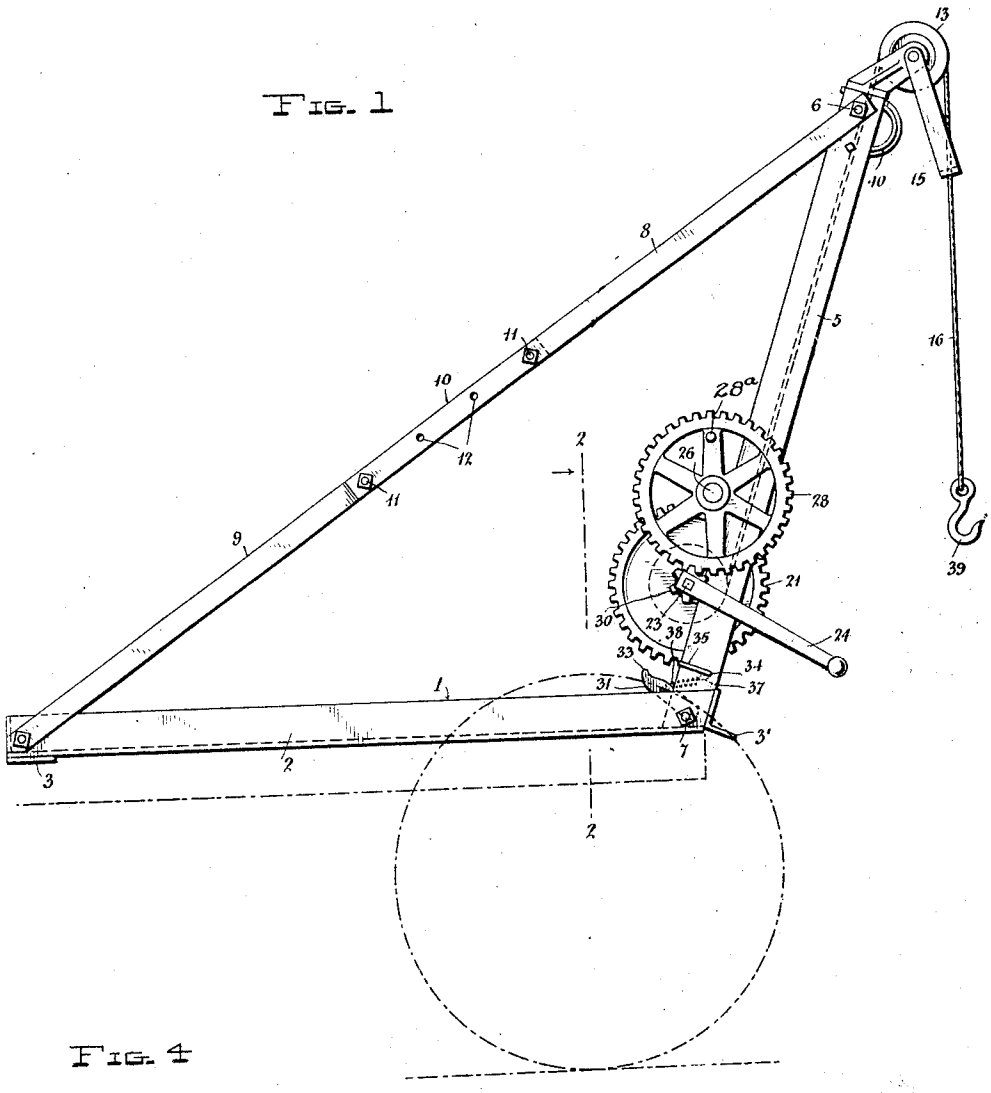
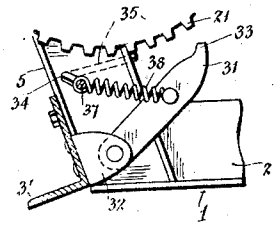


FIG. 4



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Fig. 3

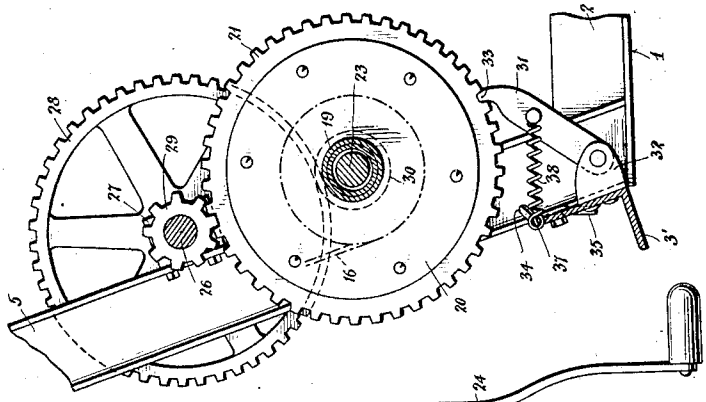
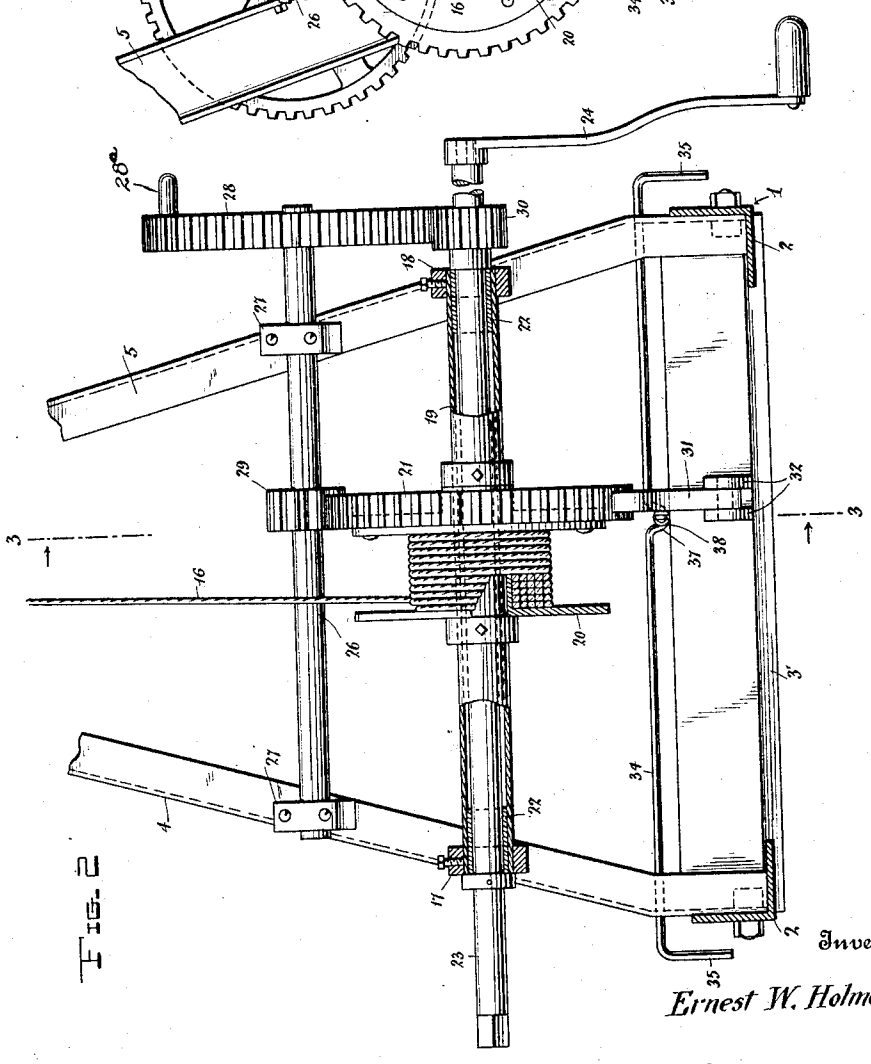


Fig. 2



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Patented Jan. 31, 1928. 1,657,674

UNITED STATES PATENT OFFICE.

ERNEST W. HOLMES, OF CHATTANOOGA, TENNESSEE, ASSIGNOR TO ERNEST HOLMES COMPANY, OF CHATTANOOGA, TENNESSEE, A CORPORATION OF TENNESSEE.

WRECKING CRANE.

Original application filed July 14, 1923, Serial No. 651,584. Divided and this application filed September 30, 1924. Serial No. 740,818.

This invention which is disclosed in application No. 651,584, filed July 14, 1923, of which the present application is a division, relates to wrecking cranes and particularly to a device of the class indicated which may be secured to the chassis of an automobile and thus become a portable crane adapted to the numerous uses incident to the towing of wrecked or disabled automobiles.

One of the objects of the invention is the construction of a crane in which the winding mechanism is carried solely by the boom.

Another object of the invention resides in the provision of means for operating the winding mechanism through different gear ratios, one relatively small, to be used when taking up slack cable, and the other relatively large, for application to the load.

A further object of the invention is to provide safety means for latching the winding mechanism at any point, operable from either side of the crane.

Other objects of the invention will appear as the description of the preferred embodiment thereof develops.

In the drawings:

Figure 1 is a side elevation of a crane embodying the features of the present invention.

Figure 2 is a section taken along the line 2—2 of Figure 1.

Figure 3 is a section taken along the line 3—3 of Figure 2.

Figure 4 is a detail showing the latching means in position of release.

Referring now in detail to the several figures, the numeral 1 represents, in general, the base of the crane which preferably consists of the longitudinal side members 2 and an end member 3 so secured together as to form a rectangular frame open at one end. The boom is mounted across said open end, said boom comprising, preferably, the channel members 4 and 5 which converge upwardly as shown in Figure 2 and are rigidly secured together at their upper ends by means such as the bolts 6 shown in Figure 1. The lower end of the boom may be connected to the longitudinal frame members by means such as the bolts 7 which form a pivotal connection with the base so that the boom may be adjusted to assume various angles of inclination with respect to the base 1. The lower ends of the boom members 4 and 5 are preferably transversely braced by means of the angle iron 3'.

The outer or free end of the boom is tied to the opposite end of the base 1 by means of a pair of tension members 8 and 9, each connected at one end to the outer side of one of the channel members 4 and 5 adjacent the upper ends of the latter, and connected at its opposite end to one of the side members 2 and 3 of the base near the front end thereof. Each of the tension members is divided, the parts thereof being sufficiently long to overlap as shown at 10. The lapped portions are preferably secured together by bolts 11 which may be selectively passed through any of a plurality of aligned apertures 12 in said parts. Not only may the overhang of the crane be adjusted by lengthening or shortening of the tension members, but by separating them entirely the divided parts of said members may be moved into the planes by the base of the boom respectively and the boom may then be folded down upon the base, transforming the crane into a substantially flat article, greatly facilitating its shipment.

It is not necessary to the completeness of the present invention that the crane be furnished with the base as an essential part thereof for the boom and tension members may, if desired, be secured to suitable brackets made fast to the chassis of the auto vehicle upon which the crane is mounted, said chassis itself serving as the base.

The outer end of the boom is furnished with a pulley 13, the same being fully described and claimed in my Patent No. 1,359,379 so that it is not necessary here to dwell upon that portion of the structure except to state that the cable from the winding mechanism passes around said pulley and through a guide 15, the pulley being swiveled so that it may orient itself in the direction of the wreck when the cable is tensioned regardless of the position of the crane.

The winding mechanism is carried in its entirety by the boom. The latter is provided at a convenient height above the base with lugs 17 and 18, in which a sleeve 19 is clampably held by any suitable means such as the set screws. A drum 20 is journalled

upon the outer face of said sleeve, and within the ends of said sleeve are bearings 22 in which is journalled a shaft 23. Said shaft is operated by a detachable hand crank and for that purpose it is provided with polygonal ends extending from opposite sides of the crane. The drum 20 is provided with a gear 21 and the shaft 23 with a gear 30. For transmitting power from the shaft to said drum, a lay shaft 26 is used said lay shaft being journalled in suitable bearings carried by brackets 27 which may be secured to the side members 4 and 5 of the boom. A smaller gear 29 on said lay shaft meshes with the gear on the drum and a large gear 28 on said lay shaft meshes with the smaller gear 30. In this manner a multiplication of power is provided between the shaft 23 and the drum, the gear ratio which I have selected as being best adapted for my commercial machine being 20 to 1. As this produces quite a slow travel of the cable 16 for each revolution of the crank I have found it advantageous to use a smaller gear ratio when winding in slack cable, and for this purpose I have provided the gear 28 with a handle 28ª. A practical ratio between the gear 28 and the drum is four and one-half to one. This makes the taking up of the slack cable quite a speedy operation.

It is to be understood that the use of power means for the hand crank 24 amounts merely to the substitution of one equivalent for another and is within the scope of the invention.

Means is provided for latching the winding mechanism so as to hold the load at any desired point, said means consisting of a pawl 31 pivotally mounted between the lugs 32 or their equivalent, to one of the base members. The free end 33 of said pawl is designed for engagement with the teeth of the gear 21 to prevent a backward or unwinding movement of the drum 20. Said pawl is operated by a rod 34 which extends transversely of the boom and beyond the sides thereof, both ends being provided with handles 35 so that it can be operated by a man standing on either side of the crane. The rod 34 is formed with a crank 37 which is connected to the pawl 31, preferably by a resilient link 38 which in the present illustration takes the form of a spiral spring.

When it is desired to latch the lifting mechanism one of the handles 35 is turned so as to cause the crank 37 to revolve in a counterclockwise direction, viewed from Figure 4 thus exerting a pull upon the resilient link 38 to draw the outer or free end of the pawl into engagement with the teeth of the gear 21. The crank 37 is revolved in this direction until it passes the dead center determined by the line passing through the axis of rotation of the rod 34 and the point at which the resilient link is connected to the pawl 31. In this position the crank 37 rests against the upper edge of the end member 3′, being held there by the pull of the resilient link assisted by the weight of the handles 35.

As shown in Figure 1 a loop 40 is provided adjacent the outer end of the boom for the purpose of engaging the hook 39 which hangs at the outer end of the cable, should it be desired to form a loop in the cable 16 to retain a snatch-block for multiplying the power of the machine.

While I have above described what I have found to be a very practical embodiment of my invention, it is nevertheless to be understood that the wrecking crane may also be exemplified in numerous other alternative constructions and I accordingly reserve the right of adopting all such legitimate changes as may be fairly embodied within the spirit and scope of the invention as claimed.

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

1. A wrecking crane comprising a boom, a sleeve fixed to said boom, a drum and a power shaft journalled, respectively, upon and within said sleeve, the shaft projecting from the ends of the sleeve and having means for operating it from either of its ends, and a train of reduction gearing connecting said power shaft and drum.

2. A wrecking crane comprising a boom, a sleeve fixed to said boom, a drum and a power shaft journalled, respectively, upon and within said sleeve, a train of reduction gearing connecting said power shaft and drum, means for applying power directly to said power shaft, and other means for applying power to an intermediate part of said train of reduction gearing.

3. A wrecking crane including a boom, a winding drum mounted thereupon, a gear wheel for transmitting power to said winding drum, a pawl, said pawl and gear wheel being interengageable to inhibit unwinding movement of said drum, means carried by said boom for moving said pawl into operative relation to said gear wheel and a resilient link connecting said means to said pawl.

4. A wrecking crane including a boom, a winding drum mounted thereupon, a gear wheel for transmitting power to said winding drum, a pawl, said pawl and gear wheel being interengageable to inhibit unwinding movement of said drum, means carried by said boom for moving said pawl into operative relation to said gear wheel and a resilient link connecting said means to said pawl, said means being accessible from both sides of said boom.

5. A wrecking crane including a base, a boom secured thereto, a winding drum journalled on said boom, a toothed gear wheel

connected to said drum for transmitting power thereto, a pawl pivotally mounted upon the crane, and said pawl and gear wheel being interengageable to inhibit unwinding movement of said drum, means for moving said pawl into operative relation to said gear wheel, and a resilient link connecting said means to said pawl, said means being accessible from both sides of said boom.

6. A wrecking crane including a boom, a winding drum mounted thereupon, a gear wheel for transmitting power to said winding drum, a pawl pivotally carried by the crane engageable with the teeth of said gear wheel being interengageable to inhibit unwinding movement of said drum and rotatable means for moving said pawl and gear wheel into interengagement upon the initial rotary movement of said rotatable means and for retaining it in engagement with said gear wheel upon further rotary movement of said rotatable means in the same direction.

7. A wrecking crane including a boom, a winding drum mounted thereupon, a gear wheel for transmitting power to said winding drum, a pawl pivotally carried by the crane engageable with the teeth of said gear wheel being interengagable to inhibit unwinding movement of said drum, rotatable means for moving said pawl and gear wheel into interengagement upon its initial rotary movement of said rotatable means and for retaining it in engagement with said gear wheel upon further rotary movement of said rotatable means in the same direction and a resilient link connecting said pawl and rotatable means.

In testimony whereof I have hereunto set my hand.

ERNEST W. HOLMES.