

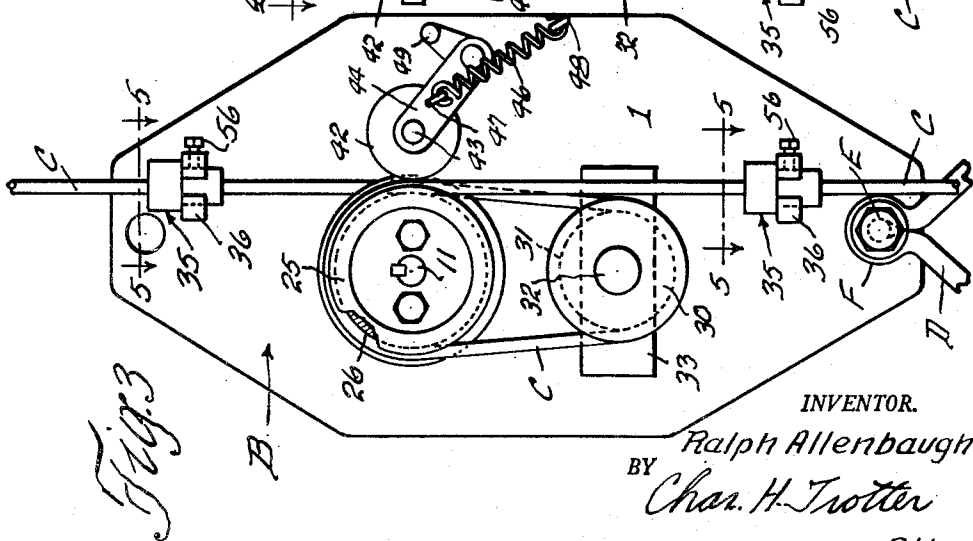
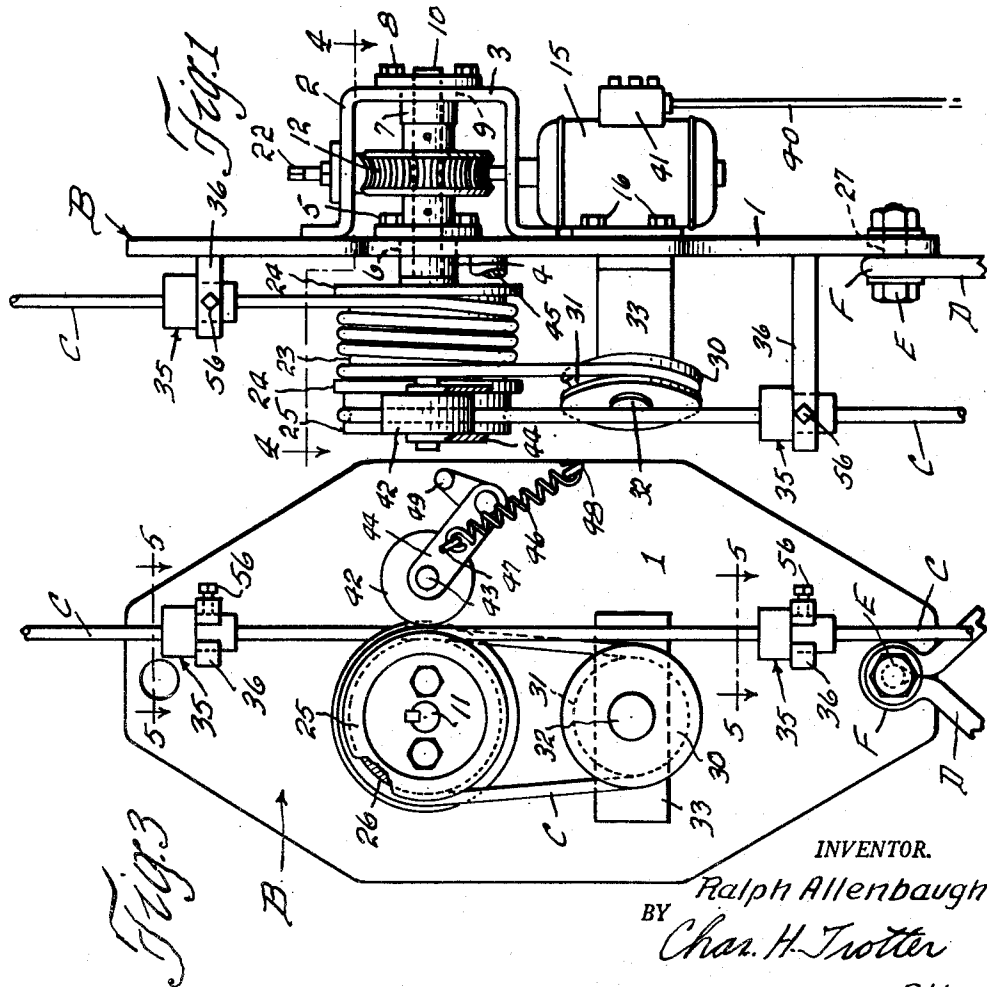
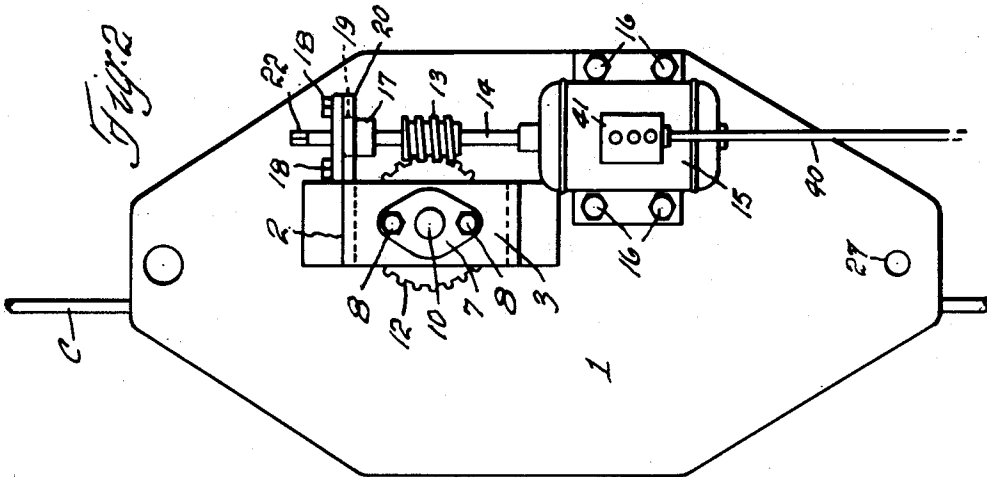
Dec. 15, 1953

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SCAFFOLD HOISTING MECHANISM

2,662,733

Filed Nov. 6, 1950

2 Sheets-Sheet 1



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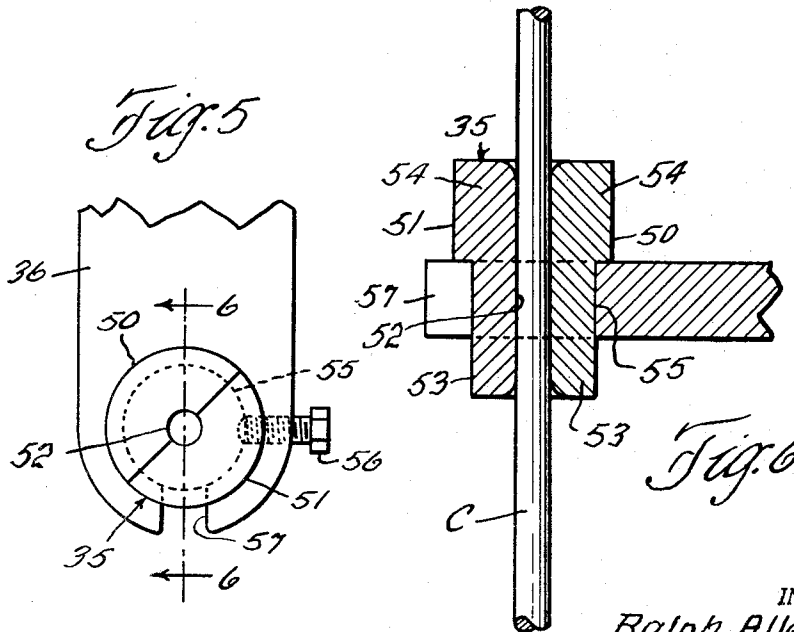
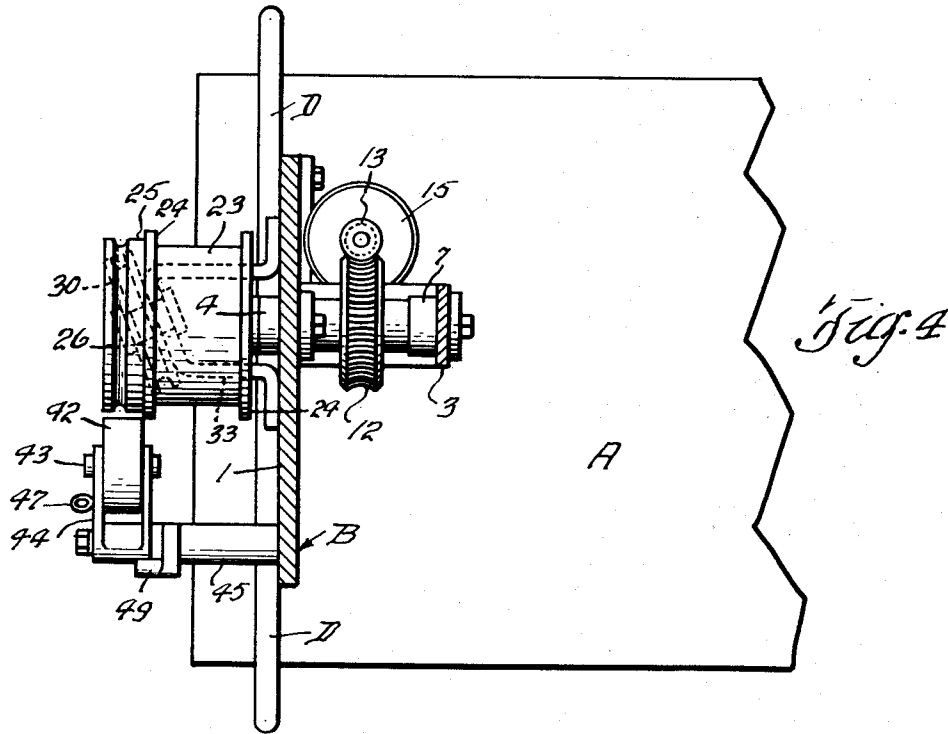
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UNITED STATES PATENT OFFICE

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SCAFFOLD HOISTING MECHANISM

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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 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 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 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. The mechanisms are power operated in both directions, either up or down.

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.

Another object of the invention is to provide a power operated scaffold hoisting mechanism which can be easily attached to and detached from existing swing stage stirrups.

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 a front elevation of my improved swing stage scaffold hoisting mechanism;

Fig. 2 is a side elevation thereof, as viewed from the right of Fig. 1;

Fig. 3 is a side elevation thereof, as viewed from the left of Fig. 1;

Fig. 4 is a horizontal section, taken on the line 4—4 of Fig. 1;

Fig. 5 is an enlarged detail section, taken on either of the lines 5—5 of Fig. 3, and

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Fig. 6 is a vertical section, taken on the line 6—6 of Fig. 5.

Referring now to the drawings by reference characters, the letter A indicates a swing stage plank which is adjustably supported for up and down movement adjacent a wall by a pair of identical hoisting units, one of which is generally indicated by the letter B. The hoisting units B are each removably secured to a depending cable C, each of which cables is secured to an elevated support and hangs down therefrom.

Each unit B comprises a frame 1 which as shown consists of a flat metal plate to which the entire hoisting mechanism is secured. A stirrup D which supports the plank A is removably secured to the lower end of the frame 1 by a bolt E which extends through the eye F of the stirrup and an aperture 27 in the frame or plate 1.

Suitably secured to one side of the frame 1, as by welding, is a U-shaped bracket 2, the base 3 of which is disposed parallel to the frame 1. An anti-friction bearing 4 is removably secured by studs 5 in an aperture 6 in the frame 1; and a similar bearing 7 is removably secured by studs 8 in an aperture 9 in the base 3 of the bracket 2, in axial alignment with the bearing 4. A shaft 10 is rotatably mounted in the aligned bearings 4 and 7, with one end 11 thereof extending out beyond the frame 1 on the side opposite the bracket 2. A worm gear 12 is rigidly secured to the shaft 10 between the bearings 4 and 7, and meshes with a worm 13 which is keyed to the armature shaft 14 of a reversible motor 15 which is bolted to the frame 1 as indicated at 16. The outer end of the armature shaft 14 is rotatably mounted in a bearing 17 which is removably secured by studs 18 in an aperture 19 in an arm 20 which extends out from the bracket 2. The projecting end of the shaft 14 is squared as shown at 22 for the reception of a hand crank by which the mechanism can be manually operated in the event of a current or motor failure. A drum 23 having end flanges 24, and a tension pulley 25 having an annular groove 26 in the periphery thereof, are keyed onto the projecting end 11 of the shaft 10 with the drum 23 adjacent the bearing 4 and frame 1. If desired the pulley 25 may be formed integrally with the drum 23. The diameter of the bottom of the groove 26 is the same as the diameter of the drum 23, so that they will both have the same peripheral speed when rotated. An idler pulley 30, having an annular groove 31 in the periphery thereof, is rotatably mounted beneath the drum 23 and pulley 25 on a shaft or stud 32 which is carried by a bracket 33 suitably secured to the frame 1.

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The axis of the idler pulley 30 is disposed at a slight angle to the axis of the drum 23 and pulley 25 for a purpose that will be apparent hereinafter. A pair of similar guide sleeves 35 are carried by arms 36 which are secured to and extend out from the frame 1. One guide sleeve 35 is mounted above the drum 23 near the upper end of the frame 1 and the other guide sleeve 35 is mounted below the idler pulley 30 near the lower end of the frame 1. Current is supplied to the reversible motor 15 from any suitable source through an extension cord 40. A switch 41 is provided to control the operation of the motor.

In use the cable C extends down through the upper guide sleeve 35 and then around the drum 23 a plurality of turns. From the drum 23 the cable C extends down and around the idler pulley 30 and then up and around the pulley 25. From the pulley 25 the cable C extends down through the lower guide sleeve 35. When the motor 15 is running the drum 23 and the pulley 25 will be rotated in unison through the worm 13, worm gear 12 and shaft 10. When running in one direction the cable C is wound onto the drum 23 at the end thereof adjacent the frame 1 and is withdrawn from the drum 23 at the other end thereof by the pulley 25. Since the diameter of the drum 23 and the diameter of the groove 26 in the pulley 25 in which the cable C runs are the same, the cable is withdrawn from drum 23 at the same linear speed that it is wound onto the drum and is maintained taut upon the drum 23 and pulley 25 at all times. The pull upon the cable after it leaves the drum 23 necessary to maintain it taut is very slight, being at the most two or three pounds. When the motor 15 is running in the opposite direction the cable C is fed by the pulley 25 onto the end of the drum 23 adjacent the pulley 25 and is withdrawn from the other end thereof. From this it will be seen that when the drum 23 and pulley 25 are driven in one direction the unit B will climb up the cable C, and when the drum 23 and pulley 25 are driven in the opposite direction the unit B will climb down the cable C. The construction of the worm 13 and worm gear 12 with which the worm meshes is such that they will lock the shaft 10 against rotation when the motor 15 is not running.

To insure that there is no slippage between the pulley 25 and the cable C at any time, I provide an idler pressure wheel 42 which is spring-pressed into engagement with the cable C at approximately the point the cable C leaves the pulley 25. The wheel 42 is rotatably mounted upon a shaft 43 which is carried by a bifurcated arm 44 which is pivotally secured to a boss or stud 45 extending out from the frame 1. A spring 46, having one end thereof secured to the arm 44 by an eye-bolt 47 and the other end thereof secured to a stud 48 carried by the frame 1, resiliently holds the wheel 42 against the cable C, pressing it tight into the groove 26 during operation. When it is desired to apply the cable C to the unit or to remove it from the unit, the arm 44 is manually swung about its pivot into engagement with a stop 49 carried by the boss 45. The spring 46 will then hold the arm 44 against the stop 49.

In order to facilitate the application of the cable C to the unit B and its removal therefrom, I make each sleeve 35 in two half sections 50 and 51, with a vertical bore 52 therethrough which is of substantially the same diameter as

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the cable C. The lower end 53 of the sleeve which is of lesser diameter than the upper end 54 thereof is inserted in an aperture 55 in an arm 36 and is held therein by a set screw 56. The end of the arm 36 is provided with a slot 57, the width of which is slightly greater than the diameter of the cable C, but considerably less than the diameter of the aperture 55. To remove the cable C from the unit B the set screws 56 are first loosened and then the sleeves are slid up the cable C out of the apertures 55 after which the halves 50 and 51 are separated and removed from the cable. The cable is then removed from the apertures 55 through the slots 57. The cable can then be removed from the drum 23 and pulleys 25 and 30. In applying the cable C to the unit B it is first wound around the drum 23 and pulleys 25 and 30 and then inserted through the slots 57 into the apertures 55. The sleeves 35 are then placed around the cable above the arms 36 and then moved down into the apertures 55 and fastened by the set screws 56.

If desired the operating mechanism may be enclosed by a removable cover which will prevent workmen from getting their hands or clothing caught therein. Such a cover would also prevent damage to the mechanism by falling articles.

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. A hoisting mechanism adapted to move up and down a suspended cable, said hoisting mechanism comprising a frame, a shaft rotatably supported by two spaced bearings carried by said frame with one end of said shaft extending out from one of said bearings, a worm gear secured to said shaft between said bearings, a worm meshing with said worm gear, means for rotating said worm, a drum about which said cable is wound a plurality of turns, said drum being secured to the extending end of said shaft, a pulley about which said cable passes after leaving said drum, said pulley being secured to said shaft at one side of said drum, an idler pulley operative to guide said cable from said drum and onto said first mentioned pulley, and means operative to resiliently press said cable into engagement with said first mentioned pulley.

2. A hoisting mechanism adapted to move up and down a suspended cable, said hoisting mechanism comprising a frame, a shaft rotatably mounted on said frame with the ends of said shaft disposed on opposite sides of said frame, shaft rotating means carried by said frame and operatively connected to said shaft on one side of said frame, a drum about which said suspended cable is adapted to be wound a plurality of turns, said drum being secured to said shaft on the other side of said frame, a tension pulley operative to withdraw said cable from one end of said drum in unison with the winding of said cable onto said drum at the opposite end thereof to thereby maintain said cable taut upon said drum, said tension pulley being mounted upon said shaft adjacent said drum, and an idler pulley rotatably mounted on said frame in spaced relation to said drum and said tension pulley, said idler pulley being independent of said drum and

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said tension pulley and operative to guide said cable onto said tension pulley after said cable leaves said drum.

3. A hoisting mechanism as defined in claim 2 in which pressure means is provided to resiliently press said cable into engagement with said tension pulley.

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