Dec. 30, 1947. H. S. GEER 2,433,692

SCAFFOLDING DEVICE

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Fig. 1.

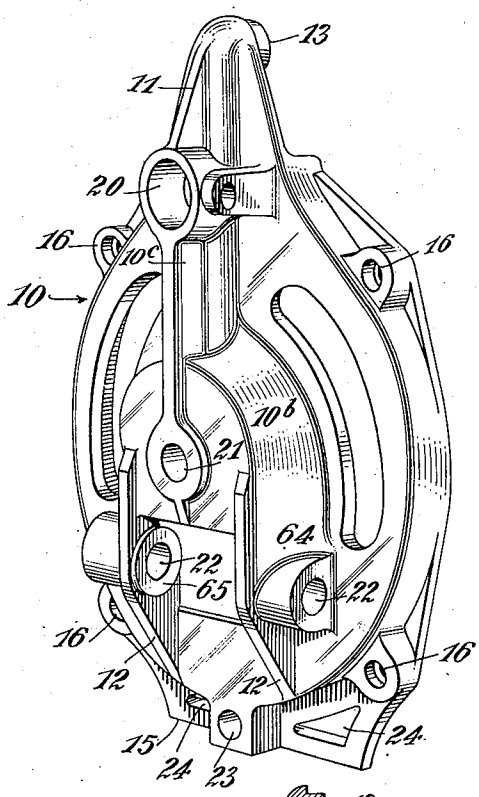


Fig. 2.

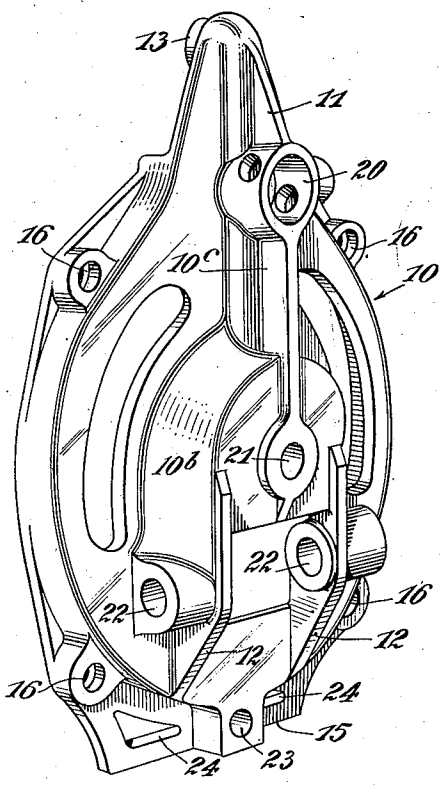
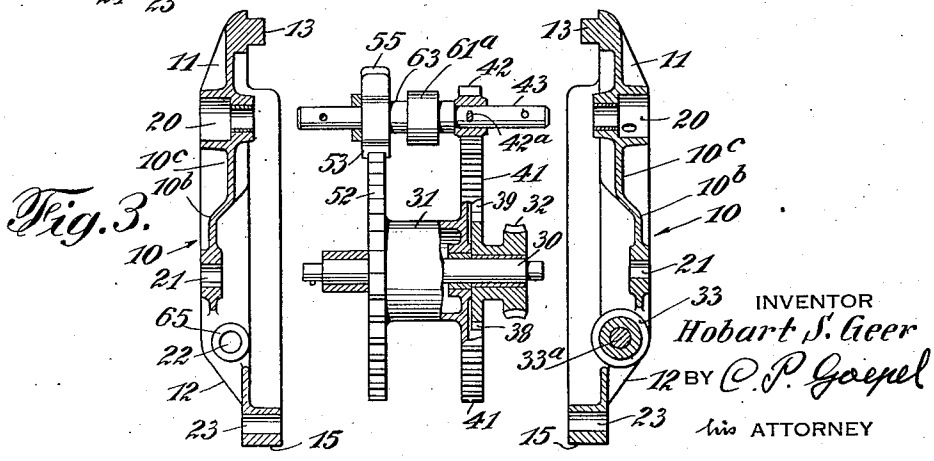


Fig. 3.



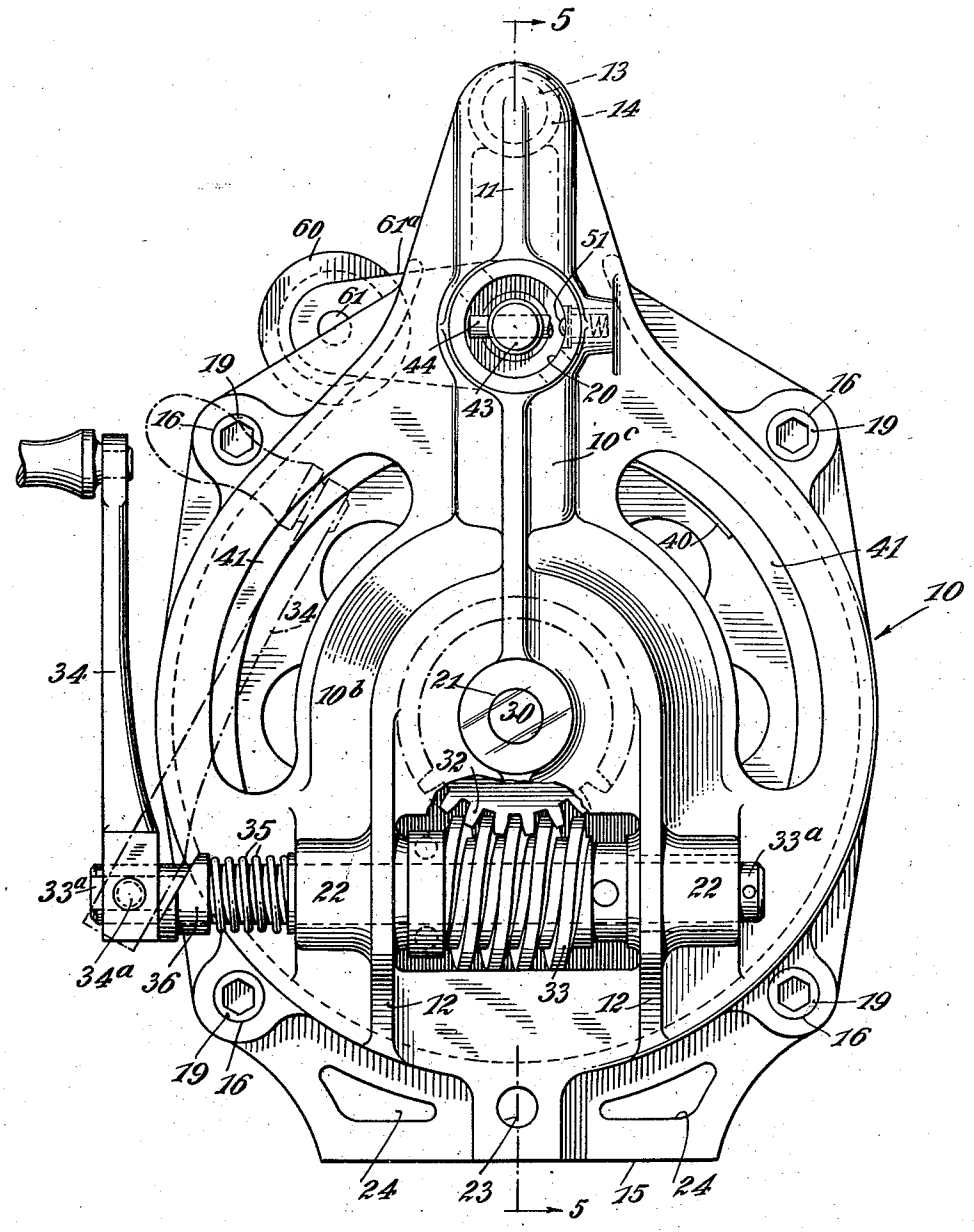
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SCAFFOLDING DEVICE

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Fig. 4.



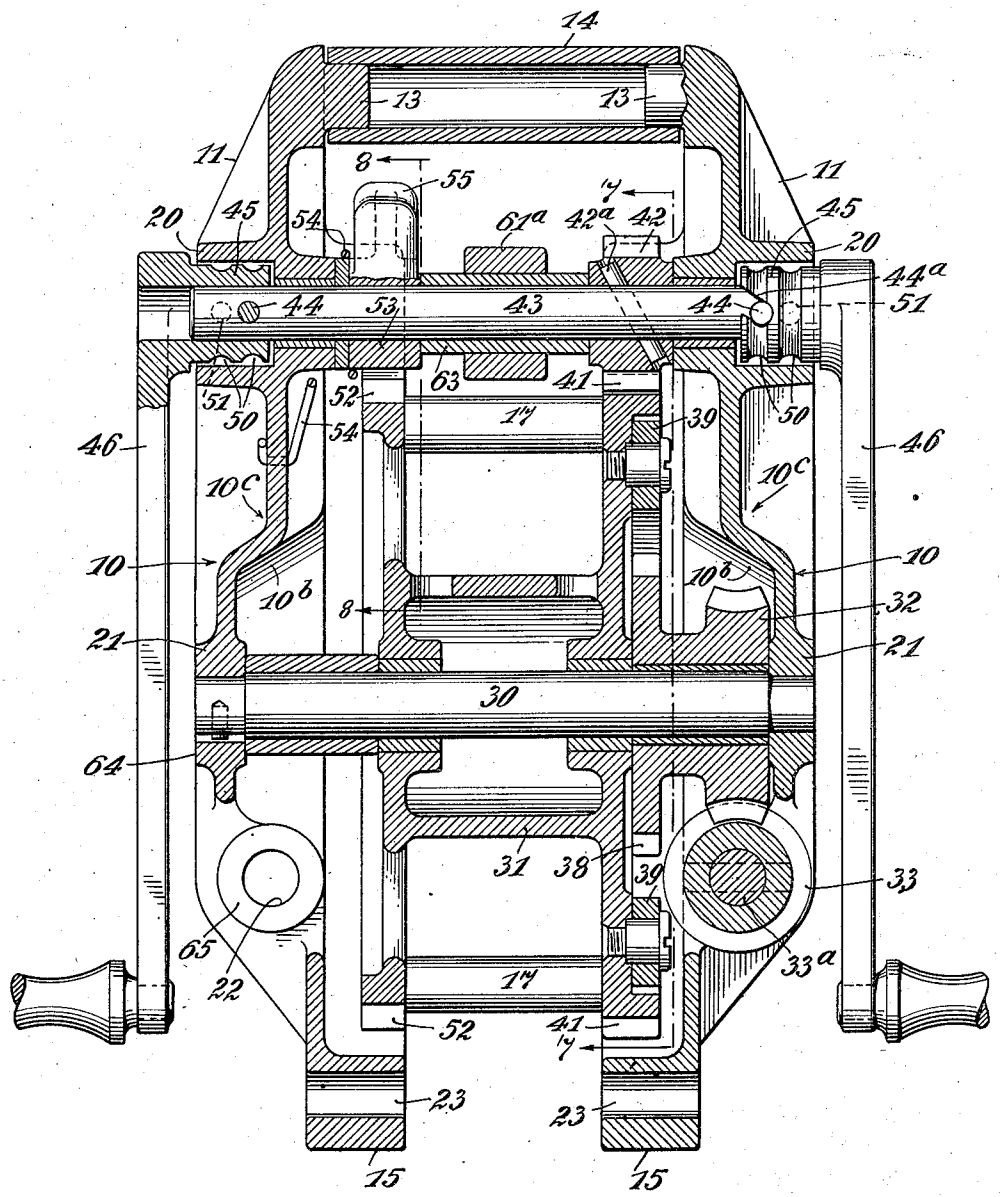
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Fig. 5.



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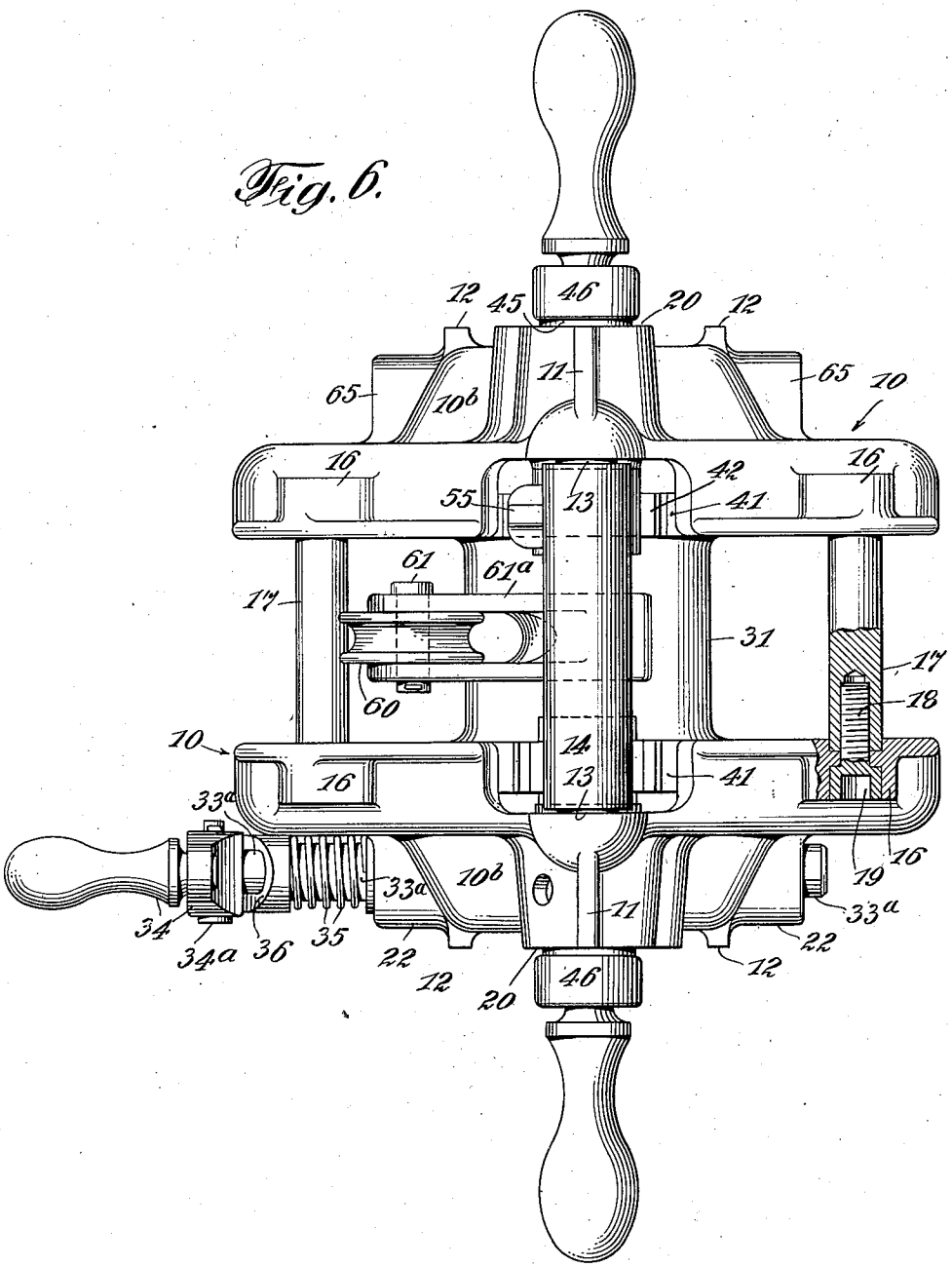
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Fig. 6.



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Fig. 7.

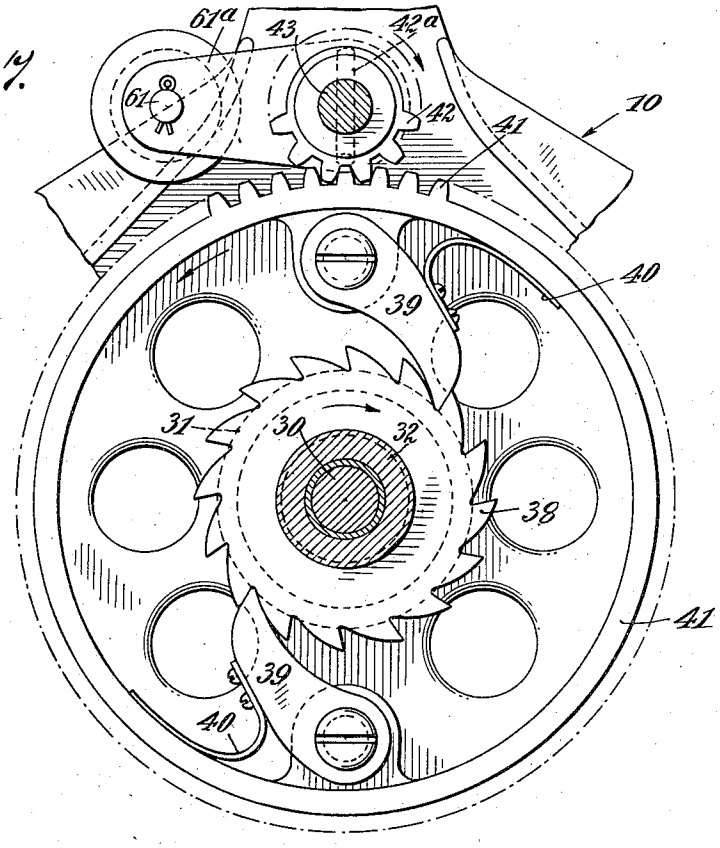
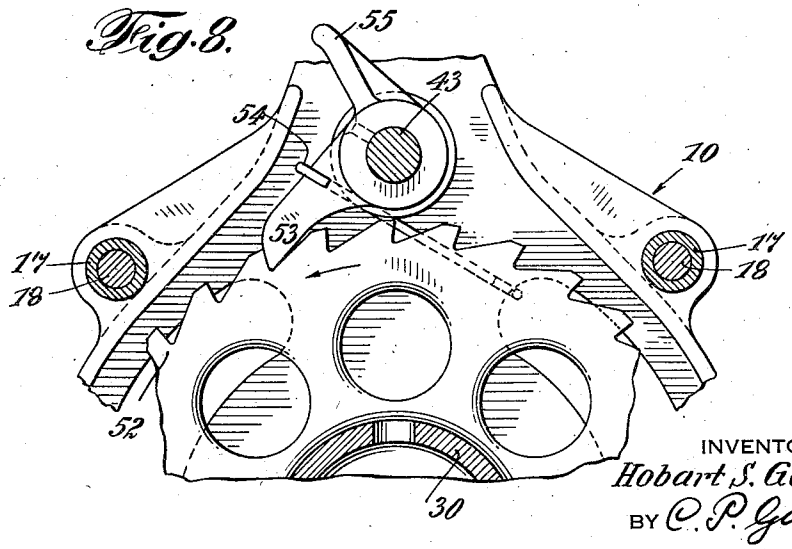


Fig. 8.



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Patented Dec. 30, 1947 2,433,692

UNITED STATES PATENT OFFICE

2,433,692

SCAFFOLDING DEVICE

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Application March 2, 1945, Serial No. 580,620

2 Claims. (Cl. 254—170)

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This invention relates to scaffolding devices, generally used in pairs to suspend a workmen's platform.

The object of the invention is to provide a novel structure which can be readily assembled, is adaptable to be moved along the sides of ships or other vertical structures by a skid action, is easily moved from place to place, and finally, is readily adaptable to a left hand or right hand operative lowering device.

Heretofore, in the use of scaffolding devices a strap frame of fixed dimensions was used into which the various operative parts had to be inserted. Considerable time was required to adjust the parts to the frame or the frame to the parts, and often certain parts were placed under needless strain and stress weakening the general structure, whereas safety was a desideratum. In devices according to the present invention, the operative parts readily fit into the enclosing shell like frames, without straining any of the parts.

The invention consists of a pair of mirror reverse side plates providing interior formations for the entrance of the operative parts of the scaffolding device, having exterior contours adapted to skid the device along a vertical wall, and having means to readily support it and to enable it to be carried from place to place.

The invention will be further described, shown in the drawings and finally pointed out in the claims.

In the accompanying drawings,

Fig. 1 is a perspective view of one plate;

Fig. 2 is a perspective view of the other plate, both plates being identical with each other;

Fig. 3 is an exploded view showing the general assembly method;

Fig. 4 is a right hand end view of Fig. 5;

Fig. 5 is a vertical section taken on line 5—5 of Fig. 4;

Fig. 6 is a top view of Fig. 4, including the handles;

Fig. 7 is a detail section taken on line 7—7 of Fig. 5, and

Fig. 8 is a detail section taken on line 8—8 of Fig. 5.

Similar characters of reference indicate corresponding parts throughout the various views.

Referring to the drawings, and more particularly to Figs. 1 and 2, the side plates 10 are there shown.

Each side plate 10 is provided with an outstanding inclined rib 11 at the upper part thereof, and with two inclined ribs 12 at the lower part

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thereof. These ribs are so shaped in order to act as skids to permit the movement of the device along a vertical surface, as the side or hull of a ship. The upper inner ends of the frames are provided with projections 13 for entering the ends of a supporting tube 14 (Fig. 5). The lower ends 15 of the frames are in a plane in order to form a supporting base, to enable the combined structure to stand without tipping. Along the margin of the frames there are provided openings 16 for the passage of tie rods 17 (Fig. 6), held by screwthreaded members 18 having hexagonal sockets 19.

Each frame 10 has an outward bulging portion formed like an inverted U (10*b*), into which is merged a vertical portion 10*c* forming together an inverted Y, which acts as a strengthening member. The upper end of the inverted Y provides a bearing 20 and the lower ends provide bearings 22; a bearing opening 21 being intermediate of the upper bearing 20, and lower bearing 22.

Another bearing 23 is provided in each of the plates 10 at the lower ends thereof. Spaces 24 are provided in the plates 10 to lighten the same.

In Figure 3 there are shown the two enclosing frames or shells 10, and the operative mechanism therebetween. It is only necessary to move the shells or frames towards each other, when the ends of the shafts 43 and 30 of the operative mechanism engage the bearings 20 and 21 respectively. The worm shaft 33*a* having been first seated in the bearings 22. The tube 14 is likewise engaged by the projections 13. Thereafter, the tie rods 17 are applied to the openings 16 and locked in place. The assembly is of extreme simplicity without straining any of the parts.

Referring now to Fig. 5, in which the pair of plates 10 shown in Figs. 1, 2 and 3 are assembled, a centrally disposed drum shaft 30 has its end supported in the bearing 21. A drum 31 is mounted on the shaft 30. Upon one end of the shaft 30 is mounted a worm gear 32. In Fig. 5, it is applied at the right hand, but it may be applied to the left hand. A worm gear 33 is supported by the shaft 33*a* moving in the bearings 22. The bulge 10*b* of the frame 10 is provided to form a space for the worm gear 32 and worm 33. The end of the shaft 32*a* for the worm 33 is rotated by a handle 34 when the handle 34 is in full line position. A spring 35 (Fig. 4) holds an inclined cam 36 outwardly, and the inclined cam 36 permits the handle 34 to be moved to an inclined out of operation position within the space between

the frames 10 as shown by the dotted line position in Fig. 4, the handle 34 being pivoted to the end of the shaft 33a, at 34a. The worm 33 is rotated when the drum 31 is desired to be rotated in order to release the cable thereon (not shown), thereby lowering the device.

Preferably, as part of the worm gear 32, a ratchet 38 (Fig. 7) is provided, which is engaged by pawls 39 supported by the drum 31 and pressed by springs 40. The rotation of the drum in the direction of the arrow enables the pawls 39 to pass freely over the teeth of the ratchet 38.

At this side of the drum, the drum has a gear 41, engaged by a pinion 42 on the shaft 43 (Fig. 7). A pin 42a secures the pinion 42 to the shaft 43. Each end of the shaft 43 is provided with a pin 44 (Fig. 5) which is engaged by a hub 45 of the handle 46. The rotation of the handle 46 rotates the shaft 43, and the pinion 42 rotates the gear 41 of the drum 31, and thus the drum 31 (Fig. 7) and winds the cable, thus raising the device, the pawls 39 riding freely on the ratchet 38. When it is desired to unwind the cable that is lower the device, the handle 55 is pressed back, and the pawl 53 disengaged from the teeth of the ratchet 52. The worm 33 is then rotated, the worm gear 32 rotated thereby and the drum 30 rotate in the opposite direction to the winding up direction.

The handles 46, one on each side of the device, are usually operated by a man swinging both handles, though one handle can be used, the handles being preferably disposed in directions 180° apart (not shown). The hub 45 of each handle 46 is provided with circumferential grooves 50 into one of which a spring pressed button 51 fits (Figs. 4 and 5), to hold the handle from being unintentionally disengaged, after the slot 44a has been moved out from its pin 44.

The other side of drum 31 has a ratchet toothed perimeter 52 (Fig. 8), upon which a pawl 53, pivoted to the shaft 43, rides, when the drum is winding the cable. The pawl 53 is held down by a spring 54 looping the pawl and having its end secured to the frame (Figs. 8 and 5). The pawl has a handle 55 extending above and to the outside of the frames 10, for ready access. When the worm and worm gear is being operated, the handle 55 is pressed and the pawl 53 disengaged from the ratchet 52, permitting its rotation in the drum unwinding direction.

A cable sheave wheel 60 (Figs. 4, 5 and 6) is supported on a shaft 61, in turn supported by a bracket 61a, pivoted to the shaft 43. In the embodiment an intermediate centering sleeve 63 is disposed between the shaft and bracket (Fig. 5).

A bolt or other supporting means for a platform (not shown) may be inserted into the bearings 23 of the lower part of the frames.

In Fig. 5 there is shown at the right side, a worm 33 and gear 32. This worm 32 may be readily detached and placed at the left hand in the portion 64 of the bulging portion 10b of the left hand frame (Figs. 5 and 1). The worm shaft 33a is placed into the bearings 22 of the portion 65 of the frame 10. Depending upon the locality where the device is used, either a left hand or a right hand worm is employed. It is preferable to place it on the side of the structure away from the wall against which the platform is intended to be placed.

It will be noted that the shaft 30, drum 31, worm gear 32, and shaft 43 with the pawl 53, and pinion 42, all form an operative unit, having laterally extending shaft ends. With this operative unit assembled it is only necessary to place it between the two mirror reverse frames or shells 10, apply the tie rods, handle 14, handles 46, and the device is ready to be used with a suitable platform, the worm 33 being placed in one frame. It can be easily carried by means of the handle 14, or stood upright on its flat base 15. The ribs 11 and 12 enable the device to skid along a vertical wall, which is important, since the devices heretofore used very often are subjected to strains and stresses by shocks resulting from being caught by an obstruction, and then suddenly released therefrom.

The device is compact. All frames or shells nest on each other, when being shipped. There are no exposed bolts. It is truly universal. It is light in weight. It is easily assembled and taken apart, in consequence of which replacement of parts is facilitated.

For winding the cable on the drum, the handles 46 are actuated and the pinion 42 is rotated in the direction of the arrow shown at its periphery in Fig. 7, which pinion rotates the drum gear 41 in the direction of the arrow shown near its periphery. When it is desired to unwind the cable, the member 55 is moved to release the pawl 53 from the drum ratchet 52. There is then a pull of the cable directly on the drum, but the presence of the gear 32 and worm 33, and pawl 39 prevents a free unwinding; thus acting as a safety device in the manner well known. When the worm gear 32 is rotated in the direction of the arrow shown in Fig. 7, drawn upon this gear, the pawl 39 will follow, and the cable is unwound to that extent. When it is desired to wind again, the pawl 53 is again engaged into the ratchet 52 and takes up the load.

I have described various embodiments of my invention, but obviously changes may be made in the details disclosed without departing from the spirit of the invention as set out in the following claims.

I claim:

1. In a scaffolding device having an operating raising and lowering mechanism including a cable winding drum, a supporting shaft for the same, a gear wheel on said shaft at one side of the drum, a worm gear on the shaft, said shaft extending axially beyond the drum and worm gear, a driving shaft axially parallel with the first shaft, and a pinion on said driving shaft, said driving shaft having its ends extending axially into substantially parallel planes passing through the ends of the supporting shaft, said planes being vertical to the supporting shaft, the combination with said mechanism of a pair of identical enclosing frames each including a shell having a straight bottom base, an inverted Y-shaped outwardly extending bulge, and having bearing openings, one for the drum shaft end, one for the pinion shaft end, and two axially at right angles to said shaft openings adapted to receive a shaft for a worm engaging said worm gear, said bulge having walls inclined to the opposite ends of the shells forming skid portions, said shells having additional openings for tie rods, whereby, when the frames are placed one at each side of said mechanism to enclose the same and held together by tie rods, the bulge of one frame allows for the gearwheel and supports the worm, and the bulge of the other frame allows for the gearwheel and supports the worm when the gearwheel is disposed on the other side of the mechanism, the skid portions protecting the bulge on the sliding of the device on the side of the frame,

said bulge strengthening the structure of the shell.

2. The structure of claim 1, a handle for said worm shaft for lowering the device, having a bevelled cam, permitting the movement of the handle between said frames into inoperative position, and a detachable handle for said pinion shaft for raising the device.

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