Dec. 15, 1953 R. ALLENBAUGH 2,662,732

SCAFFOLD HOISTING MECHANISM

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Fig. 2

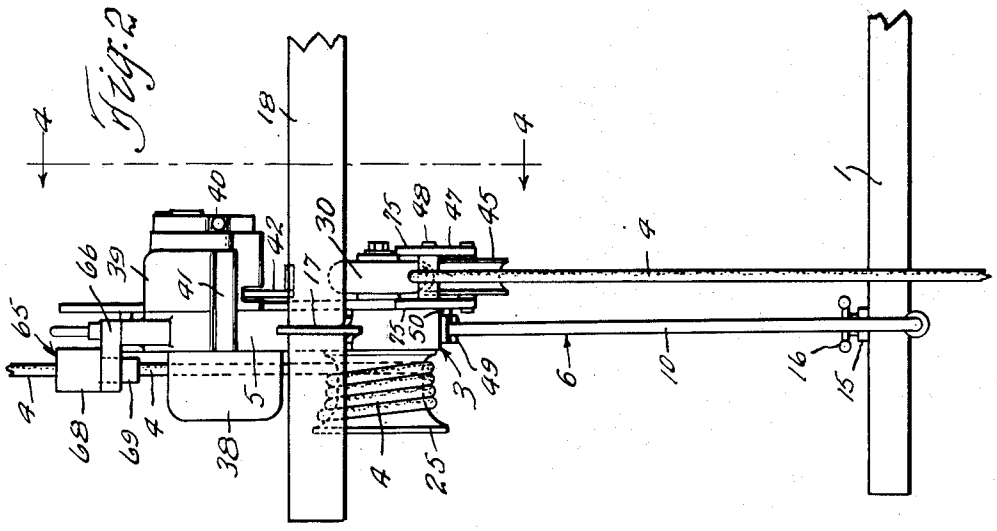


Fig. 1

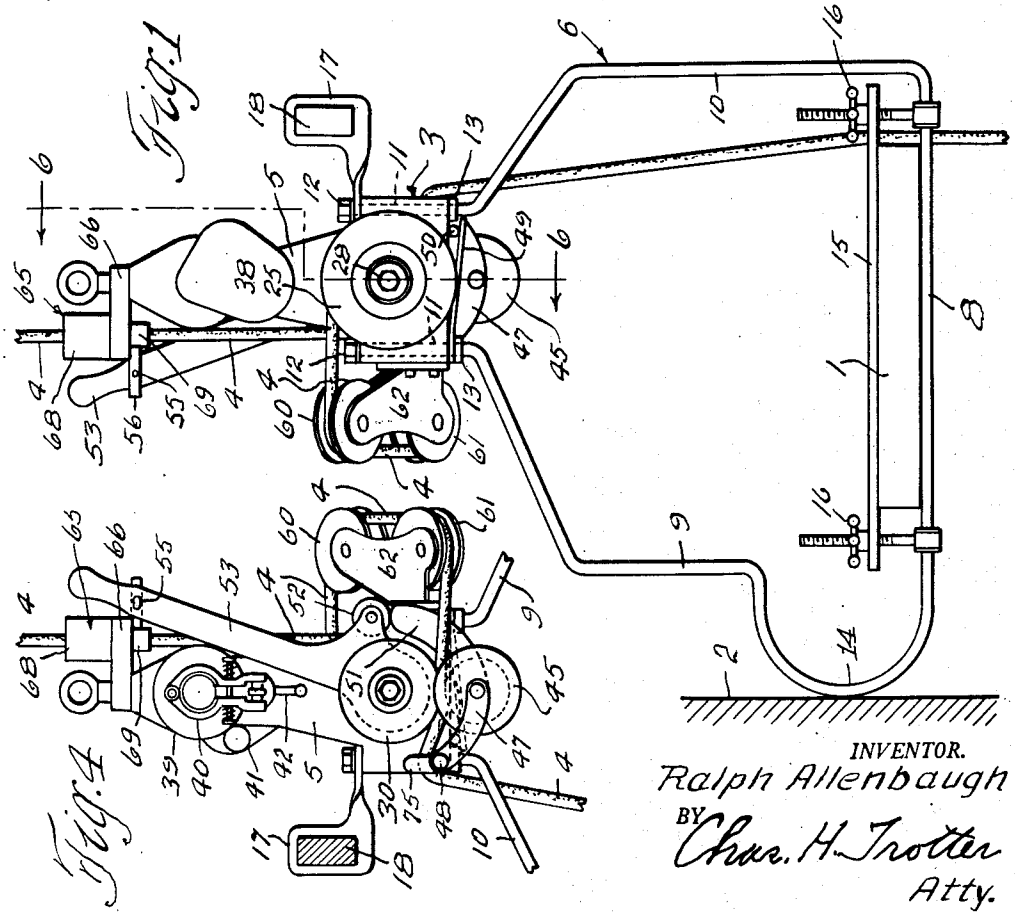


Fig. 4

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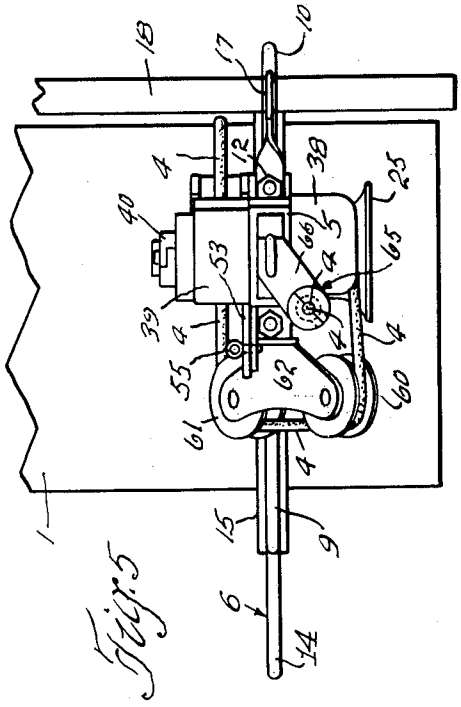


Fig. 5

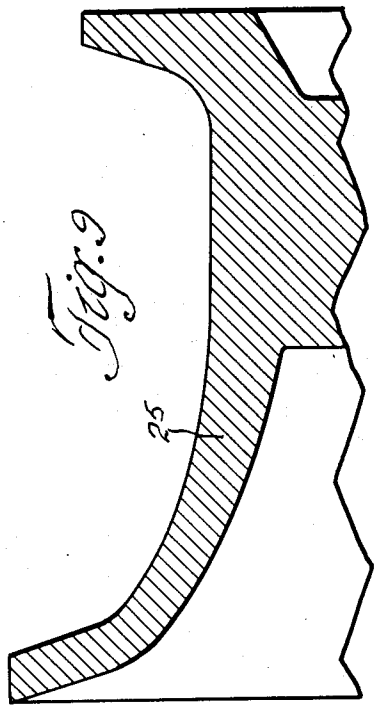


Fig. 2

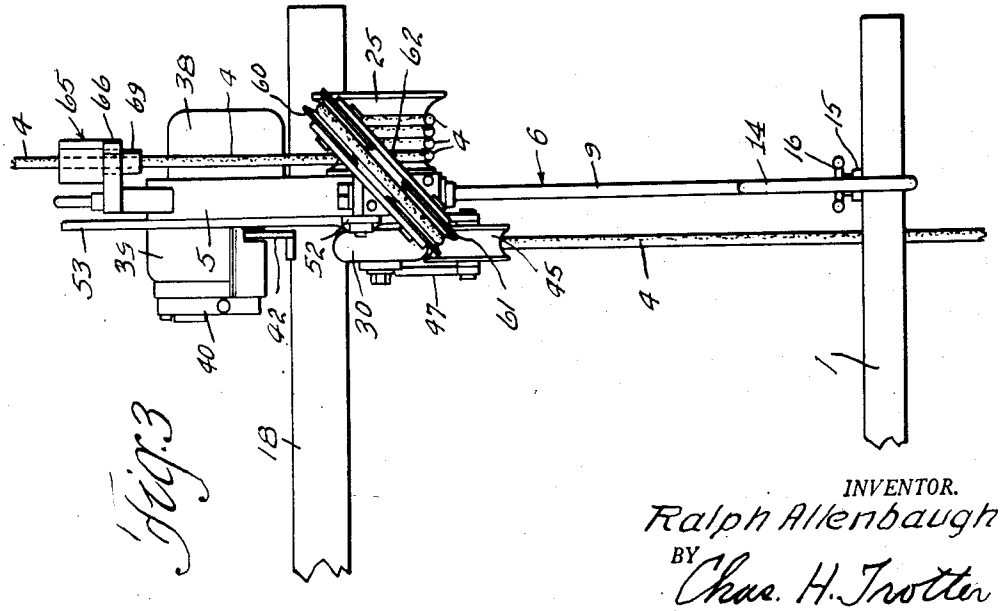


Fig. 3

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SCAFFOLD HOISTING MECHANISM

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Fig. 6

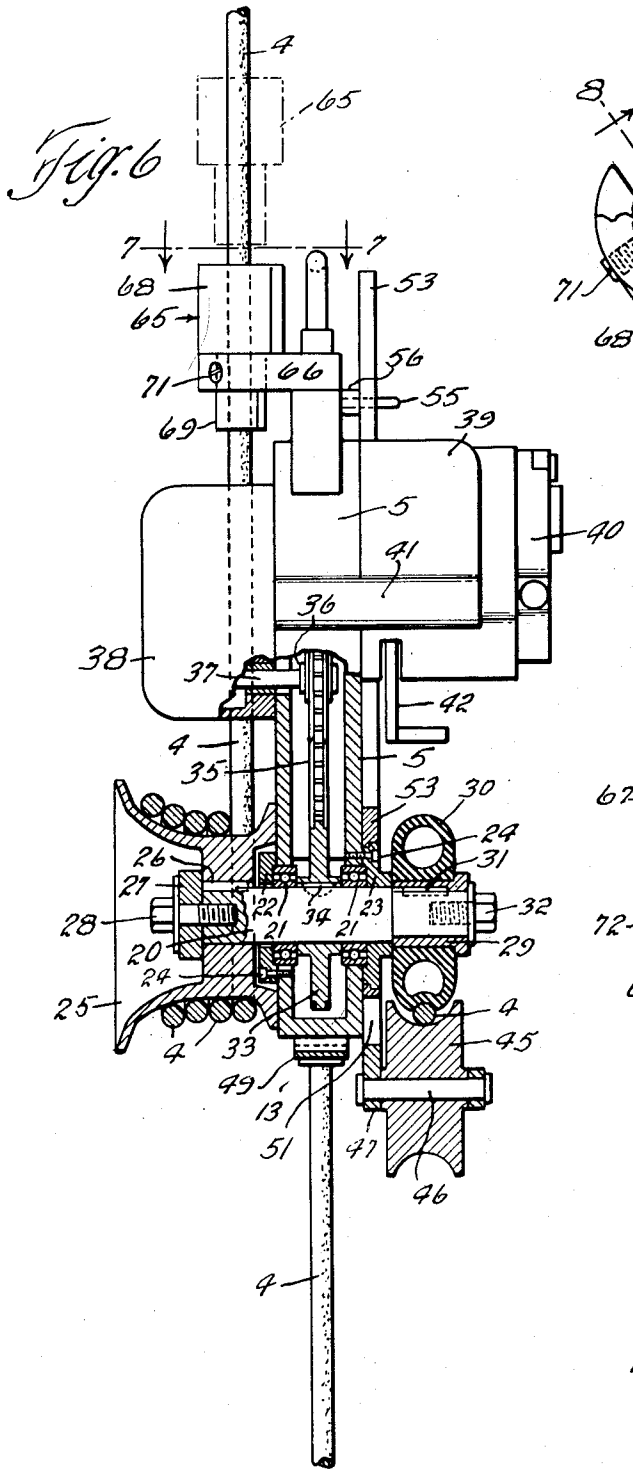
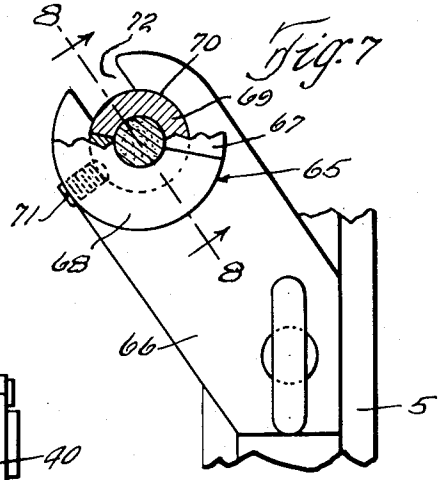


Fig. 7



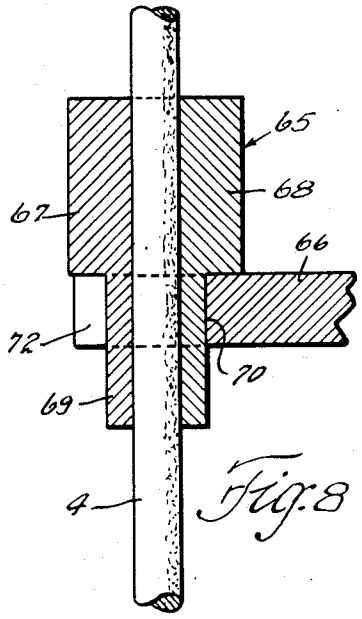


Fig. 8

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Patented Dec. 15, 1953 2,662,732

UNITED STATES PATENT OFFICE

2,662,732

SCAFFOLD HOISTING MECHANISM

Ralph Allenbaugh, Mansfield, Ohio, assignor of one-half to Wilberd F. Feigenbaum, Mansfield, Ohio

Application July 1, 1949, Serial No. 102,488

7 Claims. (Cl. 254—176)

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This invention relates generally to swing stage scaffolds such as are used to support workmen and materials adjacent the exterior of a building or wall while painting or otherwise working thereon. More specifically, the invention relates to a power-operated mechanism by which a swing stage scaffold is supported and is raised and lowered as desired.

According to my invention the scaffolding is adjustably supported by two spaced single strands of rope or cable which are secured to and extend downwardly from suitable supports which are mounted upon and project outwardly from the top of a building or wall. Each end of the scaffold is suitably secured to a power-operated mechanism which in turn is supported by one of the depending ropes or cables. The two power-operated mechanisms are identical in construction and are adapted to be operated independently of each other. Their construction is such that they climb up or down the ropes or cables when the position of the scaffold is being changed. Normally the mechanisms are power-operated in both directions, either up or down, but means are provided whereby they can be lowered by gravity if desired.

The principal object of the invention is to provide a power-operated scaffold hoisting mechanism which is very efficient in operation and which is of simple construction and relatively inexpensive to manufacture.

Another object of the invention is to provide an improved swing stage scaffold which is constructed to be adjustably supported by two spaced single strands of rope or cable.

Another object of the invention is to provide in a power-operated scaffold hoisting mechanism improved means by which the hoisting mechanism can be quickly and easily attached to or detached from a supporting cable.

Other and more limited objects of the invention will be apparent from the following specification and the accompanying drawings forming a part thereof wherein:

Fig. 1 is an end elevation of a swing stage scaffold having my improved supporting and hoisting mechanism incorporated therein;

Fig. 2 is a front elevation of one end of the scaffold shown in Fig. 1;

Fig. 3 is a rear elevation thereof;

Fig. 4 is a sectional elevation taken on the line 4—4 of Fig. 2;

Fig. 5 is a plan view of the device as shown in Figs. 1 to 4 inclusive;

Fig. 6 is an enlarged vertical section taken on the line 6—6 of Fig. 1;

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Fig. 7 is an enlarged detail sectional plan view taken as indicated by the line 7—7 of Fig. 6;

Fig. 8 is a detail vertical section taken on the line 8—8 of Fig. 7; and

Fig. 9 is an actual size fragmentary section taken through the hoisting drum showing the exact contour thereof.

Referring to the drawings by reference characters the numeral 1 indicates a swing stage plank which is adjustably supported for up and down movement adjacent a wall 2 by a pair of identical units, one of which is generally indicated by the numeral 3. The units 3 are each removably secured to a depending cable 4, each of which is secured to an elevated support and hangs down along the wall 2.

Each unit 3 comprises a main frame or casing 5 to which or within which is mounted the entire hoisting mechanism. A stirrup 6, by which the plank 1 is supported is secured to the casing 5 and extends downwardly therefrom. The stirrup 6 is made from round bar stock and consists of a bottom horizontal section 8 and a pair of spaced side sections 9 and 10 which extend upwardly therefrom into apertures 11 in the casing 5 and are held therein by nuts 12 and collars 13. The side 9 has an outwardly extending semicircular section 14 which is adapted to engage the wall 2 to maintain the scaffolding a fixed distance from the wall during use. The plank 1 rests upon the bottom section 8 and is clamped thereto by a clamping bar 15 and a pair of clamping nuts and bolts generally indicated by the numeral 16. The specific construction of the stirrup and plank clamping mechanism forms the subject matter of my copending application Serial No. 102,487, filed July 1, 1949, now Pat. No. 2,639,951.

An outwardly extending bracket 17 by which a guard rail 18 is supported is secured to the casing 5 by one of the nuts 12.

A transverse shaft 20, which extends through the casing 5, is rotatably supported by bearings 21 which are held in place by caps 22 and 23 secured to the casing 5 by studs 24. A drum 25 is keyed to one end of the shaft 20 at 26 and is removably secured thereon by a spacer 27 and studs 28. A hub 29, having a resilient deformable rubber tire 30 vulcanized thereon, is removably secured to the other end of the shaft 20 by a key 31 and a stud 32. A sprocket 33 is keyed to the shaft 20 between the bearings 21 within the casing 5 as indicated at 34.

The shaft 20 is driven through the sprocket 33 by a chain 35 from a sprocket 36 which is secured to the end of a shaft 37 which extends into the main casing 5 from a reduction gear

casing 38 suitably secured to one side of the main casing 5. The shaft 37 is driven through a standard reduction gearing within the casing 38 from a reversible motor 39 secured to the opposite side of the casing 5. A brake 40 is provided to instantly stop the rotation of the motor armature shaft when current to the motor is cut off. The operation of the motor is controlled by a switch mechanism 41 which is operated by a lever 42. As the lever 42 is moved to cause operation of the motor 39 in either direction it releases the brake 40 and holds it released during the operation of the motor. The motor, reduction gearing, and the motor controls are of standard well known construction which are manufactured as a single power unit by various manufacturers.

An idler pulley 45 is rotatably mounted, below the tire 30, on a shaft 46 carried by a U-shaped bracket 47 which is pivotally mounted upon a stud 48 extending out from one side of the casing 5. The bracket 47 is yieldingly held up in the position shown by a flat leaf spring 49 which is secured to the underside of the casing 5 by one of the collars 13. The free end of the spring 49 engages under a pin 50, which is secured to the bracket 47 and extends outwardly therefrom under the casing 5, and normally holds the pin 50 up against the underside of the casing 5 which limits the upward movement of the bracket 47 and the pulley 45 carried thereby. The bracket 47 has secured thereto an arcuate arm 51 which extends forwardly and upwardly against one side of the casing 5. The arm 51 is adapted to be engaged by a roller 52 which is carried by a lever 53 which is pivotally secured beside the casing 5 by the cap 23 as shown in Figs. 4 and 6. When the lever 53 is moved in a clockwise direction from the position shown in Fig. 4 the roller 52 will engage and depress the arm 51 which will move the free end of the bracket 47 and the pulley 45 downwardly away from the tire 30 for purposes to be hereinafter described. The lever 53 is normally held up in the position shown in Fig. 4 by a pin 55 which secures the lever 53 to a fixed arm 56.

A pair of grooved pulleys 60 and 61 are rotatably supported by a bracket 62 which is secured to and extends outwardly from the rear of the casing 5. The pulleys 60 and 61 are disposed at an angle across the back of the unit as is shown best in Fig. 3.

A guide sleeve generally indicated by the numeral 65 is carried by an arm 66 which is suitably secured to the top of the casing 5 and extends rearwardly and to one side thereof. The sleeve 65 is made in two half sections 67 and 68 and has a vertical bore therethrough which is substantially the same diameter as the diameter of the rope or cable 4. The lower reduced cylindrical end 69 of the sleeve extends down through an aperture 70 in the arm 66 and is removably secured therein by a set screw 71. The end of the arm 66 is slotted as indicated at 72. The width of the slot 72 is less than the diameter of the aperture 70, but is slightly greater than the diameter of the rope or cable 4.

To secure the unit 3 to the cable 4, the sleeve 65 is first removed from the aperture 70 and the rope or cable 4 inserted therein through the slot 72. The sleeve 65 is then placed around the rope or cable 4 above the arm 66 as shown in dotted lines in Fig. 6, after which it is moved downwardly along the cable 4 and into the aperture 70 where it is fastened by the set screw 71. The cable 4 is then wound about the drum 25 for four or five turns. From the drum 25 the cable extends rearwardly around the pulley 60, and then downwardly and inwardly around the pulley 61. From the pulley 61 the cable extends forwardly over the pulley 45 and under the tire 30. In order to insert the cable between the pulley 45 and the tire 30 the pulley 45 is first moved away from the tire 30 by the lever 53 in the manner previously described. The cable is then moved sidewise under the tire 30 and the lever 53 released. The spring 49 then returns the pulley 45 back to normal position which tightly grips the cable 4 between the pulley 45 and the tire 30. From the pulley 45 the cable extends over the rear end of the bracket 47 between guide fingers 75 extending upwardly therefrom, and then hangs freely downwardly.

In operation, when the drum 25 is driven in a counterclockwise direction, as viewed in Fig. 1, the unit 3 raises itself up along the rope or cable 4; and when the drum is driven in a clockwise direction the unit lowers itself down the rope or cable 4. During raising the cable 4 is wound onto the inner end of the drum 25, adjacent the casing 5, and is withdrawn from the outer end thereof. The tire 30 and the pulley 45 are provided to withdraw the cable from the drum 25 during raising and to maintain the cable between the drum 25 and pulley 45 taut at all times. The drum 25 and the tire 30 are so proportioned with respect to each other that the cable will always be withdrawn from the drum 25 at the same linear speed at which it is wound thereon. To insure tautness of the cable at all times the diameter of the tire 30 is preferably such that there is a slight slippage between the tire and cable during operation. During lowering the cable 4 is fed onto the drum at the outer end thereof and leaves the drum at the inner end thereof. The pull upon the cable 4 necessary to maintain it taut between the drum 25 and pulley 45 is very slight, being at the most two or three pounds.

The shape and size of the drum 25 may be varied, but I have found that a drum having a hard polished surface of the contour shown in Fig. 9 gives the best results.

From the foregoing it will be apparent to those skilled in this art that I have provided a very simple and efficient mechanism for accomplishing the objects of my invention.

It is to be understood that I am not restricted to the specific construction shown and described herein as various modifications may be made thereto within the spirit of the invention.

What is claimed is:

1. In a hoisting mechanism adapted to move up and down a suspended cable the combination of a frame; a guide sleeve secured to said frame; a shaft rotatably supported by said frame below said guide sleeve; power means by which said shaft is rotated carried by said frame; a drum rigidly secured to one end of said shaft; a pulley rigidly secured to the other end of said shaft; said cable being adapted to extend down through said guide sleeve and around said drum a plurality of turns and then under said pulley; and means operative to hold said cable in engagement with said pulley.

2. In a hoisting mechanism adapted to move up and down a suspended cable the combination of a frame; a guide sleeve secured to said frame; a shaft rotatably supported by said frame below said guide sleeve; power means by which said shaft is rotated carried by said frame; a drum

rigidly secured to one end of said shaft; a driving pulley rigidly secured to the other end of said shaft; a guide pulley rotatably mounted on said frame; said cable being adapted to extend down through said guide sleeve and around said drum a plurality of turns and then over said guide pulley and under said driving pulley; and means operative to hold said cable in engagement with said driving pulley.

3. A hoisting mechanism of the character described comprising a suspended cable having the upper end thereof secured to an elevated supporting member, a casing, a shaft rotatably mounted in said casing with the ends thereof extending out from said casing, a drum rigidly secured to one end of said shaft, a pulley rigidly secured to the other end of said shaft, a driven sprocket through which said shaft is rotated rigidly secured to said shaft between said drum and said pulley, means operative to drive said sprocket carried by said casing, cable guide means secured to said casing above said shaft, said cable extending down through said guide means and around said drum a plurality of turns and then into peripheral engagement with said pulley, and means operative to maintain said cable in engagement with said pulley during operation.

4. A hoisting mechanism of the character described comprising a suspended cable having the upper end thereof secured to an elevated supporting member, a casing, a shaft rotatably mounted in said casing with the ends thereof extending out from said casing, a drum rigidly secured to one end of said shaft, a pulley rigidly secured to the other end of said shaft, a driven sprocket through which said shaft is rotated rigidly secured to said shaft between said drum and said pulley, means operative to drive said sprocket carried by said casing, cable guide means secured to said casing above said shaft, said cable extending down through said guide means and around said drum a plurality of turns and then into peripheral engagement with said pulley, means operative to maintain said cable in engagement with said pulley during operation, and means by which said cable is guided from said drum into engagement with said pulley.

5. A hoisting mechanism of the character described comprising a suspended cable having the upper end thereof secured to an elevated supporting member, a casing, a shaft rotatably mounted in said casing with the ends thereof extending out from said casing, a drum rigidly secured to one end of said shaft, a pulley rigidly secured to the other end of said shaft, a driven sprocket through which said shaft is rotated rigidly secured to said shaft between said drum and said pulley, means operative to drive said sprocket carried by said casing, cable guide means secured to said casing above said shaft, said cable extending down through said guide means and around said drum a plurality of turns and then into peripheral engagement with said pulley, means operative to maintain said cable in engagement with said pulley during operation, and means by which said cable is guided from said drum into engagement with said pulley, said last mentioned means including an idler pulley mounted upon said casing.

6. A hoisting mechanism of the character described comprising a suspended cable having the upper end thereof secured to an elevated supporting member, a casing, a shaft rotatably mounted in said casing with the ends thereof extending out from said casing, a drum rigidly secured to one end of said shaft, a pulley rigidly secured to the other end of said shaft, a driven sprocket through which said shaft is rotated rigidly secured to said shaft between said drum and said pulley, means operative to drive said sprocket carried by said casing, cable guide means secured to said casing above said shaft, said cable extending down through said guide means and around said drum a plurality of turns and then into peripheral engagement with said pulley, a bracket pivotally secured to said casing, an idler pulley carried by said bracket in alignment with said first mentioned pulley, and resilient means biasing said idler pulley towards said first mentioned pulley, said idler pulley being operative to maintain said cable in engagement with said first mentioned pulley during operation.

7. A hoisting mechanism of the character described comprising a suspended cable having the upper end thereof secured to an elevated supporting member, a casing, a shaft rotatably mounted in said casing with the ends thereof extending out from said casing, a drum rigidly secured to one end of said shaft, a pulley rigidly secured to the other end of said shaft, a driven sprocket through which said shaft is rotated rigidly secured to said shaft between said drum and said pulley, means operative to drive said sprocket carried by said casing, cable guide means secured to said casing above said shaft, said cable extending down through said guide means and around said drum a plurality of turns and then into peripheral engagement with said pulley, a bracket pivotally secured to said casing, an idler pulley carried by said bracket in alignment with said first mentioned pulley, resilient means biasing said idler pulley towards said first mentioned pulley, said idler pulley being operative to maintain said cable in engagement with said first mentioned pulley during operation, and means including a manually operable pivoted lever operative to move said idler pulley away from said first mentioned pulley to release said cable from said first mentioned pulley.

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References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
344,306	Chambers	June 22, 1886
1,328,500	Donaldson	Jan. 20, 1920
1,685,015	Aycock	Sept. 18, 1928
2,508,187	Niemiec	May 16, 1950

FOREIGN PATENTS

Number	Country	Date
5,906	Great Britain	Apr. 6, 1891
306,689	Italy	Mar. 29, 1933