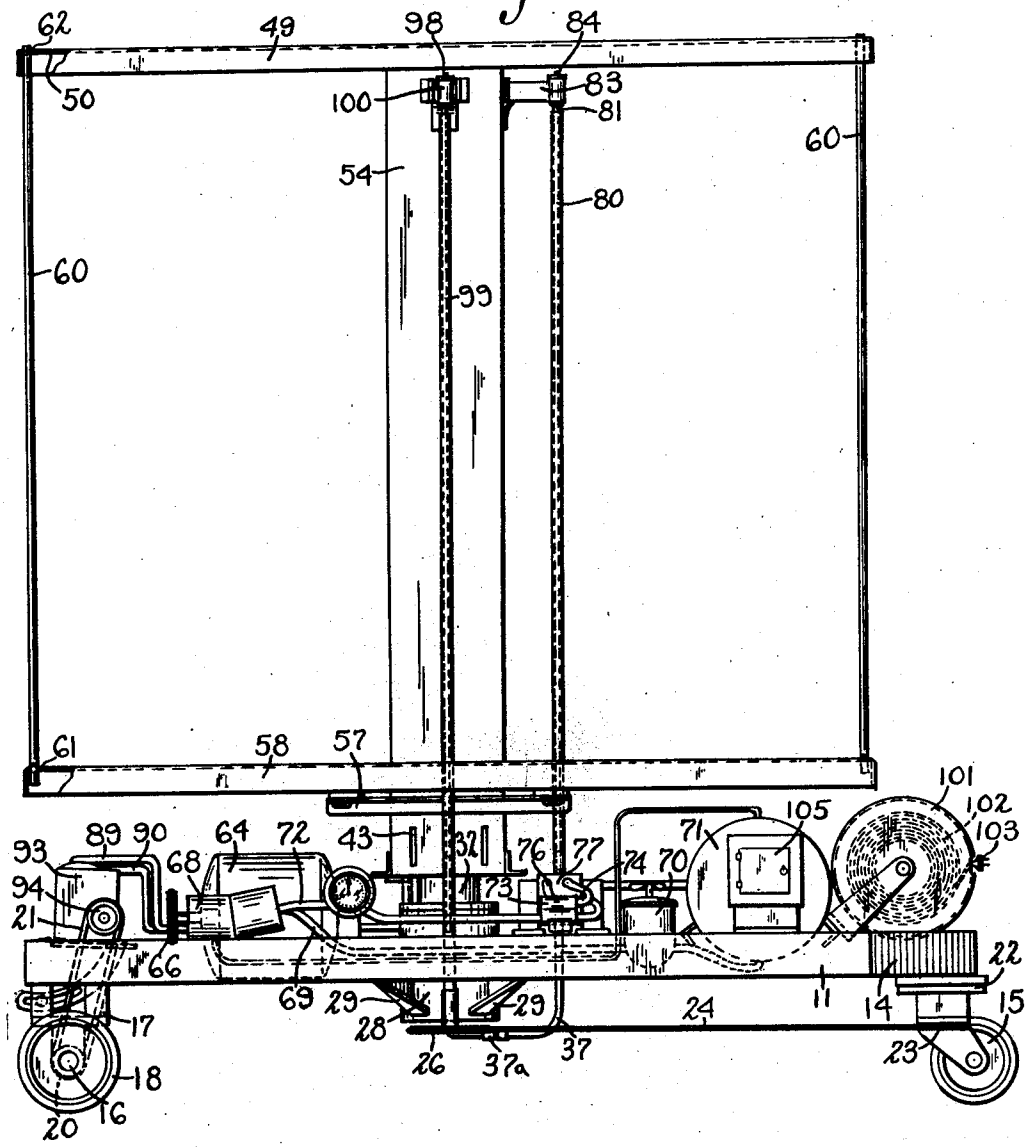
April 14, 1953 E. J. GETTY ET AL 2,635,014

PORTABLE SCAFFOLDING

Filed Sept. 14, 1949 5 Sheets-Sheet 1

Fig. 1.



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PORTABLE SCAFFOLDING

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Fig. 2.

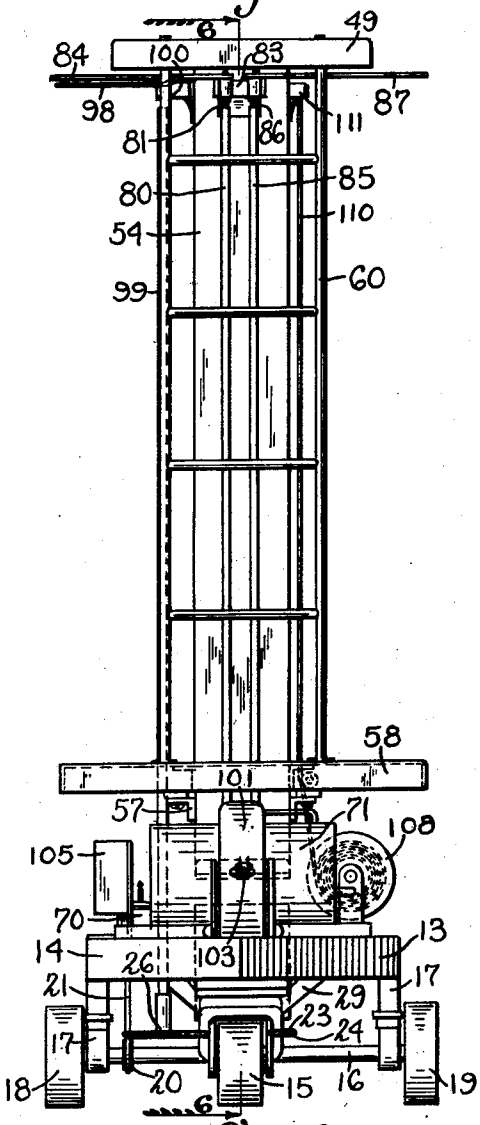


Fig. 3.

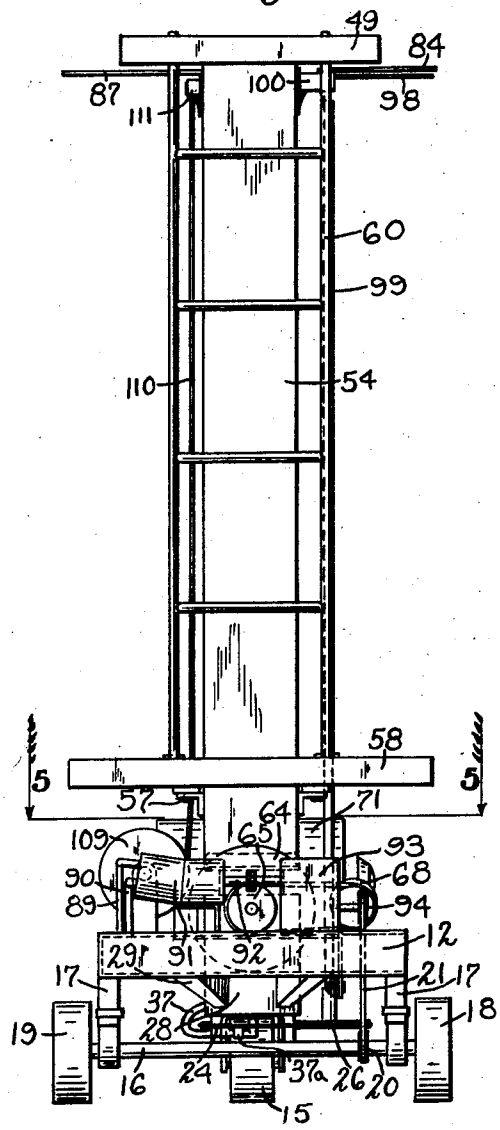
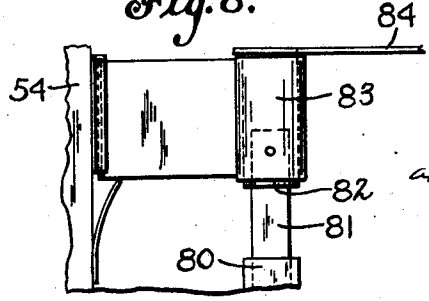


Fig. 8.



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PORTABLE SCAFFOLDING

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Fig. 4.

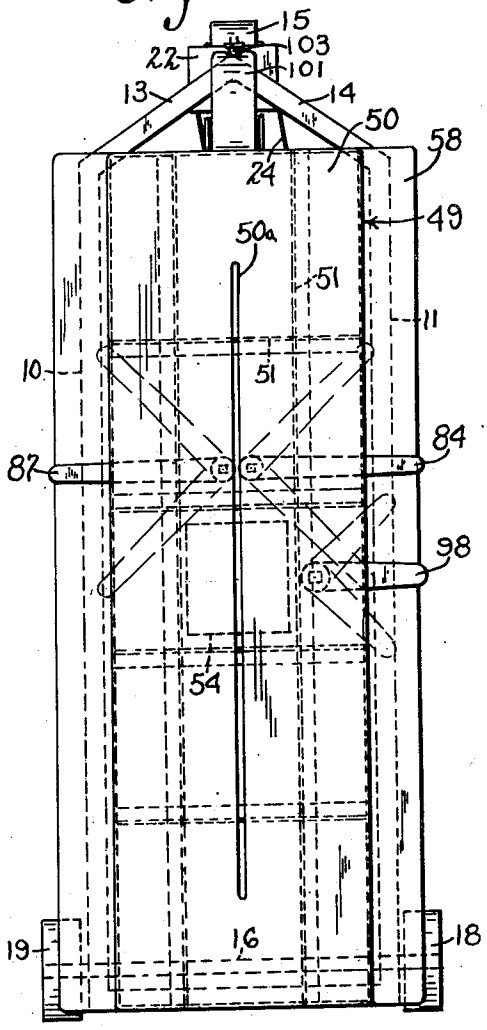


Fig. 5.

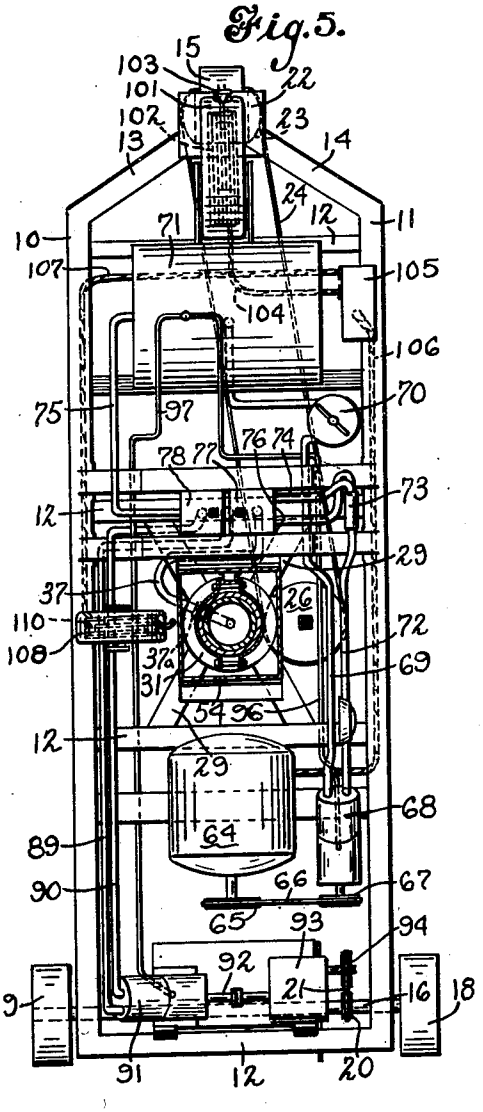
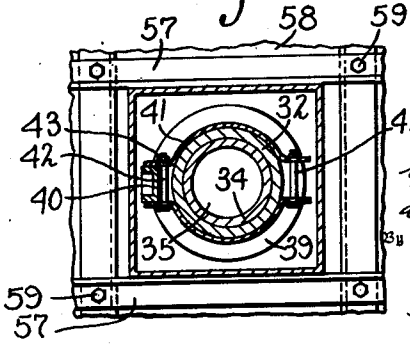


Fig. 7.



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PORTABLE SCAFFOLDING

Filed Sept. 14, 1949 5 Sheets-Sheet 4

Fig. 6.

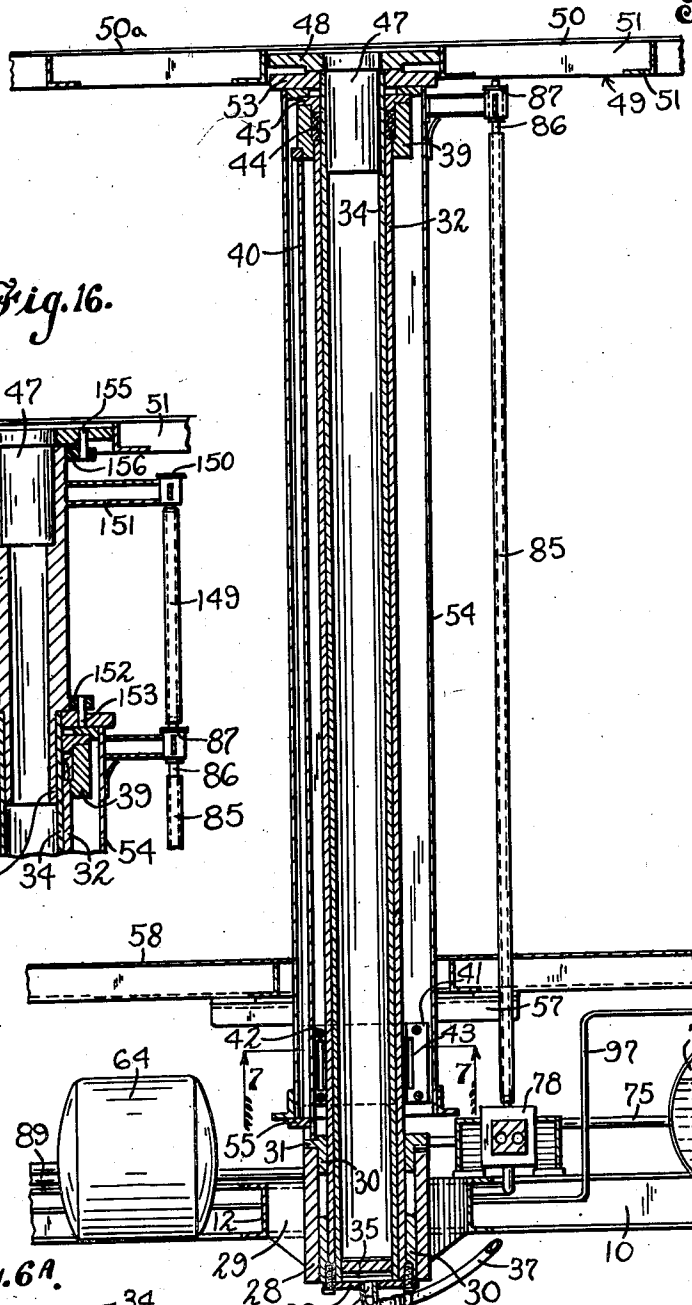
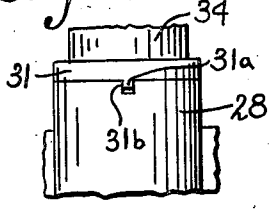


Fig. 16.

Fig. 6A.



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PORTABLE SCAFFOLDING

Filed Sept. 14, 1949 5 Sheets-Sheet 5

Fig. 9.

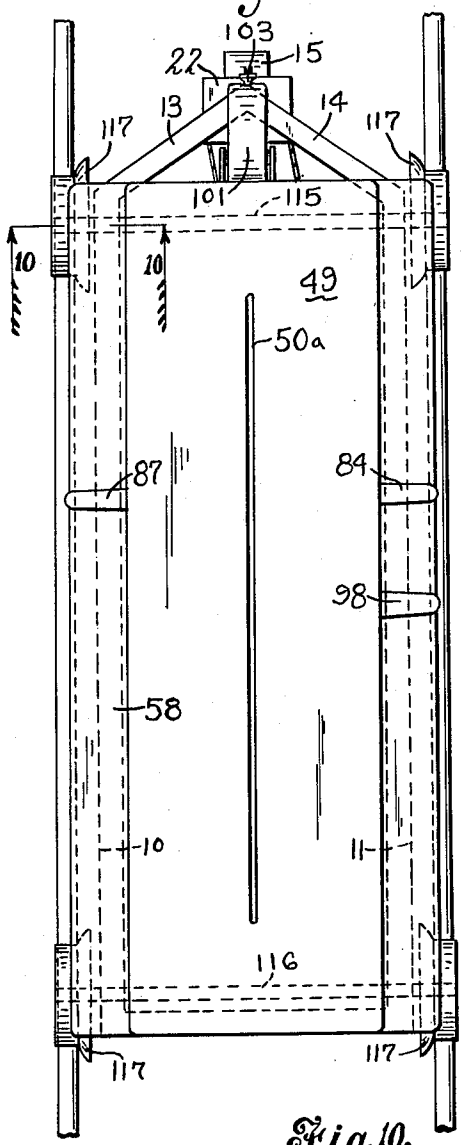


Fig. 10.

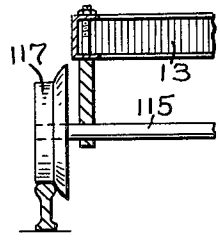


Fig. 11.

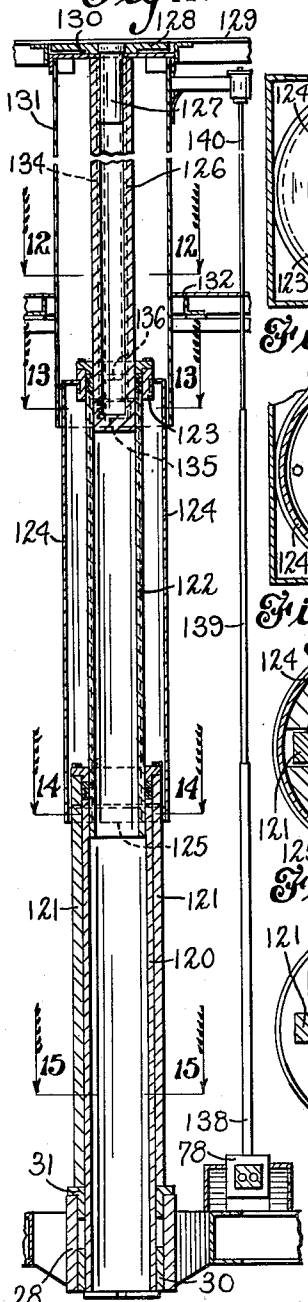


Fig. 12.

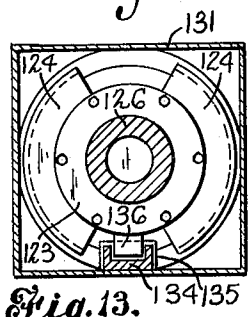


Fig. 13.

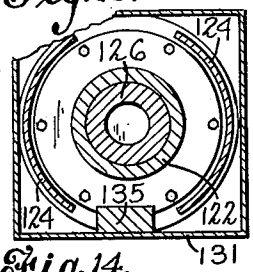


Fig. 14.

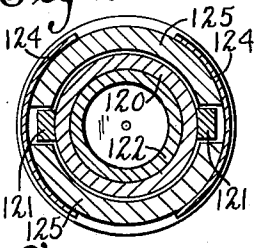
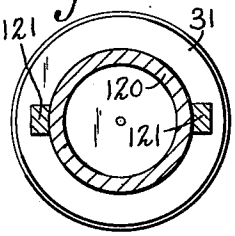


Fig. 15.



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UNITED STATES PATENT OFFICE

2,635,014

PORTABLE SCAFFOLDING

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Application September 14, 1949, Serial No. 115,628

3 Claims. (Cl. 304—9)

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This invention relates to a portable scaffolding and, more particularly, to a structure provided with a movable base upon which base is supported one or more platforms upon which workmen may stand or sit, the platforms being elevatable to the proper height.

In many kinds of work, and particularly in connection with painting or decorating work, it is necessary to provide scaffolding upon which the workmen may stand. Such scaffolding is usually of a temporary character and not only requires considerable time to construct and dismantle, but also is usually stationary and must be dismantled to be moved from one place or wall to another and usually cannot be varied as to height.

It is contemplated by the present invention to provide a portable scaffolding mounted upon a movable truck or base structure so that it may readily be moved from one place to another, and to provide power means for moving the device. Upon the truck are mounted a pair of spaced platforms, the upper platform being positioned a sufficient height above the lower so that workmen can be accommodated upon the latter in either a sitting or standing position so that workmen may use both upper and lower platforms or stages.

Both platforms are arranged so that they may be elevated or lowered, and provision is made for control of the raising and lowering mechanism from the upper patform so that workmen will not be obliged to descend in order to change the elevation of the platform. Similarly, a workman upon the upper platform may control the movement of the device from place to place and thus can move the scaffolding from one place to another, as well as adjusting the staging vertically, without having to descend from the upper platform.

One object of the invention is to provide an improved portable scaffolding or staging for decorators and other workmen.

A further object of the invention is to provide a device of the character described which will be automotive in the sense that it can be propelled from place to place by workmen on the platforms.

A still further object of the invention is to provide a movable staging or scaffolding with two spaced platforms, one being mounted above the other, and to provide means for raising and lowering the platforms so as to support the workmen thereon at the proper height.

Still another object of the invention is to provide a device of the character described wherein the raising and lowering mechanism of the platforms, as well as the propelling mechanism for the supporting truck of the device, will be controllable from a point adjacent the upper platform.

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Still another object of the invention is to provide a device of the character described which will be of proper dimensions so that it may pass through a door of ordinary size in order that the device may be used for interior as well as exterior work.

To these and other ends the invention consists in the novel features and combinations of parts to be hereinafter described and claimed.

In the accompanying drawings:

Fig. 1 is a side elevational view of a portable scaffolding embodying our invention;

Fig. 2 is a front elevational view thereof;

Fig. 3 is a rear elevational view of the device;

Fig. 4 is a top plan view;

Fig. 5 is a horizontal sectional view taken on line 5—5 of Fig. 3;

Fig. 6 is a partial vertical section on line 6—6 of Fig. 2;

Fig. 6A is a detail elevational view of the means for supporting the cylinder;

Fig. 7 is a sectional view on line 7—7 of Fig. 6;

Fig. 8 is a fragmentary detail view of a part of the control mechanism;

Fig. 9 is a top plan view of a slightly modified form of our device;

Fig. 10 is a sectional view on line 10—10 of Fig. 9;

Fig. 11 is a sectional view similar to Fig. 6 showing a modified form of our invention;

Figs. 12, 13, 14 and 15 are sectional views taken respectively on lines 12—12, 13—13, 14—14, and 15—15 of Fig. 11;

Fig. 16 is a sectional view through the upper portion of the cylinder and ram of a modified form of our invention.

To illustrate a preferred embodiment of our invention, we have shown a supporting truck comprising a supporting frame consisting of longitudinal members 10 and 11 and transverse members 12 together with forwardly converging members 13 and 14 at the front end of the frame where a steering wheel 15 is carried, as will be described hereinafter. At the rear end of the frame an axle 16 is rotatably supported in brackets 17, and ground wheels or floor wheels 18 and 19 are carried by the axle. The wheel 18 is secured to the axle to act as a drive wheel, while the wheel 19 may rotate freely upon the axle. The axle is designed to be driven by a pulley 20 from a belt 21 to propel the device from place to

place, as will be more fully described hereinafter.

A steering wheel 15 is mounted upon the frame to rotate upon a vertical axis, and, as shown more especially in Fig. 5, a plate 22 is secured to the wheel structure, which plate is provided with arcuate side edges 23 about which are trained the ends of a cable 24, this cable being secured to the plate 22 and at its bight portion being trained about a steering pulley 26.

Referring particularly to Figs. 1, 5 and 6, a hollow sleeve 28 is secured to the truck frame substantially centrally thereof, this sleeve being supported by members 29. The lower end of a cylinder 32 is removably received within this sleeve member. To the lower end of the cylinder a pair of rings 30 are secured, the upper of these rings having a projecting peripheral flange 31 which extends over and rests upon the upper edge of the sleeve 28 so that the cylinder is supported by the upper ring. The lower end of the cylinder is closed by a plate 33. Within the cylinder a hollow ram 34 is slidably mounted. The cylinder is prevented from rotating within the sleeve 28 by a lug or pin 31^a (Fig. 6^A) projecting downwardly from the flange 31 to be received in a recess 31^b provided in the upper edge of the sleeve 28.

The lower end of the ram is closed by a plug 35 and pressure fluid may be admitted to the cylinder below the ram through a port 36 in the plate 33 and a tube 37 leading to the port 36 from a source of fluid pressure, as will be hereinafter explained.

At the upper end of the cylinder 32 is a collar 39 to which is secured a channel-shaped member 40 forming a guideway for a purpose to be hereinafter explained. The lower end of the member 40 is secured to the upper sleeve 30 which is rigid with the cylinder 32. A clamp device 41 (Fig. 7) embraces the cylinder 32 and is clamped therearound by the bolts 42. The clamp members 41, as shown in Fig. 6, are provided with vertically elongated openings 43, one upon each side of the cylinder, so that properly shaped beams or rods may be passed therethrough to raise the cylinder from the supporting truck when desired. Packing material 44 may be provided about the ram 34 within the collar 39, the packing being held in place by the gland 45. The cylinder may be raised by the angle irons 57, hereinafter described.

Within the upper end of the hollow ram 34 is slidably fitted a plug 47 to which is secured a supporting plate 48 which in turn carries the upper platform or stage 49. This stage can be made of any desired size and of any suitable construction. As shown, it comprises a platform 50 supported upon angle irons 51. It will be apparent that with this construction the plug 47, together with the upper stage 49, which is secured thereto, may be removed freely and easily from the hollow ram 34 when it is desired to disassemble the device, as the plug 47 merely rests slidably within the ram.

Secured to the ram 34 is a rectangular plate 53, and secured to and depending from this plate is an elongated hollow shield 54, of rectangular shape in cross section, which covers the cylinder 32 and which is, of course, movable with the hollow ram. Secured to the lower end of the shield 54, as shown more especially in Fig. 6, is a key 55 which fits within the channel-shaped guide member 40 and slides therewithin during raising and lowering movements of the ram. As this guide member 40 is secured to the cylinder 32, this engagement of the key within the guideway will prevent turning movements of the ram within the cylinder. As the plate 53 is of rectangular shape and fits between two of the angle irons 51, this will prevent the upper stage 49 from turning upon the hollow ram 34.

With the above construction, it will be seen that when fluid pressure is introduced into the cylinder 32 below the ram 34 through the opening 36, the ram will be raised and will raise the upper stage 49 to the desired extent and, at the same time, this stage will be prevented from rotating with respect to the frame of the truck. The guide channel 40 is closed at the top and the key 55 will, when the ram has been raised to its upper limit, abut the closed end of the channel which will act as a stop to limit further raising movement. It is understood that the shield 54 being secured to the plate 53 will be raised with the ram and this will also serve to raise the lower stage or platform, as will be hereinafter explained. The shield also serves to protect the ram and prevent dust or dirt from collecting on it.

Secured to the shield 54 adjacent the lower end thereof are a pair of angle irons 57, and upon these angle irons is supported a lower stage or platform 58, this platform being secured to the angle irons by bolts 59 (Fig. 7) so that by the removal of the bolts the lower platform may be raised upwardly and removed from the shield after the upper platform has been removed as previously described. Thus, the entire machine may be readily disassembled into four parts consisting of the upper platform which with the attached plug 47 may be lifted freely from the ram 34, the lower platform which may be lifted from the shield after the bolts 59 are removed and the upper platform taken off, the staff comprising the shield 54, the ram and the cylinder, and, lastly, the wheeled truck. It is understood that the cylinder may be lifted freely from the sleeve 28 after the connections to the tube 37 have been removed.

The lower stage, as shown in the drawings, is slightly wider than the upper stage but of substantially the same length and both are of substantially the same length as the body of the truck. The triangular shape of the truck body brings the center thereof to a position slightly forward of the staff so that if necessary to brace the truck at any time, outriggers may be secured thereto at a point midway between the wheels, which will be forwardly of the staff.

A ladder 60 may be provided at each end of the lower platform, the ladder reaching to the upper platform so as to provide means by which the workmen may reach the upper platform. The lower ends of the side members of the ladder may rest in sockets 61 in the lower platform, as shown in Fig. 1, and project through openings 62 in the upper platform.

The means by which the movements of the truck and the raising and lowering movements of the ram may be effected and controlled will now be described.

Mounted upon the truck adjacent its rear end is an electric motor 64, the shaft of which carries a pulley 65 which, through a belt 66, drives a pulley 67 secured to the shaft of an oil pump 68. The oil pump is provided with an intake line 69 which leads through a filter 70 to an oil supply tank 71 mounted on the forward portion of the truck frame.

The delivery line 72 of the pump 68 leads to a

relief valve 73 so constructed that if the pressure is too high the discharge from the pump 68 will be connected with the pipe 74 which is in turn connected with the relief line 75 which leads back to the supply tank 71. If, however, the relief valve 73 is closed, the delivery from the pump 68 leads through the pipe 72 and the relief valve 73 into the pipe 76, which delivers oil into two valve mechanisms 77 and 78.

The valve 77 is so arranged that it may connect the pipe 76 with the duct 37, previously described, which leads into the lower end of the cylinder 32 (Fig. 6), or when turned to another position this valve closes the line 76 and connects the duct 37 to the return line 75 so as to drain the oil from the cylinder 32 and permit it to flow back into the tank 71, the ram and platforms carried thereby dropping by gravity to a lower position.

To the valve 77 is connected a square sleeve 80, and telescoped within this sleeve is a square stem 81 (Figs. 1 and 8), this stem being secured at its upper end to a thimble 82 rotatably mounted in a bracket 83 supported by the shield 54. One the upper end of the thimble is a control arm 84 which is shown in Fig. 4 in a neutral position in full lines, and in two other positions in dotted lines. It will be apparent that as the upper platform is raised or lowered the stem 81 may slide within the hollow square sleeve 80 so that an operator on either of the platforms 49 or 58 may reach the control arm and control the position of the valve 77. In the full-line position of the control arm, the valve is so disposed that the line 76 will be closed and the fluid delivered by the pump 68 will return to the tank 71 by way of the relief valve. When the arm 84 is in one of the dotted-line positions, the fluid pressure will be delivered to the cylinder 32 and the ram will be raised to the extent desired or to the extent permitted by the length of the ram, thus raising both of the platforms. When the control arm 84 is in the other dotted-line position, the lower end of the cylinder will be connected with the return line 75 to the tank 71 and will allow the oil to drain from the cylinder and the two platforms to drop gradually under gravity.

Similarly a hollow sleeve 85 is secured to the valve 78 (Fig. 6) and a square stem 86 slidably received in this sleeve connects the sleeve with the control arm 87 for operation thereby so that this valve may be placed either in a neutral position, as shown in full lines on Fig. 4, or in either of the two dotted-line positions shown in this figure.

The valve 78 is connected by two lines 89 and 90 with a fluid motor 91 which is similar to the pump 68, but which works in reverse. That is, fluid under pressure is delivered to the motor 91 and causes the rotor thereof to rotate. The rotation of this rotor drives the shaft 92 which, through changed speed gearing 93, drives the pulley 94 which in turn drives the belt 21 (Fig. 3, previously described) which in turn drives the axle 16 to propel the truck.

The neutral or full-line position of the control arm 87 shown in Fig. 4 places the valve 78 in position so that both of the lines 89 and 90 will be closed and, if the pump 68 is in operation, the oil will pass through the return line 75 to the tank 71. If, however, the arm 87 is moved to one of the dotted-line positions, oil will be delivered through the pipe 89 to the motor 91 which will drive the shaft 92 in a direction to propel the truck in a forward direction, the oil returning through the pipe 90, valve 78, and return line 75 to the tank. If, however, the control arm 87 is moved to the other dotted-line position, oil will be delivered through the pipe 90 to the motor 91, and the shaft 92 will be driven in a direction to propel the truck rearwardly, the oil returning through the pipe 89. It will be apparent, therefore, that both the raising and lowering movements of the platforms and the propulsion of the device from place to place are accomplished by means of fluid pressure generated by the pump 68, which is in turn driven by the motor 64. Moreover, these movements may all be controlled from either platform at a point adjacent the upper platform. It may here be noted that the control arms 84 and 87, as shown in Fig. 4, protrude beyond the upper platform so that they may be readily accessible. As the pump is one of the positive displacement type, no brake is necessary as the motor will lock when the oil pressure is shut off.

A drain line 96 leads from the pump 68 to the supply tank 71 and, similarly, a drain line 97 leads from the motor 91 to the oil supply tank.

The truck may be steered by means of the steering arm 98 (Fig. 4) which is connected to the pulley 26 by the extensible connection 99 similar to the extensible connections described for the control arms 84 and 87. The upper end of this connection is likewise rotatably mounted in a bracket 100 secured to the shield 54 just below the platform 50 in a position conveniently accessible to an operator upon the platform. As will be apparent, turning the pulley 26 in one direction or the other will move the cable 24 and thus turn the steering wheel 15.

A reel 101 is rotatably mounted at the forward end of the truck, this reel having wound thereabout a cord 102 having on the end thereof a plug 103 for connection to a wall socket to enable current to be supplied to the motor 64 and, at the same time, permit the truck to be moved from place to place. An electric cable 104 leads from the reel 101 to a junction box 105 from which the cable 106 leads to the motor 64. A second cable 107 leads from the junction box to a reel 108 rotatably mounted on the frame adjacent the staff, and a cable 110 leads from this reel to a push-button switch 111 mounted on the shield 54 adjacent the upper end thereof, so that this push-button control may be reached from either of the platforms. It will be understood that this push-button switch connects the wires in the cable 104 with those of the cable 106 to control the operation of the motor, so that an operator on either of the platforms can control the movements of the device from place to place, as well as the raising and lowering of the platforms.

The upper platform 50 is provided with an elongated slot 50a which will be found useful in anchoring a chair or seat upon the upper platform and will also be useful in supporting planking or the like which may extend from the platform 50 of one of the devices to the platform of a second device when two are used together. In other words, two of the devices may be placed in parallel relation and planks may extend from them with their ends resting upon the two platforms, thus making a continuous staging therebetween. These planks may be anchored in place by having pins or nails projecting from their ends, which pins or nails will be received in the slots 50a. As shown more especially in Fig. 1, the outlet 37 which leads from the lower end of the cylinder 32 is provided with a coupling 37a

which may be quickly disconnected when it is desired to raise the staff comprising the shield 54, cylinder 32 and ram 34, from the truck.

In Figs. 9 and 10 of the drawings, we have shown a slightly modified form of our invention in which the truck is arranged to rest upon a track or rails. In this instance, the truck will be provided with forward and rear axles 115 and 116 upon which are mounted flanged wheels 117 so that they will follow the rails, and, in this case, the forward steering wheel will be raised so that it is no longer in contact with the ground or floor. In other respects this modification is constructed similarly to that shown in Figs. 1 to 8.

In Figs. 11 to 15 of the drawings, we have shown a modified form of our invention in which two movable rams are employed with a cylinder on the base in order to provide for a greater range of elevation of the platforms. The construction is similar to that previously described except that means must be provided for preventing the turning of the platforms, and also to limit the movement of the rams to prevent the ram from being driven from the corresponding cylinder.

As shown in the sectional view of Fig. 11, a cylinder is removably supported upon the base as shown at 120 which is similar to the cylinder 32, shown in Fig. 6, and supported from the base in the same way. Upon each side of this cylinder is provided a guide rib 121, these ribs extending longitudinally or vertically of the cylinder and being at diametrically opposite points.

Movably mounted within this cylinder is a hollow ram 122, at the upper end of which is a collar 123 to which is secured shield portions 124. As shown in Figs. 13 and 14 these shield portions are of segmental form and, while they extend longitudinally substantially the full length of the cylinder, their edges do not meet so that a space is left therebetween. Secured to the lower ends of the shield members 124, as shown in Fig. 14, are guide segments 125. The edges of these guide segments are spaced apart so as to cooperate with the ribs 121 and prevent turning movement of the ram 122 in the cylinder 120. The segments 125 are quite shallow, as shown in Fig. 11.

Slidably mounted within the hollow ram 122 is a second ram 126, and removably mounted in the upper end of this ram is a plug 127 similar to the plug 47. This plug carries a plate 128 to which is secured the upper stage or platform 129 in the same manner as is described in connection with the embodiment shown in Figs. 1 to 8.

Secured to the upper end of the ram 126 is a plate 130 to which is secured a covering shield 131 of rectangular cross section, as shown in Fig. 12. As will be apparent, this shield will telescope over the members 124, which in turn telescope over the cylinder 120. The lower stage 132 is secured to the shield 131 just as the platform 58 is secured to the shield 54.

A guide channel 134 is secured at the inner surface of one side of the shield 131, as shown in Fig. 12, this guide being closed at the bottom by a projecting lug 135. Within the channel 134 is adapted to slide a key 136 secured to the collar 123 so that the key 136 is fixed to the ram 122. This guides the ram 126 in its movements within the ram 122 and prevents any relative turning movement between the two rams so as to prevent turning movements of the platform. From Figs. 12 and 13, it will be noted that the channel guideway 134 and the key 136, which slides therein, are disposed between the spaced ends of the shield members 124 so that the guide channel can project inwardly between these members to receive the key 136 which projects outwardly from the ram 122.

As also shown in Fig. 11, the controls are arranged in three telescoping sections so that they will follow the movements of the rams 122 and 126. One of these controls is shown in Fig. 11 in the drawings, which comprises the three sections 138, 139, and 140, the upper section 140 telescoping into the section 139 and the latter in turn telescoping into the lower section 138. The upper section 140 is secured to the shield 124 in the same manner as described in connection with the control sections 85 and 86 of Fig. 6.

It may sometimes be desirable to space the platforms 50 and 58 a greater distance apart in order to permit standing room for workmen on the lower platform. We have shown in Fig. 16 a convenient method of raising the upper platform when this is desired. As shown in this figure of the drawings, a spacing post 145 has a reduced lower end 146 which may be received in the upper end of the hollow ram 34, thus replacing the plug 47 when the latter is removed, together with the platform 50. The reduced lower end of this sleeve provides an annular shoulder 147 which may rest upon the plate 53 so as to support the post 145. The upper end of the post 145 is bored out as shown at 148 to receive the pin 47 so as to mount the platform 50 thereon.

In order that the controls may be also extended upwardly to a point adjacent the platform 50 when it is raised by the use of a spacing post 145, the stem 86 of each of the control members is extended through the control arm 87, and slidably received on this stem is a square sleeve 149, the upper end of which is connected to a control arm 150 rotatably carried by a bracket 151 secured to the spacing post 145. Also secured to the post 145 is a lug 152 having a pin 153 which is received in an opening in the plate 53 to prevent the post from turning, while the platform 50 is prevented from turning on the post by a pin 155 secured to the plate 48 which is received in an opening in a lug 156 secured to the post. When the platform 50 is supported as shown in Fig. 6, the overall height is such as to permit the device to pass through the usual door.

While we have shown and described some preferred embodiments of our invention, it will be understood that it is not to be limited to all of the details shown, but is capable of modification and variation within the spirit of the invention and within the scope of the claims.

What we claim is:

1. A portable scaffolding comprising a frame, a cylinder supported by said frame and rising vertically therefrom, a ram reciprocally supported in said cylinder, an upper platform supported by said ram, a shield supported at the upper end of the ram and extending downwardly therefrom in external telescoping relation with the cylinder, and a lower platform secured to said shield in spaced relation to the upper platform.

2. A portable scaffolding comprising a frame, a cylinder supported by said frame and rising vertically therefrom, a ram reciprocally supported in said cylinder, an upper platform supported by said ram, a shield supported at the upper end of the ram and extending downwardly therefrom in telescoping relation with the cylinder, a lower platform secured to said shield in

spaced relation to the upper platform, and means for preventing rotation of the platforms with respect to the cylinder, said means comprising a guide member secured to the cylinder and a key secured to the shield and slidably received in said guide member.

3. A portable scaffolding comprising a wheeled frame, a staff rising from the frame and comprising an outer cylinder and a ram slidably received within the cylinder, an upper platform supported by said ram at the upper end thereof, means for supplying fluid pressure to said cylinder to raise said ram, fluid-pressure operated means to drive the wheels of said frame to propel the scaffolding from place to place, a shield member secured to the ram adjacent the upper end thereof and extending downwardly to embrace the cylinder, and a lower platform supported by the shield member in spaced relation to the upper platform, and controlling means for said supplying means and for said propelling means, both said controlling means being positioned between said platforms to be accessible from both thereof.

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