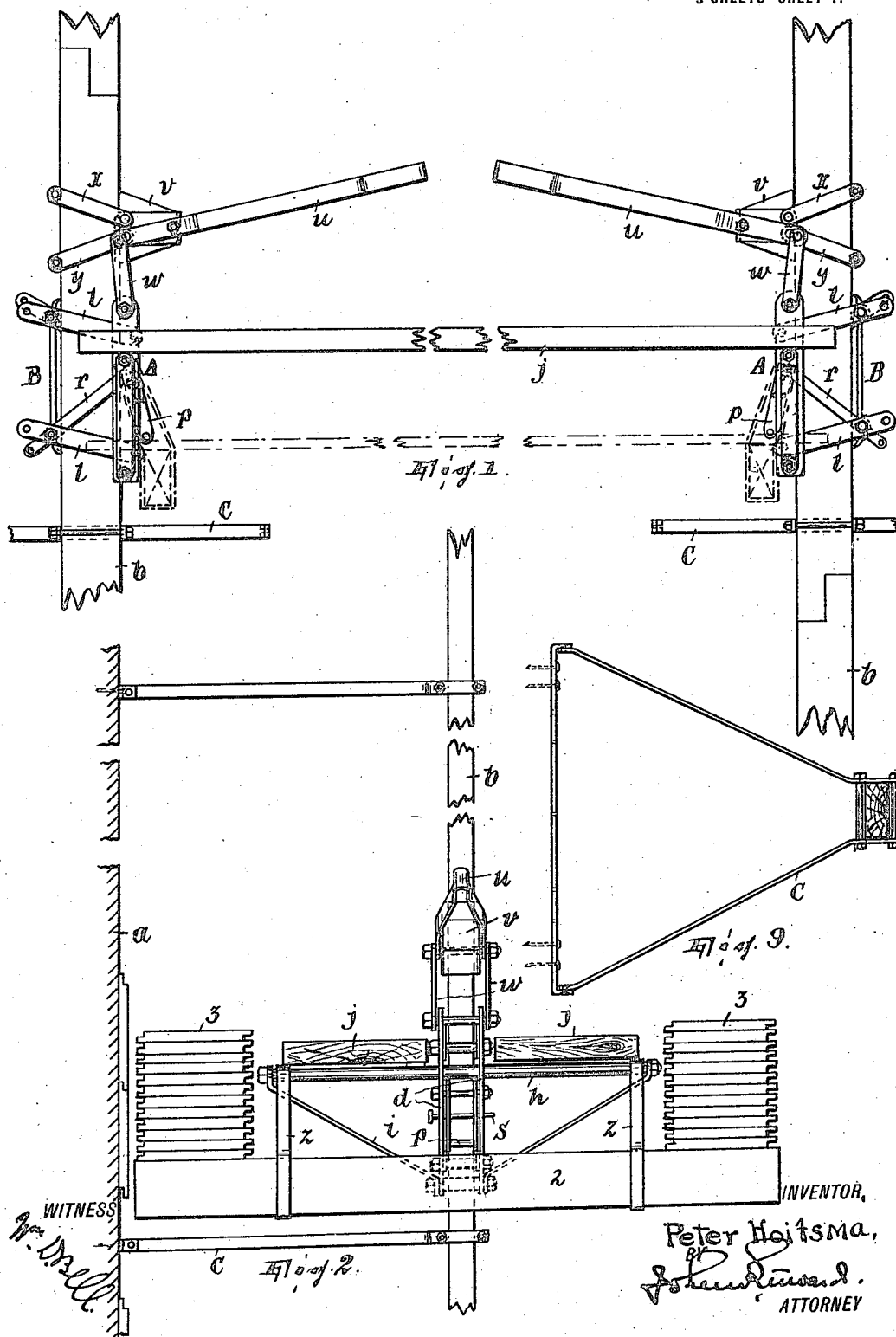


APPLICATION FILED FEB. 14, 1921.

Patented May 16, 1922.

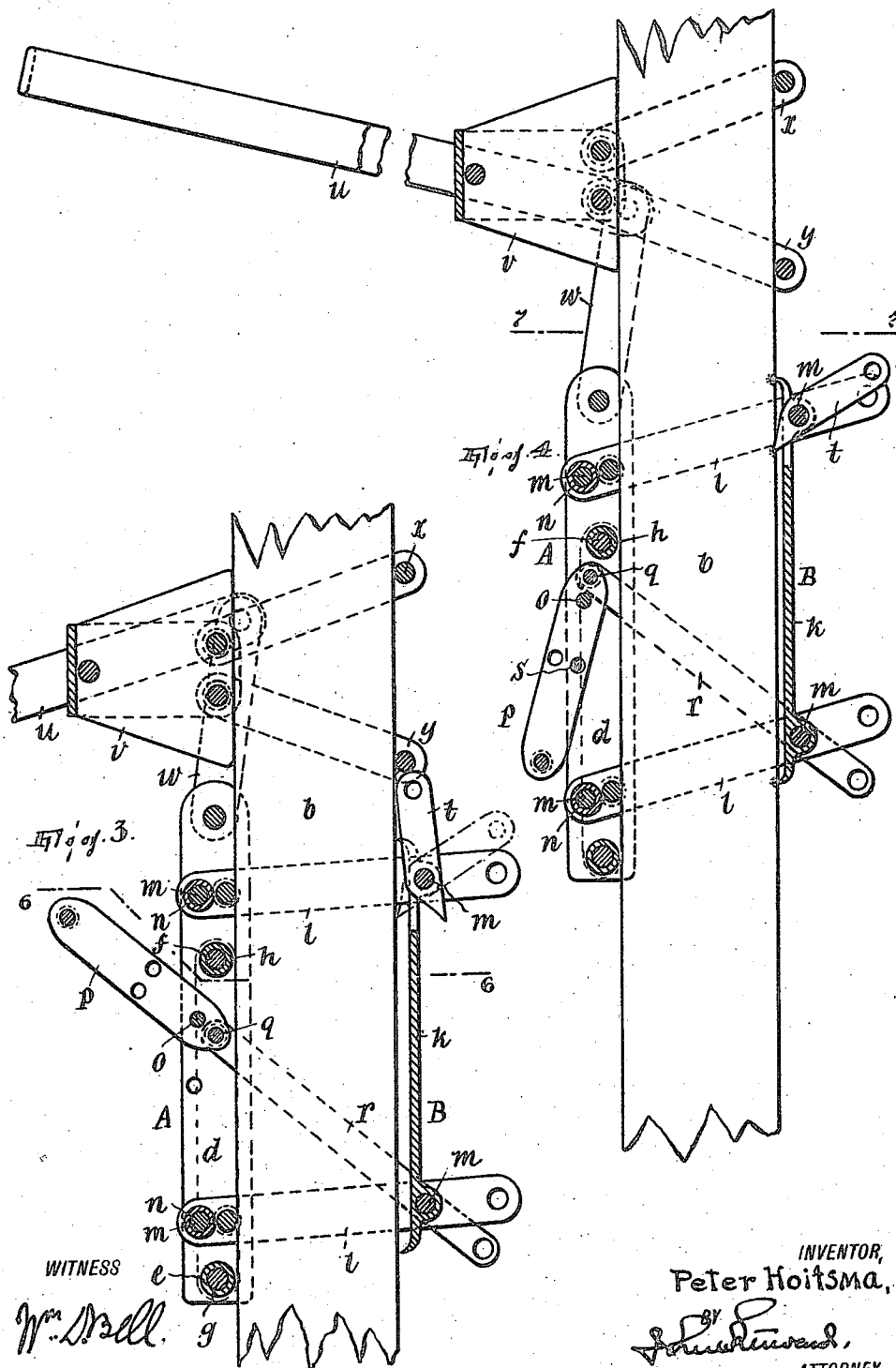
3 SHEETS—SHEET 1.



APPLICATION FILED FEB. 14, 1921.

Patented May 16, 1922.

3 SHEETS--SHEET 2.



INVENTOR,
Peter Hoitsma.

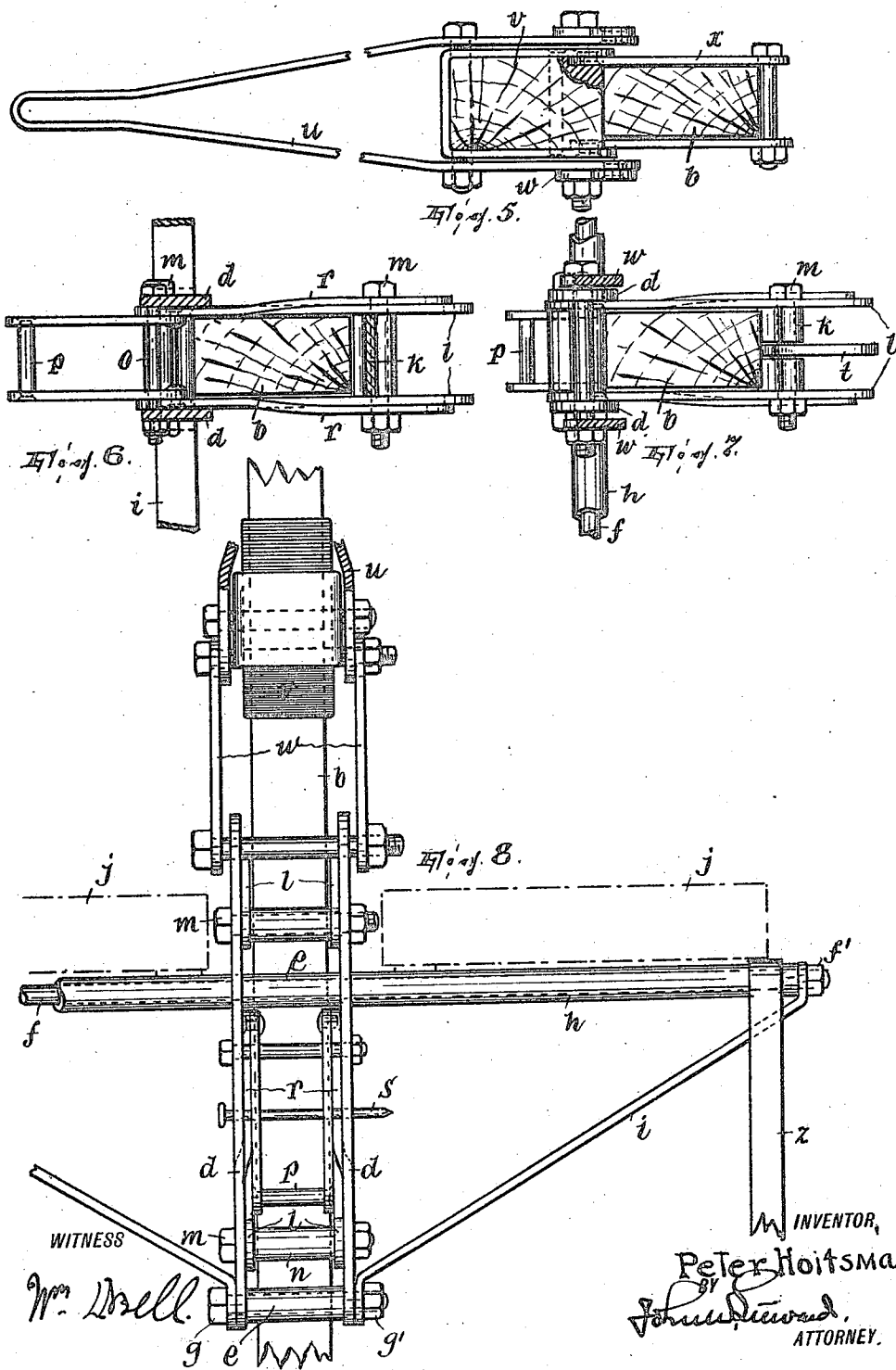
BY *[Signature]*
ATTORNEY

P. HOITSMA.
 SCAFFOLD MACHINE.
 APPLICATION FILED FEB. 14, 1921.

1,416,296.

Patented May 16, 1922.

3 SHEETS—SHEET 3.



UNITED STATES PATENT OFFICE.

PETER HOITSMA, OF PATERSON, NEW JERSEY.

SCAFFOLD MACHINE.

1,416,296.

Specification of Letters Patent.

Patented May 16, 1922.

Application filed February 14, 1921. Serial No. 444,650.

To all whom it may concern:

Be it known that I, PETER HOITSMA, a citizen of the United States, residing at Paterson, in the county of Passaic and State of New Jersey, have invented certain new and useful Improvements in Scaffold Machines, of which the following is a specification.

This invention relates to scaffolding apparatus, and particularly to apparatus whereby, given suitable uprights spaced apart and from the front of a building or the like, the workers on the scaffold can from time to time raise or lower the platform on which they work, on said uprights as supports without leaving the platform. According to my invention, there will be two climbing and supporting means or machines on the respective supports, the two machines being practically alike and together supporting the planking or equivalent platform, the invention consisting in the novel construction and arrangement of the parts of such a machine whereby the operations of raising and lowering can be easily and readily accomplished, the elements of safety and reliability are assured, and the machine is simple and inexpensive.

Figure 1 in the accompanying drawings shows a scaffold apparatus in front elevation embodying my invention;

Figure 2 is a side elevation;

Figure 3 is a vertical sectional view of one of the machines in place on its upright, the parts being in the positions they occupy at a time when the machine is undergoing lifting;

Figure 4 is a view similar to Figure 3, but showing the parts in the position they occupy when the machine grips the upright and is stationary;

Figure 5 is a plan view of the machine, partly in section, omitting the means thereof for supporting the platform;

Figures 6 and 7 are sectional views on the lines 6—6 and 7—7, respectively, of Figures 3 and 4;

Figure 8 is a side elevation, partly in section, and on a larger scale than Figure 2; and

Figure 9 shows in plan a brace for the uprights.

a in Figure 2 designates the front of a building, and *b* spaced uprights which will rest on the ground and will preferably consist of wooden lengths (as 2x4s) and will

further be progressively extended upward to any desired height by lap-jointing or otherwise joining the ends of said lengths, the uprights being secured to the building at successive elevations by braces, such as *c*, shown in Figures 1, 2 and 9; it will be understood that when in climbing with the use of my apparatus a machine is to pass a brace *c* above it, upon the machine having nearly reached said brace another such brace will be first arranged immediately below the machine to permit the removal of the first brace.

Two shoe structures, adapted to bear against opposite sides of each upright *b* and pivotally connected by linking means, are provided, one being adapted to assume the downward pressure of the planking or other platform and the other to grip the upright, their coaction to insure the grip being due to the linking means. These shoe structures are generally designated by the characters A and B. The shoe structure A consists of two vertical plates *d*; sleeves *e* spacing them at top and bottom; a long bar *f* extending through the plates and the upper sleeve; a bolt *g* having a nut *g'* and penetrating the plates and the lower sleeve; sleeves *h* on the free or projecting ends of the bars *f*; nuts *f'* on the ends of the bar; and braces *i* connecting the bolt *g* and bar *f* (being penetrated by them), the nuts *g'* and *f'* being adapted to be screwed up to clamp the several parts mentioned tight and form a rigid structure; otherwise stated, each shoe A has opposite projecting brackets (formed by *f*, *h*, *i*), and on these the ends of the planking *j* to form the platform (or rather two platforms, one inward and the other outward of the uprights *b*) is supported. The other shoe B is a plate *k* which preferably has each end sharpened so as to grip the wood of the upright. The linking means in the present case includes two parallel pairs of links *l* pivoted on bolts *m* in the plates *d* of shoe A and the plate *k* of shoe B, being properly spaced by sleeves *n* on the one hand and the plate *k* on the other. It will be seen that the parts A, B, *l* form a parallel lever system where, as in the present case, there are two, upper and lower, linking means, which is the preferred construction; and in this the preferred construction I find it best to allow collapsing movement of the lever system only in that way which involves movement of shoe A downwardly or shoe B upwardly, and not in the opposite direction (the reason for

which will appear later), and to that end I
 fulcrum on a bolt *o* in shoe A a lever *p* which
 is substantially U-shaped in side elevation
 (Figure 8) and has a long operating arm
 5 and a short power-arm, the latter being
 pivoted at *q* to a linking means, here formed
 by two links *r*, which is in turn connected
 with a suitable pivot, as *m*, on shoe B, so
 that the lever system is capable of collapsing
 10 movement only in such way that A can move
 relatively downward and B relatively upward:
 compare Figure 3, showing points *o*,
q and *m* alined, so that the collapse can take
 place only as just stated, with Figure 4,
 15 showing lever *p* swung downward and the
 lever system collapsed and thus gripping the
 upright. For holding lever *p* in the position
 shown in Figure 4 I provide it and shoe
 A with holes adapted to receive a pin *s*, as
 20 an ordinary nail; it will be observed that the
 members *p r* afford means for exerting collapsing
 pressure on the lever system so as
 to cause the shoes to grip the upright, the
 grip thus additionally obtained being maintained
 25 upon inserting the pin *s* in lever *p*
 and shoe A.

Shoe B is equipped with a pivoted dog *t*
 having a long outer arm and a short inner
 arm, the latter being pointed and reaching
 30 downward and adapted to bear against the
 upright and catch therein.

Once the shoe B obtains a grip on the upright,
 as by its points catching in the same, the grip
 is perfected by the weight of shoe A and the load
 it carries, the effect being to collapse the lever
 35 system and increase the pressure of B (and consequently
 the hold which its points obtain) on the upright,
 as well as the frictional pressure of A thereon.
 40 The pressure thus obtained, if desired, for the
 sake of additional safety, can be increased as
 explained by forcing and locking down lever *p*.

Each machine includes a lifting means
 45 connected with its lever system and adapted to
 assume a shifting purchase on the upright. To
 this end *u* is a lever that is fulcrumed in a
 block *v* and is connected with the shoe A by
 links *w*, the block being adapted to bear
 50 against a face of the upright. Pivoted to the
 block one above the other are two shackles
x and *y*, each being substantially U-shaped in
 plan and straddling the upright. When the
 operator elevates the handle or free end of the
 55 lever *u* the result is to shift the block *v*
 upwardly along the upright, link *w* acting as
 a fulcrum; the shackles are at this time kept
 from binding on the upright by the operator's
 60 hand. When the lever is now to be depressed
 to effect the lifting, shackle *x* is raised to
 bind against the upright and prevent the block
 tilting on its lower corner. Sometimes in
 descending with the machine the gripping
 65 means may catch on an obstruction on the

upright (as a nail left therein), so that power
 would have to be applied to the lever to overcome
 the obstruction and positively force down the
 gripping means (which, as will appear, is then
 rendered ineffective to 70 grip); at this time
 shackle *y* is allowed to fall and so by purchase
 obtained on the upright keep the block from
 tilting on its upper right-hand corner.

The gripper formed by shoes A and B is 75
 one which grips the upright under load but
 moves freely upward on the upright when lifted.
 That is, once shoe B obtains an effective hold
 the pressure of the load on shoe A results in the
 shoes coacting to exert clamping 80 pressure on
 the upright. The initial grip of B on the upright
 when A is free of the lifting force is rendered
 certain by the dog *t*, which bites or catches in
 the upright however far B may perchance be
 85 spaced from the upright.

When the lifting means comprising lever
u and its adjuncts is operated (*p* being
 unlocked) each lifting movement thereof obviously
 results in opening or releasing movement of the
 gripper or gripping means; the pivot *o* being
 outward of a vertical line through *q*, shoe A
 is shifted upwardly relatively to shoe B, lever
p swinging to the position of Figure 3 and shoe
 B being prevented 95 from movement downward
 past its position there shown by *p-r*. When the
 new position of the gripper has been attained the
 gripper assumes a fresh grip.

Dog *t* is not indispensable, but it insures 100
 certainty and also promptness of the gripping
 action once the weight of shoe A and its load
 is free to act.

If the dog be held in inactive position and
 lever *p* held up (Figure 3) the gripper 105
 is ineffective to clamp the upright. For descending,
 therefore, the operator can utilize the lifting
 means to controllably lower the gripper step
 by step, lever *p* being held up during each
 downward movement and at the 110 end thereof
 pressed downward to cause the clamping of the
 upright until a fresh purchase can be taken on
 the upright by the lifter for the next downward
 movement; or dog *t* and said lever can simply
 115 be allowed to fall to cause the new purchase.

A pair of slings *z* can be suspended from the
 projecting brackets of the two machines to
 support a cross-piece 2, the cross-pieces serving
 to support material 3 used in the 120 building construction.

Having thus fully described my invention,
 what I claim is:—

1. A scaffold machine adapted to be shifted
 vertically on a suitable upright and including
 125 a load-carrying member adapted to bear against
 one face of the upright, a gripping member
 adapted to grip the opposite face of the upright,
 and linking means extending from one member
 across the upright 130

to the other member and pivotally connecting said members.

2. A scaffold machine adapted to be shifted vertically on a suitable upright and including a load-carrying member adapted to bear against one face of the upright, a gripping member adapted to grip the opposite face of the upright, linking means extending from one member across the upright to the other member and pivotally connecting said members, and means to move one of said members toward and from the other.

3. A scaffold machine adapted to be shifted vertically on a suitable upright including a gripping member adapted to grip one face of the upright, a load-carrying member adapted to bear against an opposite face of the upright at a point opposite the gripping member, and means, connecting said members, to move one toward and from the other.

4. A scaffold machine adapted to be shifted vertically on a suitable upright including a gripping member adapted to grip one face of the upright, a load-carrying member adapted to bear against an opposite face of the upright at a point opposite the gripping member, and a lever and a link pivoted one to one member and the other to the other and also pivotally connected together.

5. A scaffold machine adapted to be shifted vertically on a suitable upright and including a load-carrying member adapted to bear against one face of the upright, a gripping member adapted to grip the opposite face of the upright, linking means extending from one member across the upright to the other member and pivotally connecting said members, and means to move one of said members toward and from the other including a lever pivoted to one member and operatively connected to the other.

6. A scaffold machine adapted to be shifted vertically on a suitable upright and including a load-carrying member adapted to bear against one face of the upright, a gripping member adapted to grip the opposite face of the upright, linking means extending from one member across the upright to the other member and pivotally connecting said members, and means, connecting said members, to limit the downward movement of the gripping member relatively to the other member.

7. A scaffold machine adapted to be shifted vertically on a suitable upright and including a load-carrying member adapted to bear

against one face of the upright, a gripping member adapted to grip the opposite face of the upright, linking means extending from one member across the upright to the other member and pivotally connecting said members, and a lifting means operatively connected with the load-carrying member and having vertically shiftable means to grip the upright.

8. In a climbing scaffold apparatus, the combination of a gripping means including a gripping member adapted to grip one face of the upright to be climbed and a load-carrying member coupled with the gripping member for up and down movement relatively thereto and away from and also against an opposite face of the upright, and a lifting means including a lever operatively connected with the load-carrying member and a fulcrum-support for the lever shiftable on and adapted to grip the upright.

9. A scaffold machine adapted to be shifted vertically on a suitable upright and including a load-carrying member adapted to bear against one face of the upright, a gripping member adapted to grip the opposite face of the upright, linking means extending from one member across the upright to the other member and pivotally connecting said members, and a lifting means adapted to be operatively connected with the upright and having lifting connection with the load-carrying member.

10. In a climbing apparatus, the combination of a gripping means adapted to grip and thereby secure itself to the upright to be climbed on downward movement of said means but slidable upwardly free of said upright, and lifting means including a block to bear against a face of the upright, a shackle pivoted to the block and embracing and adapted to bear against the other face of the upright, a lever fulcrumed in the block and a link connecting the lever and lifting means.

11. In a scaffold machine, the combination, with a gripping system including members to grip opposite faces of the uprights to be climbed and arranged opposite each other and a linking member pivotally connecting them, of means, connecting two of said members, to move the first two members toward and from each other.

In testimony whereof I affix my signature.

PETER HOITSMA.