Oct. 15, 1929. E. W. HOLMES 1,732,047

WRECKING CRANE

Filed Nov. 14, 1924 4 Sheets-Sheet 1

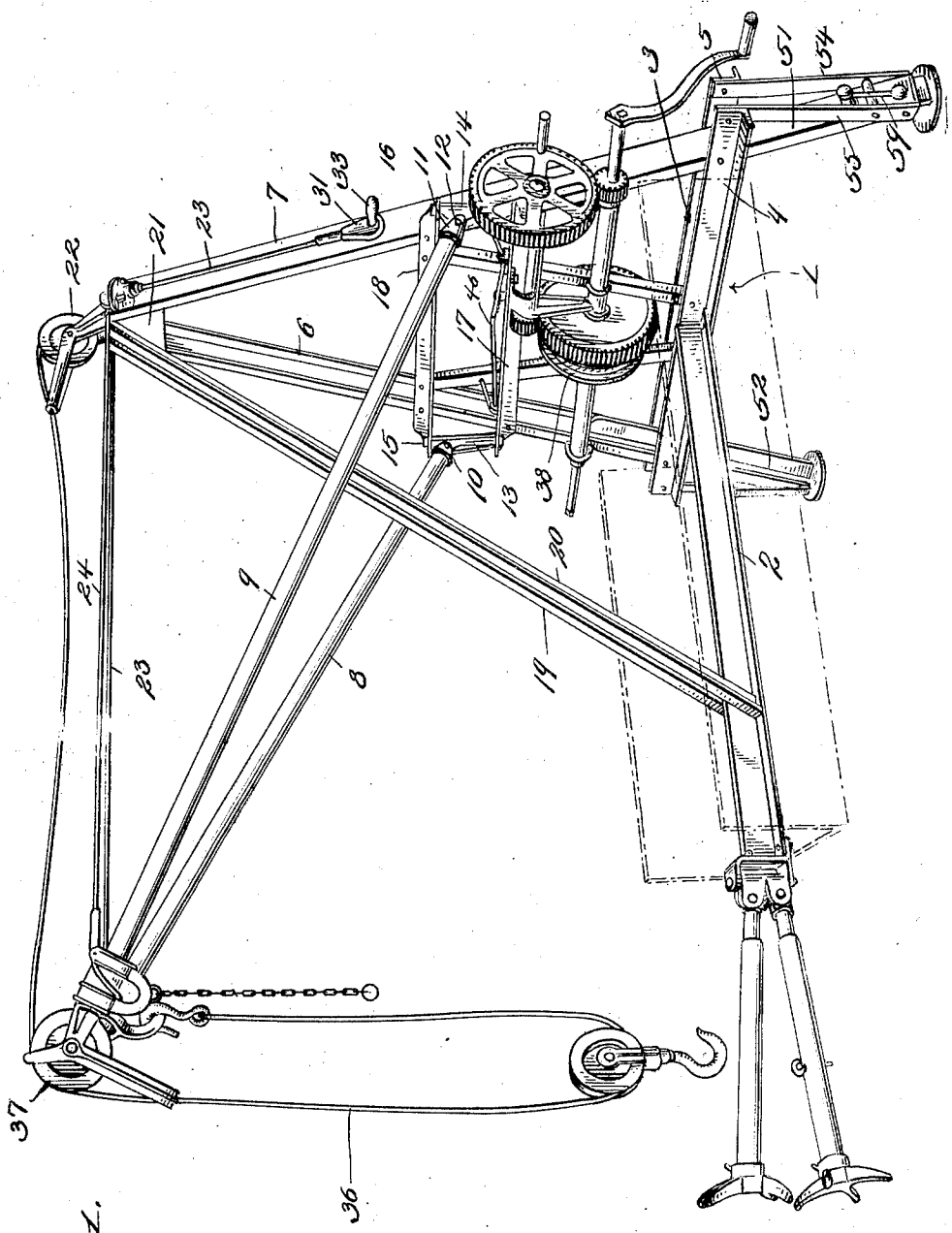


Fig. 1.

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Fig. 3.

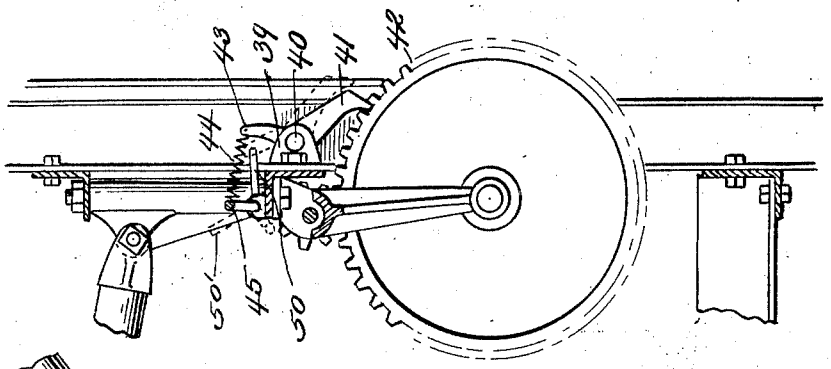
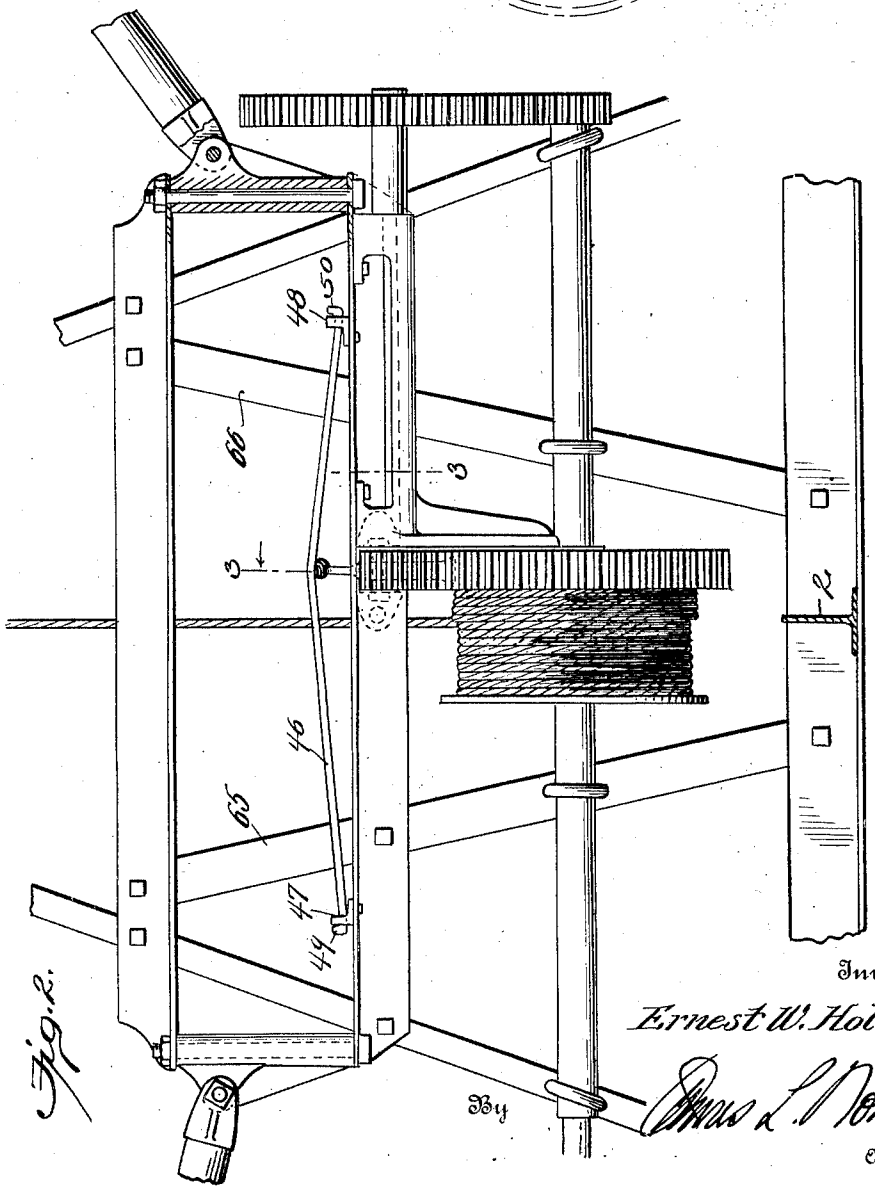


Fig. 2.



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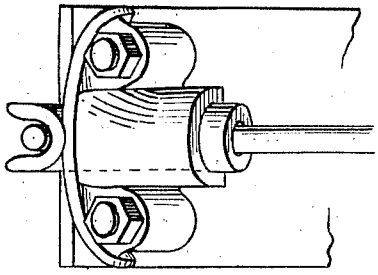


Fig. 6.

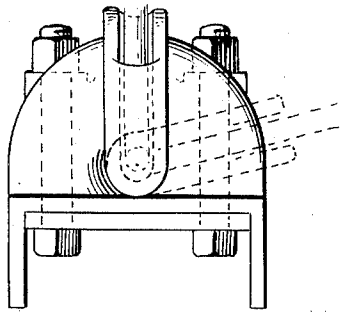


Fig. 7.

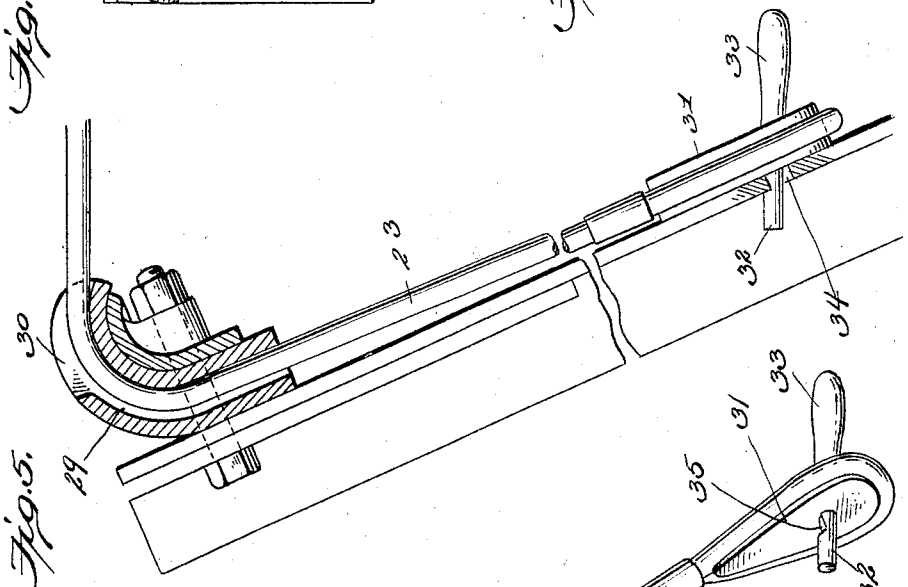


Fig. 5.

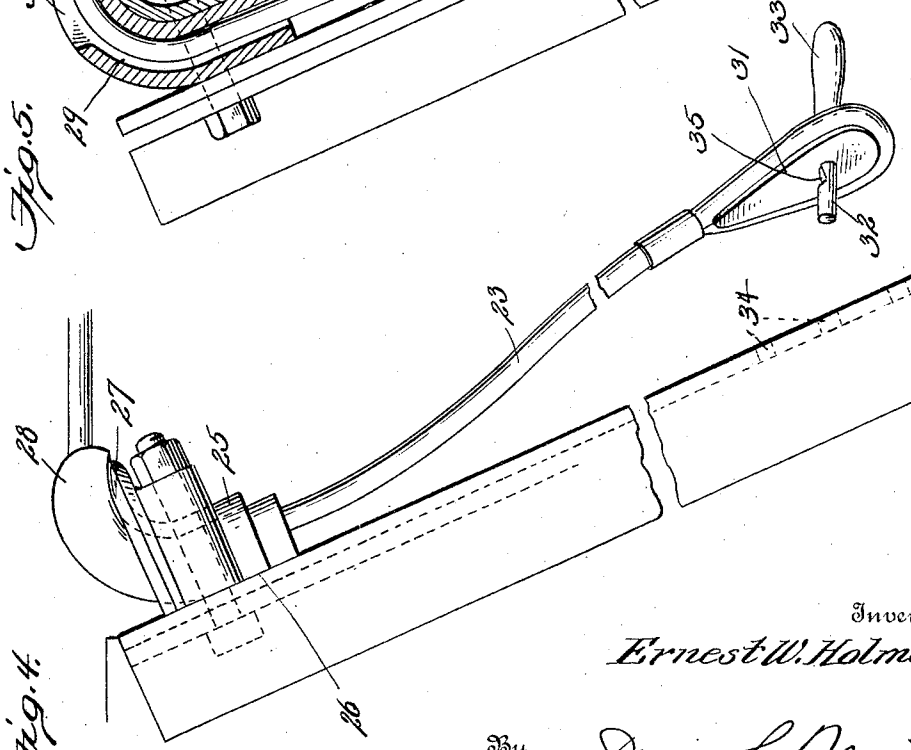


Fig. 4.

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Oct. 15, 1929. E. W. HOLMES 1,732,047

WRECKING CRANE

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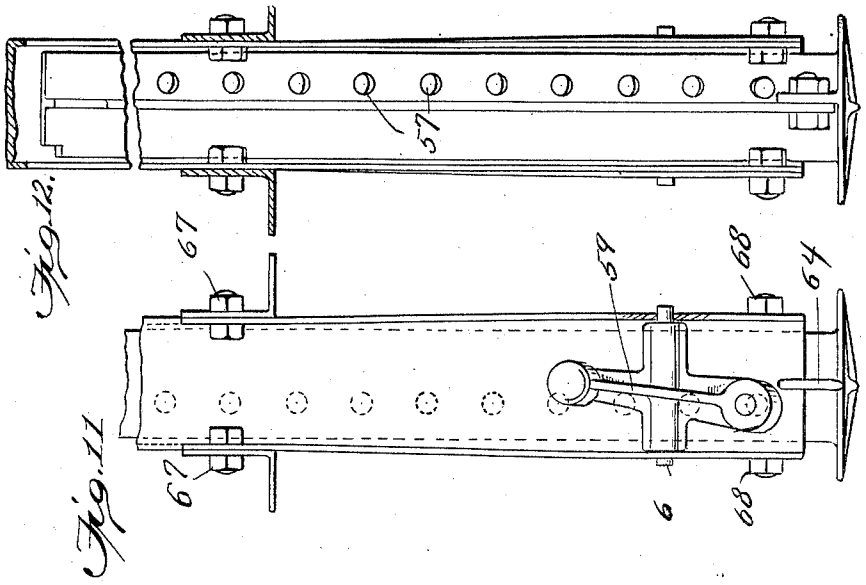


Fig. 12.

Fig. 11.

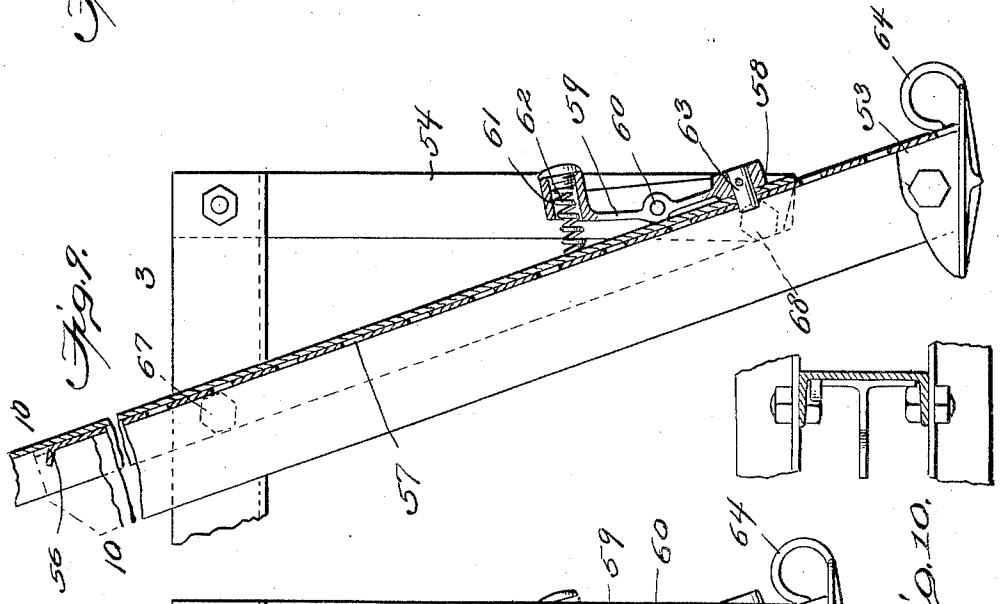


Fig. 9.

Fig. 10.

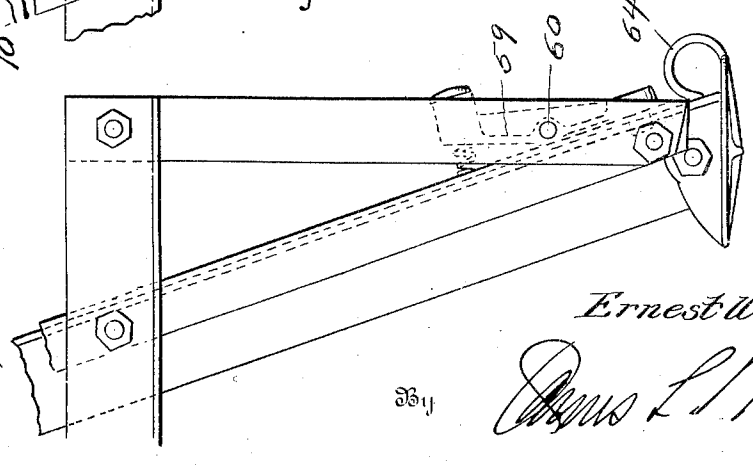


Fig. 8.

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UNITED STATES PATENT OFFICE

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

WRECKING CRANE

Application filed November 14, 1924. Serial No. 749,973.

This invention relates to wrecking cranes for lifting and towing wrecked or disabled automobiles and proposes new and useful combinations and arrangements of parts which render the device superior in strength, simplicity of construction, efficiency, and general adaptability to the uses incidental to its especial field of employment, to wrecking cranes as they have been constructed heretofore.

More specifically, the objects of the invention include the making of improvements in the swinging booms disclosed in my Patent No. 1,359,378 granted November 16, 1920, by which the booms are made adjustable for height.

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

In the drawings which show a preferred embodiment of my invention Figure 1 is a view in perspective of my improved wrecking crane.

Figure 2 is an end view on an enlarged scale, parts being broken away.

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

Figure 4 is a side elevation of a portion of the frame showing the swivel cable guide.

Figure 5 is a similar view showing the cable guide in section.

Figure 6 is a front view of the cable guide.

Figure 7 is a plan view of the same.

Figure 8 is a front elevation showing one of the extensible legs in retracted position relative to the frame.

Figure 9 is a sectional elevation of one of the extensible legs showing the latching means.

Figure 10 is a section taken along the line 10—10 of Figure 9.

Figure 11 is a side elevation of the extensible leg and its latching means.

Figure 12 is a similar view from the opposite side.

Referring now in detail to the several figures, the numeral 1 designates the frame in general which consists of a longitudinal member 2 adapted to be arranged lengthwise of the frame or chassis of an auto vehicle, and to which the transverse member 3 is secured, said longitudinal and transverse members lying in a substantially horizontal plane. The transverse member is preferably formed of spaced angle irons 4 and 5 between which are secured the converging members 6 and 7 constituting the boom-supporting upright. The lower ends of said converging members project below the horizontal plane of the longitudinal and transverse members and therefore below the frame of the auto vehicle chassis but they terminate at a sufficient distance from the ground to provide ample road clearance. Said projecting ends are strengthened by the spaced brace members 54 and 55 to the angle irons 4 and 5. The booms 8 and 9 emanate from sockets 10 and 11 which are pivotally mounted to swing on horizontal axes, by means of bolts 12 which pass through horizontal apertures in said sockets, and in the spindle bodies 13 and 14, the latter being journalled upon vertically arranged spindle bolts 15 and 16. Said spindle bolts constitute the end members of a sub-frame, the top and bottom members of which are preferably formed by the angle irons 17 and 18, said subframe being secured to the converging members 6 and 7 of the boom-supporting upright, and braced by the diagonal struts 65 and 66 which are rigidly fastened to the horizontal members of the subframe and to the transverse member 3. A brace which I prefer to construct of a pair of angle irons 19 and 20 extends diagonally from the longitudinal member 2 to the upper ends of the converging members 6 and 7. The upper end of said brace, as well as the upper ends of said converging members are secured to a head block 21. The head block is provided with a suitable aperture, not shown, in which the swivel pulley 22 is journalled. While it is to be noted that the unitary part of my improved wrecking crane, including the horizontal members, the upright, the sub-frame and the brace are admirably adapted to be fabricated from structural angle iron, the invention is by no means limited to the use of such material it being thoroughly practicable to use tubular or other forms of metallic construction, if desired. The booms are preferably

tubular as in the former wrecker, disclosed in my aforementioned patent.

The booms 8 and 9 are independently supported in elevated position by means of cables 23 and 24 secured to the outer ends of said booms and passing through swivel guides adjacent the top of the converging members 6 and 7, said cables being then secured to said converging members. The swivel guides are illustrated in Figures 4, 5 and 6, each comprising a stationary bracket 25, preferably flat on that side which bolts against the frame as shown at 26 in Figure 4, said bracket being formed with a cylindrical bore which flares outwardly at 27 forming a curved seat for the oscillatably mounted guide plate 28. Said guide plate has a turned-over portion which conforms to the flare of the bracket and is provided with a channel 29 through which the cable passes, the upper portion of said channel being cut away as at 30 adjacent the end of the guide plate 28 to allow for different angular positions assumed by the cable for different degrees of elevation of the boom. The function of the swivel guides is to swing with the cables 23 and 24 when the booms are turned about their vertical axes and their object is to prevent flattening the cables when the boom is under load, which would result should the cables pass around an angular support, and also to prevent chafing or wearing of the cables.

In practice, the height to which the booms should be elevated depends upon the nature of the wreck which is to be lifted. The booms may be independently adjusted for height prior to submitting them to the strain of the load by means shown in Figures 4 and 5, consisting of a grooved thimble-plate 31 for each of the cables 23 and 24 about which the end of the cable is looped as shown, said thimble plate being provided with a fixed pin 32 the inner end of which inclines upwardly. Said fixed pin is preferably made integral with the handle 33 and may be passed through an aperture in the thimble plate and rigidly secured thereto. The pin 32 is adapted to be selectively inserted in any one of a series of apertures 34 formed in the webs of the converging members 6 and 7. When a load is imposed upon one of the booms an upward pull is exerted upon the thimble plate forcing the pin 32 into engagement with the upper wall of the aperture 34 in which it is inserted. The inclined relation of the pin 32 to the surface of the thimble plate ensures that the harder the pull upon the cable the more intimate will be the frictional contact between the pin and the wall of said aperture. I have shown additional means for preventing slippage of the pin from the aperture 34 consisting of a notch 35 formed in the upper side of the pin 32.

In Figure 1 the booms are shown latched together in a manner which is disclosed in said aforementioned patent and the details of which fastening means need not here be described. It is to be understood, however, that in many applications of use the booms are unlatched and oppositely positioned, one boom being anchored to any suitable stationary body for the purpose of steadying the apparatus and the other being connected by means of its hoisting cable to the wreck. The hoisting cable is shown at 36 in Figure 1 and passes over a pulley 37 at the end of one of the booms.

The hoisting mechanism consists of a drum 38 to which the cable 36 is attached at its lower end, said drum and the operating mechanism therefor being covered in my copending application No. 651,584, filed July 14, 1923 and therefore requiring in this application no detailed description except in so far as it relates to the latching mechanism for preventing inadvertent unwinding movement of the drum. This mechanism in the present instance is shown in detail in Figures 2 and 3 and consists of spaced lugs 39 supporting a pin 40 upon which is mounted a pawl 41, the latter engaging teeth in the drum gear 42. Said pawl is formed with an arm 43 on the opposite side of the pin 40 which arm is connected by means of a resilient link 44 to a crank 45 the latter being constituted by a diverted portion of the operating rod 46 as is clearly shown in Figure 2. Said rod rotates in bearings 47 and 48 suitably secured to the members 17 of the sub-frame or to any other convenient stationary part of the structure and is provided outside of said bearings with handles 49 and 50 which can be conveniently reached as well from one side of the crane as from the other. The pawl 41 maintains engaging relation with the drum gear 42 by gravity. When it is desired to lift said pawl, as when paying out cable or lowering the load, one of the handles is swung in a counterclockwise direction as viewed in Figure 3 to the position indicated at 50′, carrying the spring across dead center and thereby maintaining the pawl in position of release even when the handle is let go. While a load is upon the hoisting cable the friction between the engaging faces of the gear teeth and pawl is greater than the tension of the spring 44 so that until the load is purposely taken off of the pawl by turning the drum slightly in a winding direction, it is impossible to make the pawl escape from the gear teeth by operating the handles 49 or 50. This ensures against the inadvertent dropping of the load under all conditions.

As in the case of the wrecking crane described and claimed in my prior patent hereinbefore mentioned the present crane is provided with extensible legs 51 and 52, said legs in the present embodiment of the invention comprising angle irons of T cross-section having suitably shaped feet or base plates

53 secured to the lower ends thereof. Said legs slide within the channel of each of the converging members of the upright being retained in position behind the nuts 67 and 68 by means of which the spaced angle irons 4 and 5 which constitute the transverse member 3, and the braces 54 and 55 are secured to the converging members of the upright. A portion of the upper end of the extensible leg in line with said nuts is struck inwardly as shown at 56 in Figure 9, said struck-in portion forming retaining means for limiting the range of outward extension of said legs by coming in contact with the uppermost of said nuts when the leg is extended to its limit. While the aforesaid nuts and struck-in portion afford a very convenient means for guiding and retaining the extensible leg it is to be understood that other equivalent expedients may be employed without transcending the scope of the invention.

That face of the extensible leg which engages the web of the converging members 4 or 5 is provided with a plurality of apertures 57 adapted to be selectively brought into registry with the single aperture 58 formed in said web. Latching means is provided in the form of rocking lever 59 which is oscillatably mounted upon a pin 60 fixed at its opposite ends in the braces 54 and 55. Said rocking lever is provided with a socket 61 at one end forming a seat for a spring 62 and at the other end is furnished with a pin 63 adapted to project beyond the inner end of the aperture 58. The spring 62 normally biases the rocking lever in a direction to maintain the pin in its projected position. To lower the extensible legs it is merely necessary to press the upper end of the rocking lever which will permit the leg to slide down by gravity until it reaches the ground or any convenient resting place, the rocking lever being then let go. As the tires of the auto vehicle upon which the wrecker is mounted flatten slightly under the imposed load of the wreck being handled, the leg will be pushed upwardly with respect to the converging member until one of the apertures 57 comes into registry with the aperture 58, at which point the pin 63 will automatically spring into said registering aperture holding the extensible leg rigidly against further retraction. As the load upon the auto vehicle increases it is automatically transferred from the tires to the extensible legs, taking all undue strain from the auto vehicle and confining it entirely to the crane structure. When it is desired to retract the legs the rocking lever is moved to depress the spring 62, raising the pin 63. The extensible leg may then be conveniently pulled up to the desired elevation by taking hold of the handle 64. When said handle is released, the extensible leg may gravitate downwardly a short distance until one of the apertures comes into alignment with the pins 63 whereupon the extensible leg will automatically be held securely in elevated position.

Although I have thus described the preferred embodiment of my invention, it is evident that those skilled in the arts to which this relates may make various changes in the construction, combination and arrangement of the several parts without departing from the spirit and scope of the invention.

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

1. In a wrecking crane, upright boom supporting means having a plurality of vertically spaced sockets therein, a boom pivotally connected at one end to said supporting means to swing vertically, a cable secured at one end to said boom toward its free end, a guide mounted on the upper portion of said boom supporting means and over which the intermediate portion of the cable is movable longitudinally, and a handle attached to the other end of the cable and carrying a pin which is selectively engageable with any one of the vertically spaced sockets in said boom supporting means for making step-by-step adjustments of the elevation of the free end of the boom.

2. In a wrecking crane, boom supporting means including a member formed with apertures, a boom carried by said supporting means, a cable secured to said boom and a plate carried by said cable having a projection fixed at an acute angle to the direction of pull on said cable, said projection being selectively engageable with any of said apertures.

3. In a wrecking crane, boom supporting means, a boom pivotally connected thereto and angularly inclinable, an adjusting cable secured to said boom and having a member engageable selectively at any one of a plurality of points with said supporting means, and a cable guide adjacent the upper end of said supporting means in which said cable is slidably retained.

4. In a wrecking crane, an upright member, a normally upwardly inclined boom pivotally connected thereto to swing upon a vertical axis, a cable secured at one end to the free end of said boom and selectively engageable at its other end with a side of said upright member at different points in its height, and a cable guide mounted against a side of said upright member toward the upper end thereof and through which said cable freely passes, for determining a change in the direction of said cable.

5. In a wrecking crane, an upright member, a normally upwardly inclined boom pivotally connected thereto to swing upon a vertical axis, a cable secured to the free end of said boom and adjustably connected to said upright member, and a cable guide

mounted adjacent the upper end of said upright member through which said cable freely passes, for determining a change in the direction of said cable, said guide comprising a socket secured against a side of said upright member and a cable engaging shoe swivelly mounted in said socket.

6. In a wrecking crane, an upright member, a normally upwardly inclined boom pivotally connected thereto to swing upon a vertical axis, a cable secured to the free end of said boom and to said upright member, and a cable guide mounted adjacent the upper end of said upright member through which said cable freely passes, for determining a change in the direction of said cable, said guide comprising a socket secured against a side of said upright member and a cable engaging shoe having a sleeve swivelly mounted in said socket, said shoe having a flared and rounded cable-engaging end above and resting on the socket.

7. A wrecking crane including a boom supporting upright member, a normally upwardly inclined boom pivotally connected thereto to swing on both vertical and horizontal axes, a swivel cable guide mounted adjacent the upper end of said upright member, a cable secured to said boom and passing through said guide and a plate carried by said cable, said plate and said upright member below said guide being formed with interengaging means selectively engageable for adjusting the elevation of said boom.

8. A wrecking crane including a boom supporting upright member, a normally upwardly inclined boom pivotally connected thereto to swing on both vertical and horizontal axes, a swivelled cable guide mounted adjacent the upper end of said upright member, said upright member being provided with a plurality of apertures below said guide, a cable secured to said boom and passing through said guide and a plate carried by said cable having a projection selectively engageable with any of said apertures for adjusting the elevation of said boom.

In testimony whereof I have hereunto set my hand.

ERNEST W. HOLMES.