

Sept. 17, 1946.

T. G. DI SANTI

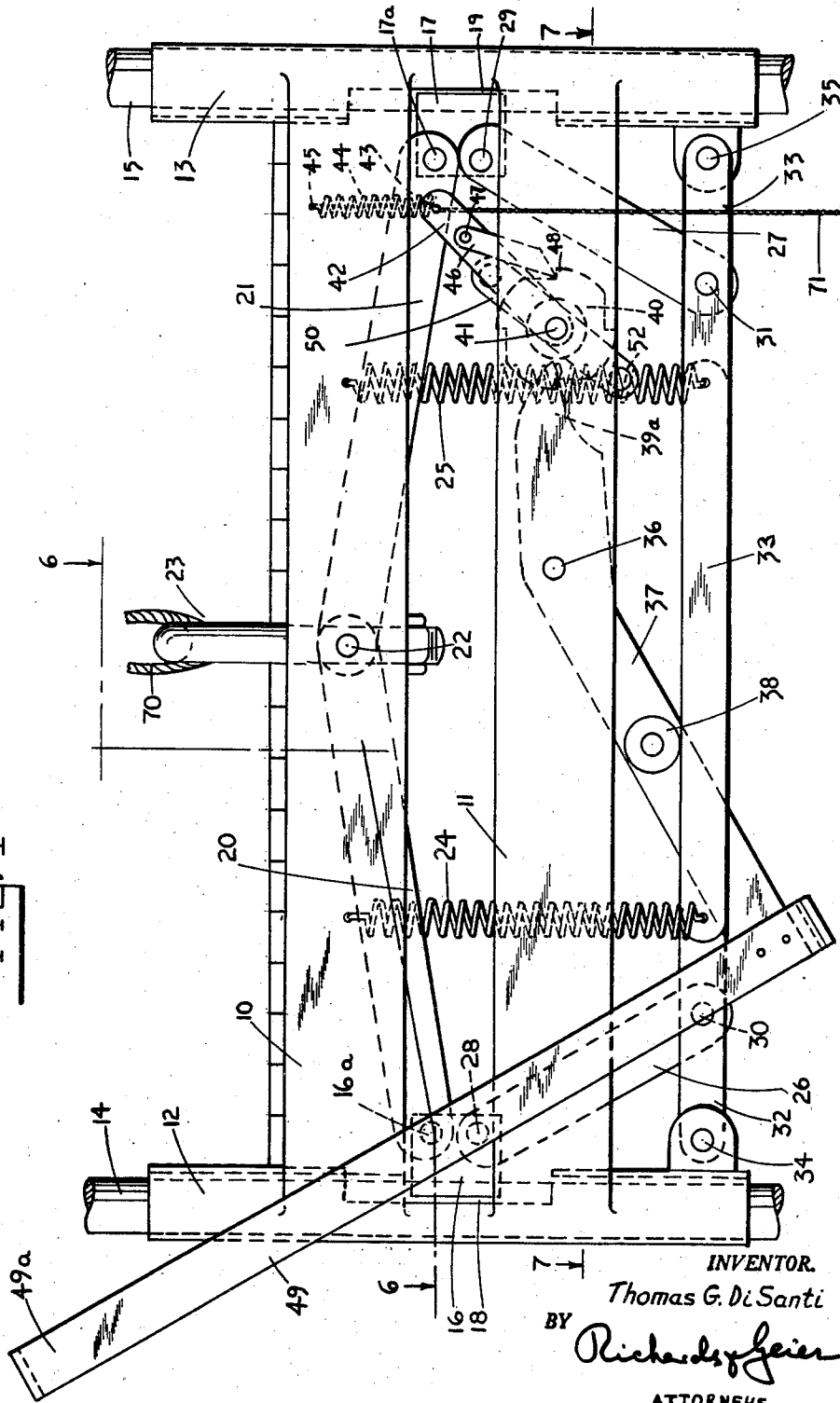
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4 Sheets-Sheet 1

Fig. 1



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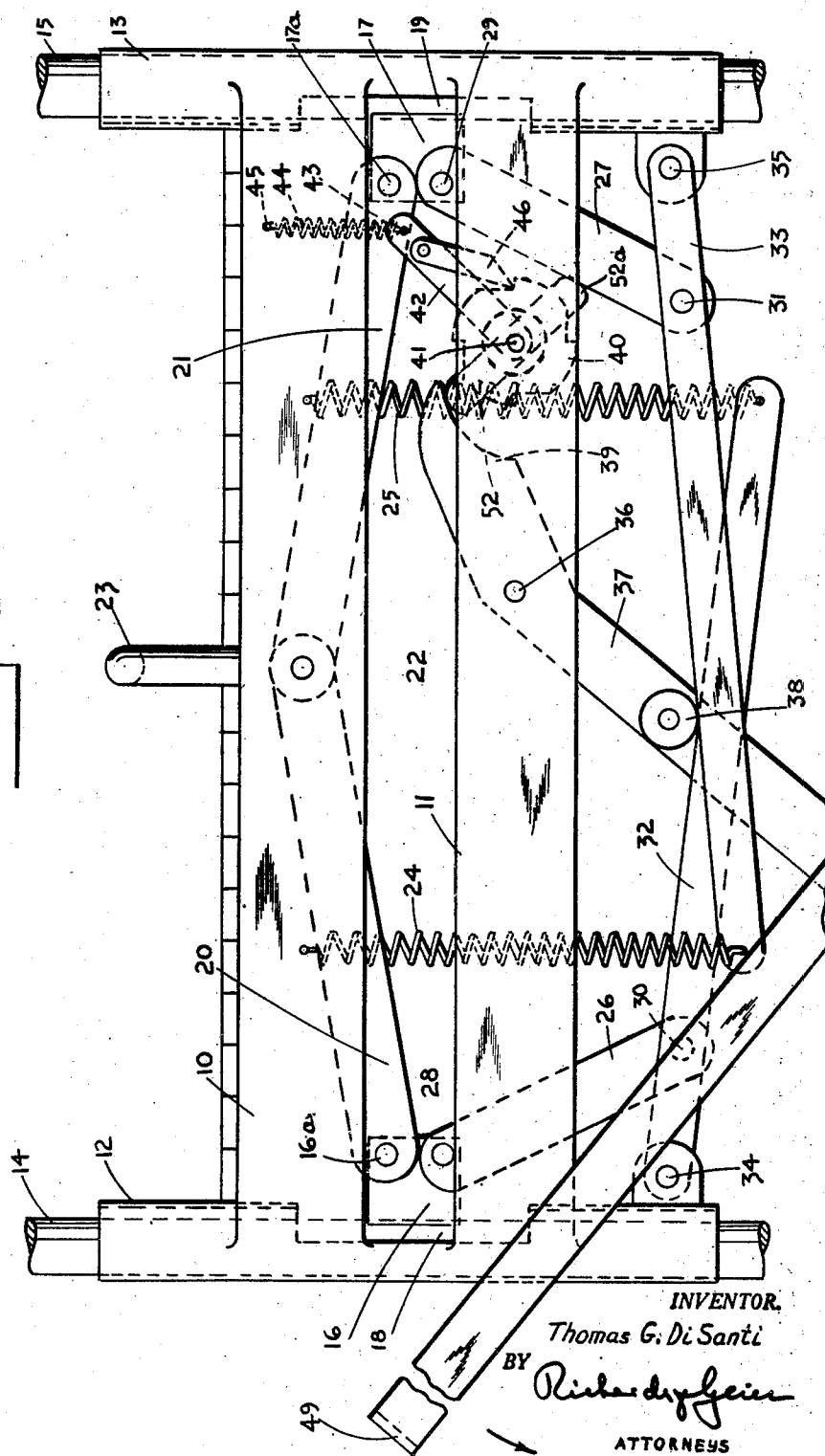
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Fig. 2



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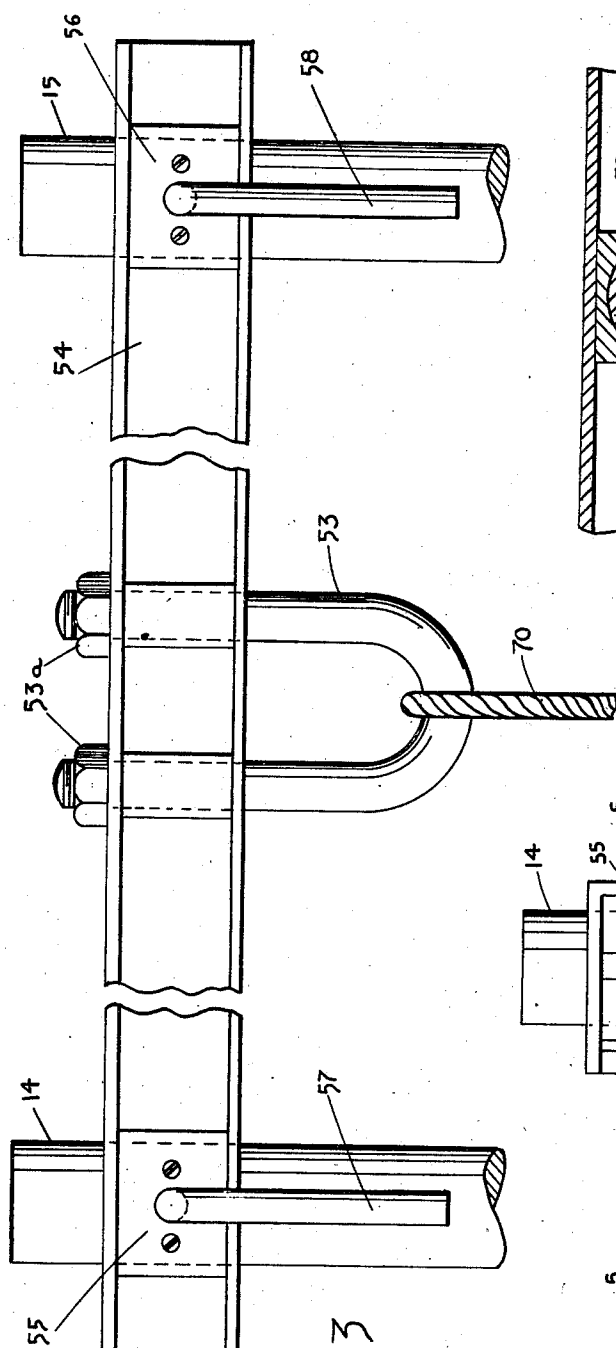


Fig. 3

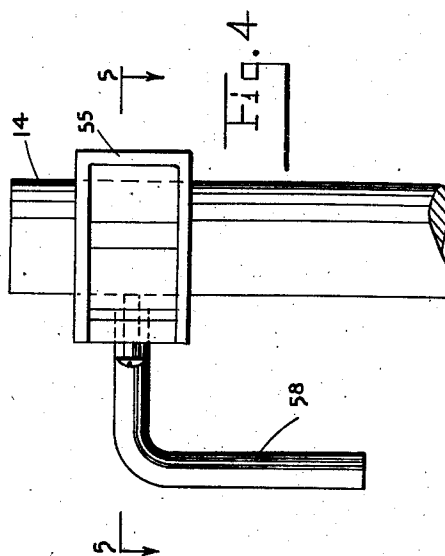


Fig. 4

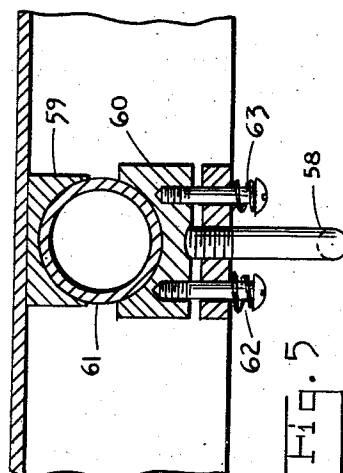


Fig. 5

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Fig. 6

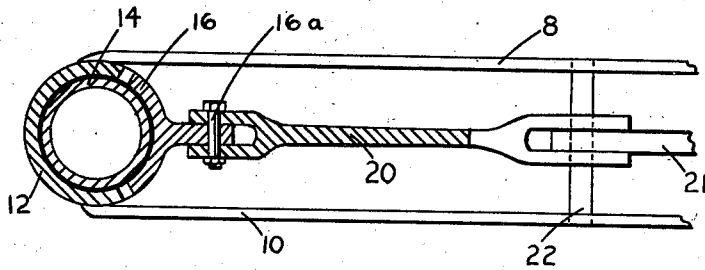


Fig. 7

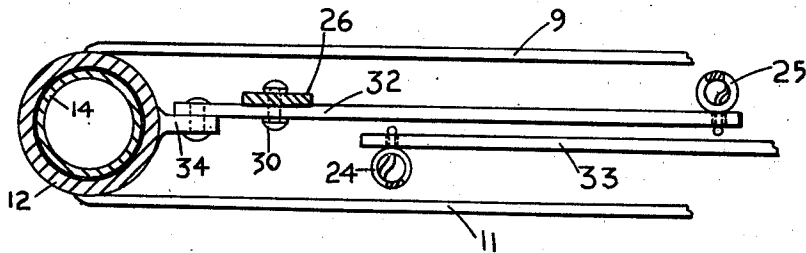
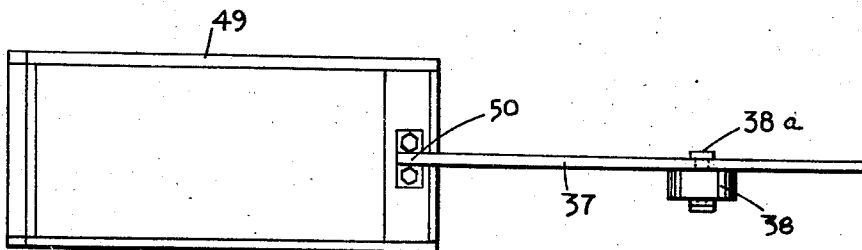


Fig. 8



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UNITED STATES PATENT OFFICE

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Application May 3, 1945, Serial No. 591,686

5 Claims. (Cl. 304-18)

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This invention relates to scaffolds and refers, more particularly, to adjustable scaffolds which can be used in building operations and for other kinds of work and which are so constructed that the platform of the scaffold can be raised and lowered at will.

An object of the present invention is the provision of a scaffold which is simple in construction and inexpensive to manufacture and which can be conveniently utilized in building operations of various types.

Another object is the provision of a scaffold which is reliable and safe in operation and which is so constructed that no serious accidents can be caused by any negligence in operating the scaffold.

Yet another object is a provision of a scaffold which is provided with a continuously operating braking means holding the scaffold, the scaffold being movable only when these means are maintained in a released position.

Still another object is the provision of a conveniently operated locking device which may be used to facilitate continuous movement of the scaffold.

Other objects of the present invention will become apparent in the course of the following specification.

In accomplishing the objects of the present invention, it was found desirable to provide a scaffold having brake shoes which are urged by springs to press continuously against the posts of the scaffold and thereby hold it securely in position. The brakes are released through the manipulation of a lever which can be locked in an inoperative position through the use of a suitable locking device.

The invention will appear more clearly from the following detailed description when taken in connection with the accompanying drawings showing, by way of example, a preferred embodiment of the inventive idea.

In the drawings:

Figure 1 shows a scaffold in front elevation with the brakes in the operative locking position;

Figure 2 is similar to Figure 1 and shows the scaffold with the brakes locked in the inoperative position;

Figure 3 illustrates in front elevation the rope supporting means which are used to operate the scaffold;

Figure 4 is a side view of the device shown in Figure 3;

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Figure 5 is a section along the line 5-5 of Figure 4;

Figure 6 is a section along the lines 6-6 of Figure 1;

Figure 7 is a section along the lines 7-7 of Figure 1;

Figure 8 is a detail view illustrating the lever which operates the brake mechanism.

The scaffold frame shown in the drawings consists of four rigid frame elements 8, 9, 10, 11, attached permanently to two sleeves 12, 13, sliding over two vertical posts 14, 15. Two other posts carry a similar scaffold frame (not shown). The flooring of the scaffold, which is also not shown, extends between the two scaffold frames.

The scaffold frame is prevented from sliding down the vertical rods 14, 15 by two brake shoes 16, 17, made of wear resistant material and in contact with vertical rods 14, 15, through openings 18, 19, provided in the sleeves 12, 13. The brakes 16, 17 are held in position by two bars 20, 21 having a common swivel joint on pinion 22 in the center of rigid members 8 and 10 at an equidistant point between sleeves 12, 13. A U-shaped hanger 23 is connected to the frame members 8 and 10 by any suitable means and is used for hooking the block and tackle ropes 70 to hoist the scaffold.

It is apparent that the scaffold as a whole will have a normal tendency to exert pressure upon brakes 16, 17 causing these latter to become wedged firmly against vertical posts 14, 15. The links 20 and 21 are connected to the brake shoes 16 and 17 with a certain amount of play. The wedging action is further increased by tension of springs 24, 25 through a system of connecting links 26, 27 mounted at one end on pinions 28, 29 on brakes 16, 17, and at the other end on pinions 30, 31 in folding arms 32 and 33. Arm 32 has one end fastened to a pinion 34 at the lower end of sleeve 12. The other end of vertically folding arm 32 is fastened to the end of spring 25. Thus the tension of spring 25 exerts a constant vertical pull upon arm 32. This pull is developed into pressure through the lever formed by the relative position and swinging connections of the link 26 connecting arm 32 to brake 16 and fastened by pinions 28, 30. The pressure developed in this lever arrangement increases the pressure of brake 16 against its vertical post 14, thereby firmly holding the scaffold in a stationary position. The upper ends of springs 24, 25 are fastened to the transverse frame element 10. The purpose of these springs is to exert pressure on the brakes 16, 17, as above

mentioned, through levers and links 32, 26, and 33, 27.

It may be noted that spring 24 on the left hand side of the drawings (looking in the direction of Figure 1) blocks brake 17 on the right hand side of this drawing and that spring 25 on the right hand side of the drawing blocks brake 16 on the left hand side of this drawing.

The entire mechanism operates simultaneously and is intended to distribute an equal pressure on brakes 16, 17 under tension of springs 24, 25 upon arm 32 mounted on pinion 34 and arm 33 mounted on pinion 35.

The transversal supporting beam or frame element 11 has one of its ends fastened to sliding sleeve 12, while the other end is fastened to sleeve 13.

Beam 11 is provided with a pinion 36 upon which fulcrums a lever 37 carrying a pulley wheel 38 resting upon the upper edges of folding arms 32, 33 and causing a downward swing of these arms. The nose 39 of this lever may rest against a locking bar 50 fastened to a ratchet wheel 40 rotatably mounted on pinion 41. One end of an arm 42 pivots on pinion 41, while its other end 43 is pulled vertically upward by spring 44 fastened at point 45 on upper beam or frame 10. This upward motion displaces a pawl 46 mounted on pinion 47 on arm 42 and having a sharp point 48 which engages into a tooth of ratchet wheel 40, thus preventing the counter-clockwise rotation of the ratchet wheel 40 (looking in the direction of Figure 1).

A hand or foot operated release lever 49 has the form of a hollow frame and is firmly attached to the lower end of lever 37, thus forming a permanent right angle with the lever 37.

The ratchet wheel 40 rotates along with the locking bar 50 which is firmly connected thereto and which has rounded ends 52 and 52a of this arm coming intermittently in contact with a concave section 39a at lever 37.

The scaffold is hoisted by a block and tackle running from hook 23, shown in Figures 1 and 2, to hook 53 in Figure 3, fastened by bolts 53a on a beam 54. The beam 54 slides up or down on the vertical rods 14, 15 and is held in a steady position by clamps 55, 56 which are tightened by screw handles 57, 58.

As shown in Figure 5, each of the clamps 55 or 56 consists of two semi-circular jaws 59, 60 fitting closely around rod 15. Jaw 60 is adjusted by turning screw handle 58 and is held in position by two sliding bolts 62 and 63.

The described scaffold is operated as follows: The brakes are unlocked to allow the hoisting or the lowering of this scaffold by pushing down the upper end 49a of control lever 49. The action of the mechanism is as follows: When lever 49 is pushed down along with the lever 37, the pulley wheel 38 riding along the upper edges of folding arms 32, 33 will describe a downward curved motion involving pressure of this wheel upon arms 32, 33 and causing these latter to fold downwardly while pulling down link arms 26, 27 fastened on brakes 16, 17, thus causing these brakes to be displaced away from their points of friction on vertical rods 14, 15.

When control lever 49 is released, springs 24, 25 pull up folding arms 20, 21 and arms 32, 33 to their original position. During this motion lever 37 swings downward around its pinion 36 and presses down its concave curved nose 39 on the locking bar 50. Then the brakes 16, 17 are

locked and the scaffold is prevented from sliding down the vertical rods 14, 15.

The self wedging action of brakes 16, 17 is an important feature of the present invention enabling the operator to anchor the scaffold easily and safely at any height desired.

This invention provides safe, efficient and practical means to enable one person to hoist or lower the novel scaffold herein described with a minimum of efforts and with a maximum ease of control due to the automatic self wedging brake actions involved.

It is apparent that when the lever 49 is swung about the pivot 36 from the locking position shown in Figure 1 to the unlocked position shown in Figure 2, the nose 39 is raised from the bar 50 provided that the bar 50 at that time is in the position shown in Figure 1.

Usually the operator will raise or lower the scaffold by pulling at the rope 70 while holding the lever 49 in its open position through the application of hand or foot pressure.

In certain instances, however, it is desirable to maintain the lever 49 in its open position. The bar 50 which is used for this purpose can be conveniently swung into its locked position by pulling at the cord 71 which is attached to the lever 42 at 43.

If the cord 71 is pulled it will cause the lever 42 to swing about the pivot 41 thereby expanding the spring 44.

In the course of this swinging motion the pawl 46 will press against the ratchet wheel 40 and will rotate this wheel along with the bar 50 which is firmly attached thereto.

As a result of this rotation the bar 52 will be moved to position shown in Figure 2 in which the end 52 of the bar 50 is in engagement with the nose 39.

As soon as pressure on the cord 71 is released the spring 44 contracts and will swing the link 42 about the pivot 41 while the pawl 46 will slide over the teeth of the ratchet 40. A spring (not shown) may be used to facilitate the insertion of the pawl 46 into engagement with an adjacent tooth of the ratchet 40.

It is apparent that if pressure upon the outer end of the lever 49 is released at that time, the pressure of the springs 24 and 25 will merely strengthen the engagement of the nose 39 with the bar 50.

In order to release the lever 49 and to cause the brake shoes 16 and 17 to press against the posts 14 and 15 it is merely necessary to move the bar 50 out of engagement with the nose 39 in the manner hereinbefore described.

It is apparent that the described scaffold provides a simple and effectively operating construction by means of which the frame of the scaffold is always maintained in its locked position upon the posts so that there is no danger that accidents may be caused as the result of a negligent operation of the scaffold.

It is further apparent that the illustration shown above has been given solely by way of illustration and not by way of limitation and that the described construction is subject to wide variations and modifications without exceeding the scope or intent of the present invention; all of such variations and modifications are to be included within the scope of the present invention.

What is claimed is:

1. In a scaffold, in combination with a post, a sleeve slidable upon said post, a brake adapted

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to engage said post, a link having an end pivoted to said brake, an arm pivoted to said sleeve, said link having another end pivoted to said arm intermediate the ends of the arm, a frame element carried by said sleeve, a spring carried by said frame element and connected with said arm for maintaining said brake in engagement with said post, a lever, and means connected with said lever and engaging said arm for releasing pressure upon said brake when said lever is actuated.

2. In a scaffold, in combination with a pair of posts, sleeves slidably mounted upon said posts, at least one upper frame element extending between said sleeves and firmly connected thereto, at least one lower frame element extending between said sleeves and firmly connected thereto, said sleeves having recesses therein, brakes adapted to engage said posts in said recesses, links having ends pivotally connected to said brakes, two arms extending side by side and having opposed ends pivotally connected to separate sleeves, said links being pivotally connected to separate arms intermediate the ends of the arms, springs having upper ends connected to said upper frame element and lower ends connected to the other ends of said arms, whereby said brakes are maintained by said springs in engagement with said posts, a lever swingably mounted upon said lower frame element, and a roller carried by said lever and engaging said two arms, said roller depressing said arms to release pressure upon said brakes when said lever is swung.

3. In a scaffold, in combination with a pair of posts and rope-actuated hoisting means thereon, sleeves slidably mounted upon said posts, at least one upper frame element extending between said sleeves and firmly connected thereto, at least one lower frame element extending between said sleeves and firmly connected thereto, said sleeves having recesses therein, brakes adapted to engage said posts in said recesses, a rope-engaging element carried by said upper frame element for hoisting the scaffold, elongated connecting mem-

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bers having ends pivotally connected to said brakes and other ends pivoted to said upper frame, links having ends pivotally connected to said brakes, two arms extending side by side and having opposed ends pivotally connected to separate sleeves, said links being pivotally connected to separate arms intermediate the ends of the arms, springs having upper ends connected to said upper frame element and lower ends connected to the other ends of said arms, whereby said brakes are maintained by said springs in engagement with said posts, a lever swingably mounted upon said lower frame element, and a roller carried by said lever and engaging said two arms, said roller depressing said arms to release pressure upon said brakes when said lever is swung.

4. In a scaffold, in combination with a post, a brake adapted to engage said post, means for pressing said brake against said post, a lever connected with said means and movable to a releasing position for releasing pressure upon said brake, said lever having a free end, a ratchet wheel, a pawl-carrying lever, means supporting said ratchet wheel and said pawl-carrying lever for rotation, a pawl upon said pawl-carrying lever for engagement with said ratchet wheel to turn the ratchet wheel in one direction, and a locking bar firmly connected to said ratchet wheel and rotatable therewith to a position wherein it locks said releasing lever in its releasing position.

5. In a scaffold, in combination with a post, a sleeve slidable upon said post, a brake adapted to engage said post, a link having an end pivoted to said brake, an arm pivoted to said sleeve, said link having another end pivoted to said arm intermediate the ends of the arm, spring means connected to said arm for maintaining said brake in engagement with the post, and leverage means in operative connection with said arm for releasing pressure upon said brake when said leverage means is actuated.

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