May 10, 1949. T. G. DI SANTI 2,469,716

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Filed June 21, 1946 3 Sheets-Sheet 1

Fig. 1

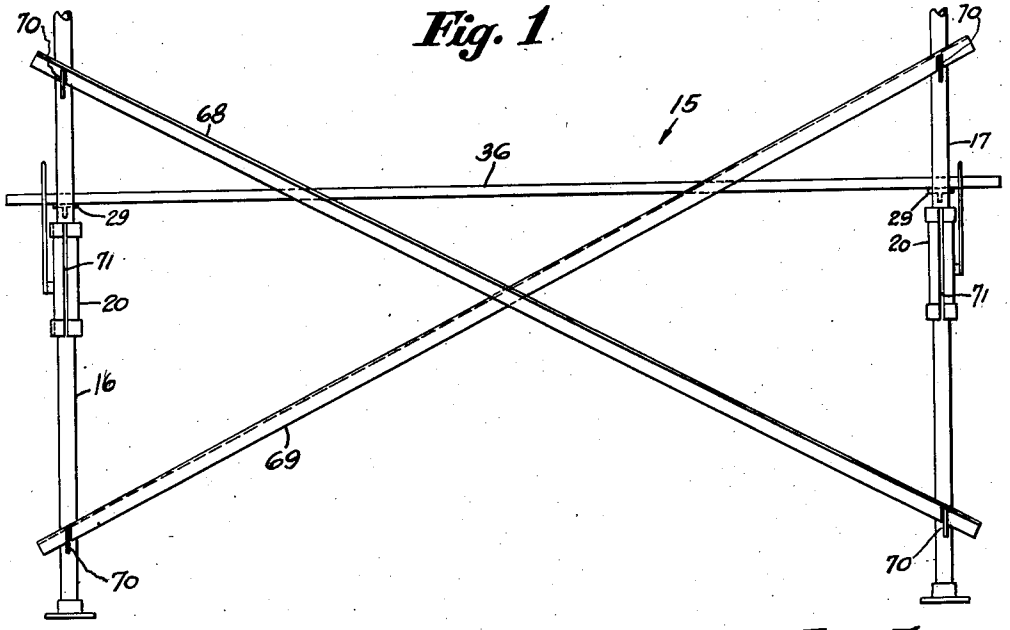


Fig. 5

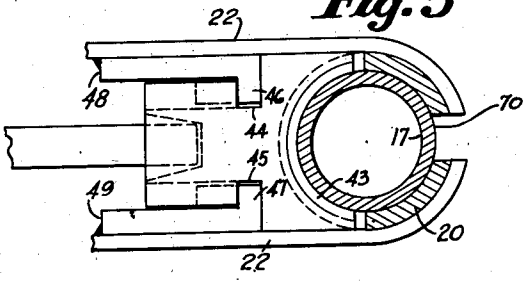
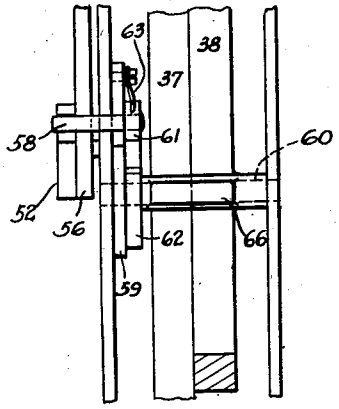


Fig. 7



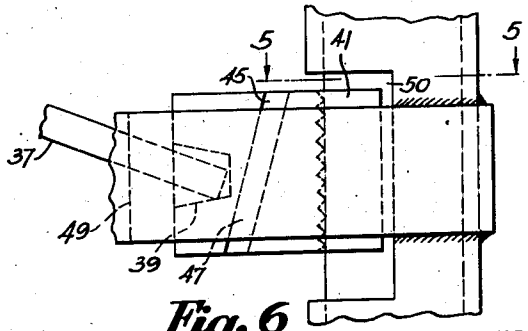


Fig. 6

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May 10, 1949. T. G. DI SANTI 2,469,716

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Filed June 21, 1946 3 Sheets-Sheet 2

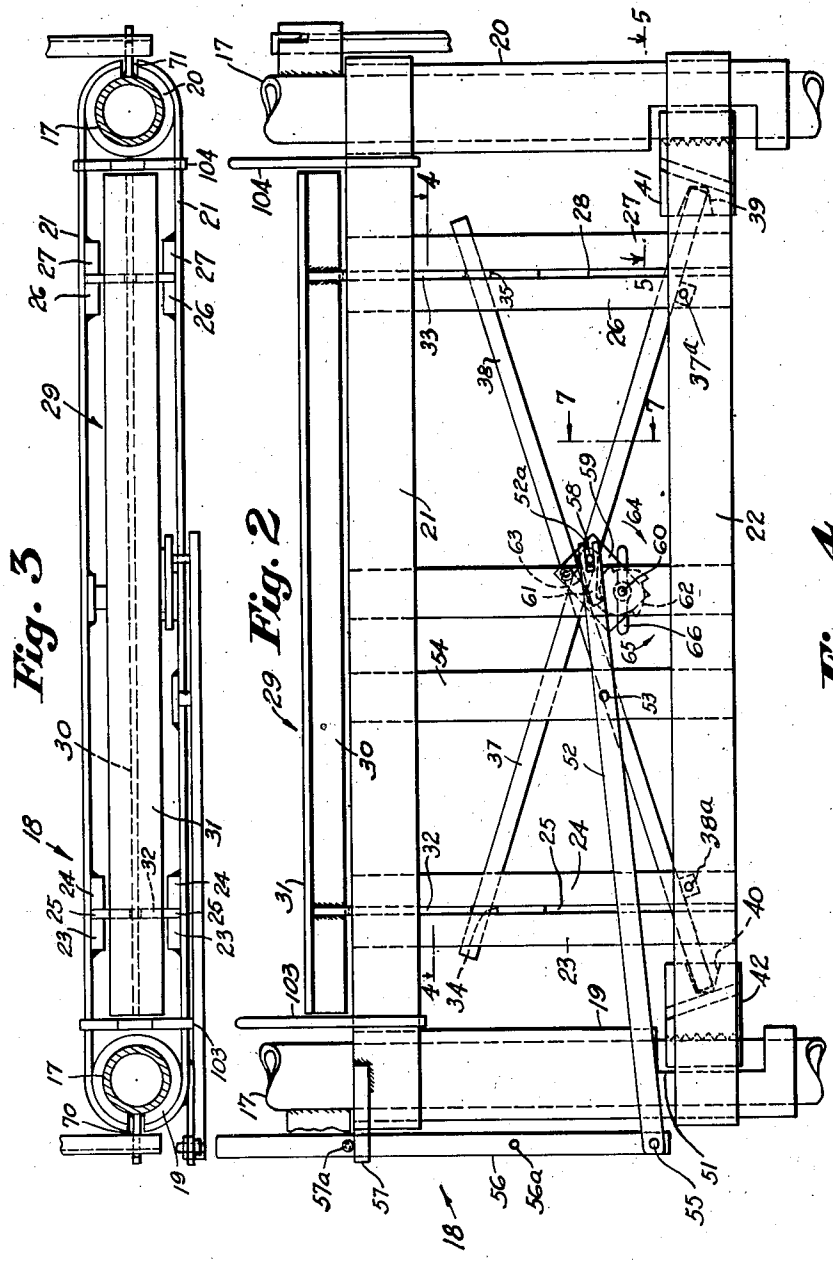


Fig. 3

Fig. 2

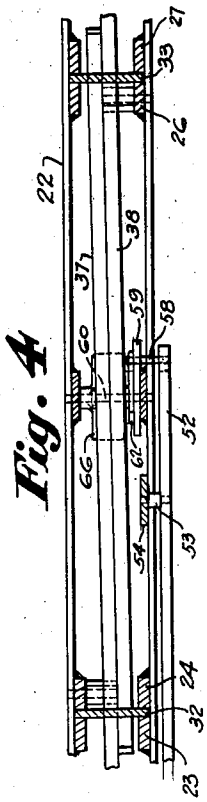


Fig. 4

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May 10, 1949. T. G. DI SANTI 2,469,716

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Filed June 21, 1946 3 Sheets-Sheet 3

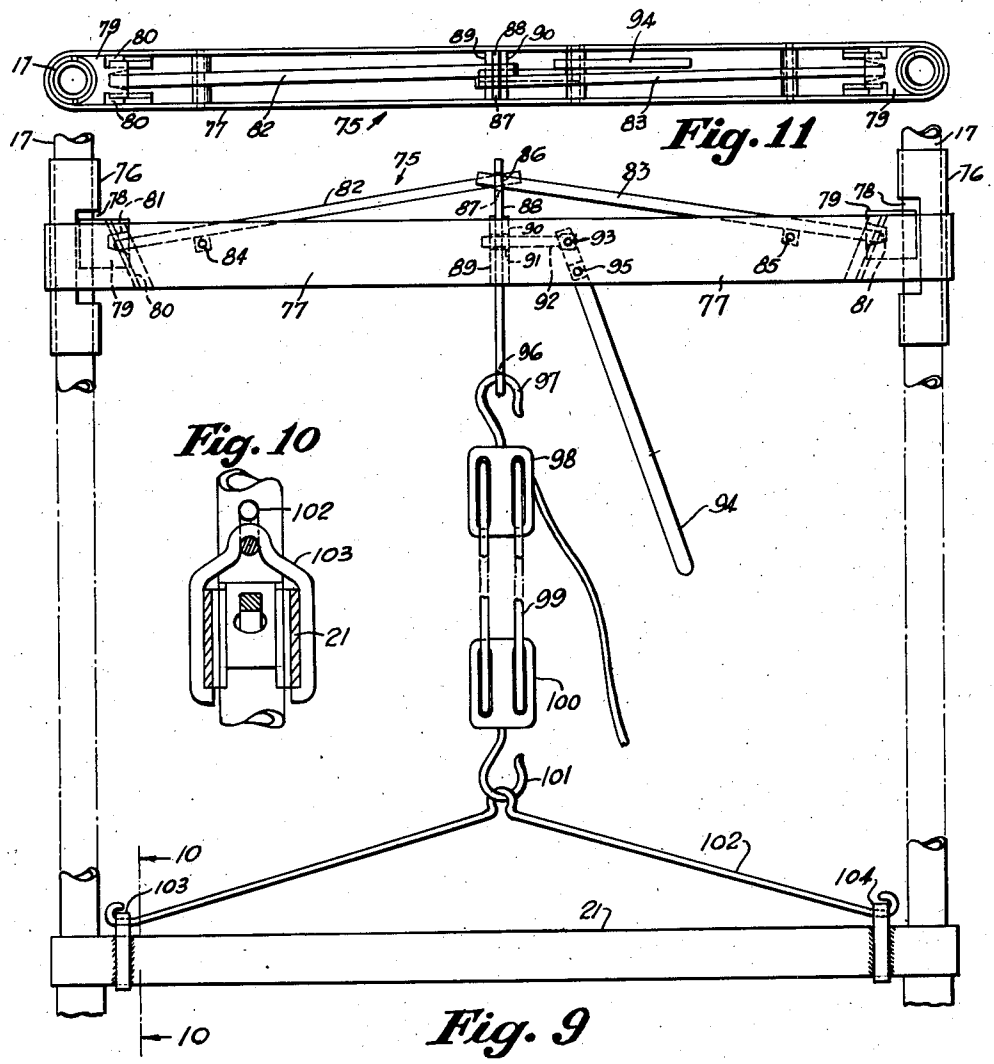


Fig. 11

Fig. 10

Fig. 9

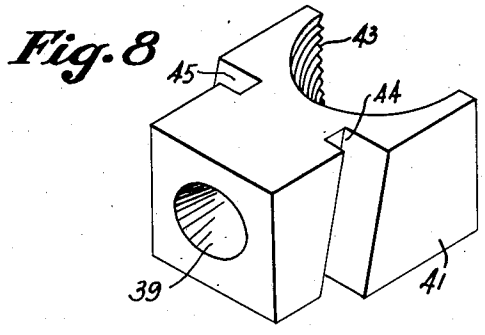


Fig. 8

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Patented May 10, 1949

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UNITED STATES PATENT OFFICE

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Thomas G. Di Santi, Newark, N. J.

Application June 21, 1946, Serial No. 678,286

13 Claims. (Cl. 304—18)

1

This invention relates to scaffolds, and more particularly to the means for releasably gripping and holding same at any desired height.

One object of the invention is to provide a releasable gripping or brake unit which may be used in connection with adjustable scaffolds as well as with passenger and freight elevators in the home, office or factory buildings.

Another object of the invention is the provision of a scaffold which is simple in construction, inexpensive to manufacture, and which is reliable and safe in operation.

Still another object of the invention is to provide a scaffold or other up and down movable device which is provided with a readily operable braking means for holding such device and permitting said device to be moved only when the brake means is released.

Other objects and advantages will appear as the nature of the improvements is better understood, the invention consisting substantially in the novel arrangement and co-relation of parts herein fully described, and illustrated in the accompanying drawings, wherein similar reference characters are used to denote corresponding parts throughout the several views, and then finally pointed out and specifically defined and indicated in the appended claims.

The disclosure made the basis of exemplifying the present inventive concept suggests a practical embodiment thereof, but the invention is not to be restricted to the exact details of this disclosure, and the latter therefore is to be understood from an illustrative rather than a restrictive standpoint.

In carrying out one embodiment of the present invention it was found desirable to provide a scaffold having releasable brake shoes or jaws which are forced against the vertical posts of the scaffold by the weight of the platform to hold same at any adjusted height and to provide means for releasing the said brakes to permit the scaffold to be moved.

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

In the drawings:

Figure 1 is a fragmental elevational front view of a scaffold constructed in accordance with the present invention.

Figure 2 is a front view in elevation of one of the gripping units used in the scaffold construction.

Figure 3 is a plan view of said unit looking from the top of Figure 2.

Figure 4 is a sectional view taken on line 4—4 of Figure 2.

2

Figure 5 is a horizontal sectional view taken on line 5—5 Figure 2 at an enlarged scale.

Figure 6 is an elevational view looking from the bottom of Figure 5.

Figure 7 is a fragmental longitudinal sectional view taken on line 7—7 Figure 2.

Figure 8 is a perspective view of one of the brake shoes or jaws.

Figure 9 is view looking from one side of the scaffold and showing means for supporting and raising the scaffold units upon their posts.

Figure 10 is a fragmental sectional view taken on line 10—10 of Figure 9; and

Figure 11 is a top plan view of one unit of the scaffold supporting means used when raising said scaffold.

Referring now to the drawings in detail 15 indicates a scaffold which comprises two alined tubular posts 16 at the left and two similar posts 17 at the right, only one of each being shown in Figure 1. Each pair of posts 16 and 17 are provided with a gripping or brake unit 18, said brake units being identical in construction and comprise a pair of sleeves 19—20 slidable on their respective posts. The top ends of the sleeves 19 and 20 are connected to each other by means of straps 21 welded to said sleeve ends, the bottom of said sleeves being similarly connected by straps 22. The straps 21 and 22 are connected to each other near the left end by two pair of spaced apart strips 23—24, said strips forming between them longitudinal spaces 25. Similar strips 26 and 27 connect the straps 21 and 22 near their right ends, the said strips leaving a space 28 between them.

Located above and positioned between the straps 21 is a platform 29 which is substantially T-shaped in cross section and comprises a central vertical leg 30 and a horizontal cross bar 31. The vertical rib 30 has welded thereto a leg 32 at the left and a similar leg 33 at the right thereof, the said legs slidably extending into the respective spaces 25 and 28. The leg 32 has an opening 34 near its bottom and the leg 33 has a similar opening 35 similarly located (see Figure 2). The platforms 29 are provided to support the scaffold planking 36 shown in Figure 1.

In order to maintain the units 18 and scaffold planking carried thereby in any desired position and to lower same, a pair of diagonally crossing spring steel bars 37—38 are pivoted respectively at 37^a and 38^a with their respective upper ends protruding through the openings 34 and 35 in the platform legs and their respective lower ends in engagement with tapered openings 39—40 in respectively similar clamping or wedging jaws 41—42. The said jaws (see Figs. 2, 5, 6 and 8) are provided with serrated or threaded semicircular openings 43 for locking engagement with the outer surfaces of their posts 16 or 17. The

said jaws are further provided with inclined slots 44—45 which engage inclined tongues 46—47 on respective plates 48 and 49 welded to the straps 22. The jaws 41 and 42 contact their respective posts through cut-outs 50 and 51 in the sleeves 19 and 20, respectively.

Normally, the weight of the platforms' planking, as well as the people and material supported on the planking, is transferred to the outer upper ends of the spring rods 37 and 38 which causes an upward pressure on the jaws thus tending to move them upwardly on the inclined tongues 46 and 47 and cause the serrated opening surfaces 43 to tightly hug the said posts from the inside and simultaneously wedging same against the inside of the sleeves 19 and 20.

To release the jaws from wedging engagement with the upright posts, there is provided a lever 52 pivotedly mounted at 53 on a vertical strip 54. The outer or left end of the lever 52 has pivotally secured thereto at 55 a link 56 guided for vertical movement in an extension 57 of the sleeve 19. Upon the exertion of an upward pull on the upper end of the link 56, the lever 52 will swing upon its pivot 53 and cause the slotted inner end 52a to exert a pressure against a pin 58 thus swinging a plate 59 about its pivot 60. The pin 58 carries a pawl 61 pressed into engagement with one of the four teeth of a ratchet wheel 62 by means of a spring 63. When the plate 59 is thus swung about its pivot 60 in the direction of the arrow 64 the pawl will ride idly for a distance of 90 degrees until it engages the next tooth, then upon a downward pressure upon the link 56 the plate 59 will be swung in the direction of the arrow 65. The ratchet wheel 62 and plate 66 rotate as a unit either with or about the pivot 60. This swinging of the plate will through the pawl 61 push or rotate the ratchet wheel through an angular distance of 90 degrees and carry with it a plate 66 one end of which will contact the underside of the rods 37 and 38 thus causing a lifting of said rods and a downward push upon the jaws 41 and 42. Inasmuch as the said jaws are slidably mounted on the inclined tongues 46 and 47 a downward movement of said jaws will release the serrated surfaces from contact with the posts and the scaffold will move downwardly until the lever 52 is again swung up and down to break the contact between the plate 66 and rods 37 and 38 to permit the weight of the scaffold to operate the said rods to again wedge the shoes or jaws against the posts.

As an extra precautionary measure, and to insure against unwarranted or accidental operation of the wedge or brake mechanism, the link 56 is provided with a pair of holes 56a, one for each position of the link for the reception of a pin 57a which bears against the projection 57 and prevents downward movement of the link 56 as long as the pin 57a is in position.

The scaffold is reinforced by means of angle irons 68 and 69 suitably connected to extension plates 70 welded to the respective posts 16 and 17, the sleeves 19 and 20 being slotted at 71 to clear the extension plates 70 in the up and down movement of the said sleeves.

In order to raise the scaffold and support same while so doing, two upper brake units 75 are arranged respectively on each pair of posts 16 and 17 in a similar manner to the lower brake units 18, one such upper unit being shown in Figures 9 and 11.

Each of the upper units 75 comprises a pair of sleeves 76 adapted to slide on the respective posts 16 and 17. The said sleeves are connected to each other by means of a steel strap 77 welded to them. The sleeves 76 are each provided with a cut-out 78 in the area where the strap 77 is welded to them, the said cut-outs are provided for the reception or passage and operation of brake shoes or jaws 79. The brake shoes are slidably mounted on inclined slideways 80 securely welded to the strap 77, the arrangement of the shoes 79 and slideways 80 being similar to that of the lower jaws 41 and 42 and slideways 46 and 47. Like the lower brake jaws, the jaws 79 are each provided with a tapered hole 81 for the reception of one end of respective levers 82 and 83, the lever 82 being pivotally mounted at 84 and the lever 83 at 85 on the strap 77. The said levers 82 and 83 are so mounted that they slant upwardly from the respective holes 81 and cross one another at a point 86 near their inner or top ends.

The said upper ends of the levers 82 and 83 pass through a rectangular opening 87 in a plate 88 slidably mounted between two other plates 89—90 welded to the strap 77. The plates 88, 89 and 90 are provided with alined openings 91 for the reception of a bolt 92 pivotally secured at 93 to a hand lever 94 pivoted at 95 on the strap 77. The lower end of the plate 88 has a hole 96 for the reception of a hook 97 attached to a sheave or pulley block 98 having the usual rope or ropes 99 which pass through a lower pulley block 100 having a hook 101 which engages a bail 102 in engagement at its ends with staple like members 103 and 104 welded to the strap 21 of the lower brake unit 18.

In practice when erecting the scaffold, the upper units, with the brake shoes or jaws in released or out of locking contact with the posts, are pulled up the posts to the desired height above the lower units, then by moving the lever 94 to the left, the pin or bolt 92 will be withdrawn from the plate 88 and allowing same to be pulled or slid down by the weight of the scaffold on the hook 97. The two levers 82 and 83 which cross in the hole 87 of the plate 88 will be rocked about their respective pivots to move the shoe engaging ends upwardly and carry the shoes on the inclined slides 80 with them to clamp against the posts. In this position the upper unit is completely braked and the lower unit is then drawn up. This operation is repeated until the scaffold is pulled up to its highest position.

To release the upper brake units so that they may be drawn up, the lower units are first clamped or braked and the scaffold weight released from the hook 97. Plate 88 is then raised until the bolt 92 can again be inserted into the alined holes 91 by rocking the lever 94 to the right. The upper movement of the plate 88 causes the levers 82 and 83 to be rocked about their pivots to release the jaws or shoes from clamping engagement with the posts.

It is apparent that the mechanism of the present invention provides simple and effective construction for at all times maintaining the scaffold in safely locked position upon the posts when men are working thereon, so that there is no danger that accidents may be caused as the result of neglectful operation of the scaffold.

It will also be seen that the brake mechanism of the present invention is just as adaptable for cooperation with elevator cages as it is with scaffolds or any other up and down moving mechanisms. Likewise it will be understood that

when used in connection with an elevator car or cage, and should the supporting cables of such elevator car become broken the weight of the car will act to wedge the brake shoes against the post, the said post becoming wedged also against the sides of the sleeves, thus making it impossible for the car to fall to the bottom, as the greater the weight the greater the clamping or locking tendencies between the brake mechanism and posts.

It is apparent that the illustrations shown above have been given solely by way of illustration and not by way of limitation and that the above examples are subject to wide variations and modifications within the scope of the present invention. All 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 stationary inclined plane, a brake member for engaging said post, said brake member having a hole and an inclined slot, the slot slidably engaging the said inclined plane, a platform positioned above the brake member, an inclined rod in engagement at its upper end with the platform to support its weight and entering at its lower end the brake member hole to force the said brake member upwardly on the inclined plane and wedge against the post, and means for actuating the rod to move the brake downwardly on the inclined plane and release same from wedging engagement with the post.

2. In a scaffold, in combination with a post, a sleeve slidable upon said post, a stationary inclined plane, a brake member for engaging said post, said brake member having a hole and an inclined slot, the slot slidably engaging the said inclined plane, a platform positioned above the brake member, an inclined rod in engagement at its upper end with the platform to support its weight and entering at its lower end the brake member hole to force the said brake member upwardly on the inclined plane and wedge against the post, a pivotally mounted lever, and means carried by said lever for actuating the rod to move the brake downwardly on the inclined plane and release same from wedging engagement with the post.

3. In a scaffold, in combination with a post, a sleeve slidable upon said post, a stationary inclined plane, a brake member for engaging said post, said brake member having a hole and an inclined slot, the slot slidably engaging the said inclined plane, a platform positioned above the brake member, an inclined rod in engagement at its upper end with the platform to support its weight and entering at its lower end the brake member hole to force the said brake member upwardly on the inclined plane and wedge against the post, a pivotally mounted lever, a rotatably mounted ratchet wheel, a release plate carried by the said ratchet wheel, a plate pivotally mounted coaxially with the ratchet wheel, and a spring pressed pawl carried by said pivoted plate for rotating the ratchet wheel as and for the purpose specified.

4. In a scaffold, in combination with a pair of spaced apart posts, a sleeve slidably mounted on each of said posts, a frame including a pair of laterally spaced apart lower frame members extending between said sleeves and firmly connected thereto, said sleeves each having a recess therein, obliquely slidable brakes carried by the said frame members extending inwardly of the said recesses for gripping engagement with the posts, a slidable platform above the brakes and intermediate the posts, the said brakes each having an opening, a pair of resilient rods crossing to form an X with their lower ends engaging the brake holes and supporting the weight of the platforms at their upper ends, means pivotally supporting each rod adjacent its lower end and means for actuating said rods for sliding the brakes out of gripping engagement with the posts.

5. In a scaffold, in combination with a pair of spaced apart posts, a sleeve slidably mounted on each of said posts, a frame including a pair of laterally spaced apart lower frame members extending between said sleeves and firmly connected thereto, said sleeves each having a recess therein, obliquely slidable brakes carried by the said frame members extending inwardly of the said recesses for gripping engagement with the posts, a slidable platform above the brakes and intermediate the posts, the said brakes each having an opening, a pair of resilient rods crossing to form an X with their lower ends engaging the brake holes and supporting the weight of the platform at their upper ends, means pivotally supporting each rod adjacent its lower end, a pivotally mounted lever carried by said frame, and means operated by said lever for actuating said rods for sliding the brakes out of gripping engagement with the posts.

6. In a scaffold, in combination with a pair of spaced apart posts, a sleeve slidably mounted on each of said posts, a frame including a pair of laterally spaced apart lower frame members extending between said sleeves and firmly connected thereto, said sleeves each having a recess therein, obliquely slidable brakes carried by the said frame members extending inwardly of the said recesses for gripping engagement with the posts, a slidable platform above the brakes and intermediate the posts, the said brakes each having an opening, a pair of pivoted resilient rods crossing to form an X with their lower ends engaging the brake holes and supporting the weight of the platform at their upper ends, a pivot carried by the frame, a toothed ratchet wheel rotatable on said pivot, a release plate radiating on two sides of the pivot carried by said ratchet wheel, a plate pivotally mounted on said pivot, a pin on said plate, a spring pressed pawl on the said pin normally in engagement with one of the ratchet wheel teeth, a lever pivotally mounted on the frame and provided with a slot for engagement with the pawl pin for oscillating the plate and pawl carried thereby to bring the said pawl out of engagement with one tooth and to engagement with the next tooth for rotating the ratchet wheel and release plate carried thereby as and for the purpose specified.

7. In combination with a pair of spaced apart posts, a self contained brake unit slidingly supported on said posts, said unit comprising a pair of sleeves one for each post, a frame comprising upper and lower frame members firmly connected to the said sleeves, a platform slidably supported at the upper end of the frame, the lower end of each of said sleeves being provided with a recess, a brake member extending through each of said recesses for clamping engagement with the posts, the said brake members being obliquely slidably carried by the lower frame members, the said brake members each having an opening, a pair of resilient rods crossing to

form an X with their lower ends engaging the brake member holes and their upper ends supportingly engaging the platform, means pivotally supporting each rod adjacent its lower end and means for actuating said rods for sliding the brake members out of gripping engagement with the posts.

8. In combination with a pair of spaced apart posts, a self contained brake unit slidingly supported on said posts, said unit comprising a pair of sleeves one for each post, a frame comprising upper and lower frame members firmly connected to the said sleeves, a platform slidably supported at the upper end of the frame, the lower end of each of said sleeves being provided with a recess, obliquely extending tongues supported on the lower frame members near each sleeve, brake member extending through the sleeve recesses for clamping engagement with the posts and provided with oblique slots for slidable engagement with the said tongues, the said brake members each having a rear hole, a pair of resilient rods crossing to form an X with their lower ends engaging the brake member holes and their upper ends supportingly engaging the platform, means pivotally supporting each rod adjacent its lower end and means for actuating said rods for sliding the brake members out of gripping engagement with the posts.

9. In combination with a pair of spaced apart posts, a self contained brake unit slidingly supported on said posts, said unit comprising a pair of sleeves one for each post, a frame comprising upper and lower frame members firmly connected to said sleeves, a platform extending above the frame intermediate the sleeves, a depending perforated leg near each end of the platform slidable on the frame, the lower end of each of said sleeves being provided with a recess, obliquely extending tongues supported on the lower frame members near each sleeve, brake members extending through the sleeve recesses for clamping engagement with the posts and provided with oblique slots for slidable engagement with the said tongues, the said brake members each having a rear hole, a pair of pivoted resilient rods crossing to form an X with their lower ends engaging the brake member holes and their upper ends extending through the leg perforations and means for actuating said rods for sliding the brake members out of gripping engagement with the posts.

10. In combination with a pair of spaced apart posts, a self contained brake unit slidingly supported on said posts, said unit comprising a pair of sleeves one for each post, a frame comprising upper and lower frame members firmly connected to said sleeves, a platform extending above the frame intermediate the sleeves, a depending perforated leg near each end of the platform, slidable on the frame, the lower end of each of said sleeves being provided with a recess, obliquely extending tongues supported on the lower frame members near each sleeve, brake members extending through the sleeve recesses for clamping engagement with the posts and provided with oblique slots for slidable engagement with the said tongues, the said brake members each having a rear hole, a pair of pivoted resilient rods crossing to form an X with their lower ends engaging the brake member holes and their upper ends extending through the leg perforations and means for actuating said rods for sliding the brake members out of gripping engagement with the posts, said means comprising a pivot carried by the frame, a toothed ratchet wheel rotatable on said pivot, a release plate radiating on two sides of the pivot carried by said ratchet wheel, a plate pivotally mounted on said pivot, a pin on said plate, a spring pressed pawl on the said pin normally in engagement with one of the ratchet wheel teeth, a lever pivotally mounted on the frame and provided with a slot for engagement with the pawl pin for oscillating the plate and pawl carried thereby to bring the said pawl out of engagement with one tooth and to engagement with the next tooth for rotating the ratchet wheel and release plate carried thereby as and for the purpose specified.

11. In a scaffold having a pair of spaced apart posts, in combination, a lower slidable brake unit on said posts and releasably locked against same, means for releasing said lower brake unit, a separate upper brake unit carried by and releasably locked against said posts, said upper brake unit being movable independently from and relatively to said lower brake unit and means for suspending the lower unit from the upper unit so that the said lower unit may be raised upon the posts when in unlocked position relatively to said upper unit.

12. In a scaffold having a pair of spaced apart posts, in combination, a lower slidable brake unit on said posts and releasably locked against same, means for releasing said brake unit, an upper brake unit carried by and releasably locked against said posts, said upper brake unit comprising a sleeve on each of the posts, the said sleeves each having a cut-out, a member for connecting the said sleeves, inclined slides on the said connecting member near each of the posts, brake shoes on the said slides for engagement with each of the posts, said brake shoes extending through the sleeve cut-outs, a pair of levers pivotally mounted on the said connecting members, said levers normally slanting upwards and crossing each other at their upper ends and engaging the brake shoes at their lower ends, a plate slidable on the connecting member and having a hole through which the upper ends of the said upwardly slanting levers pass, means for suspending the lower brake unit from said plate, and a movable bolt passing through the said slidable plate.

13. In combination with a device according to claim 7, a second brake unit on said posts above the first mentioned posts, means for releasably clamping said second brake unit on said posts, and means for suspending the first mentioned brake unit from the second mentioned brake unit.

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