

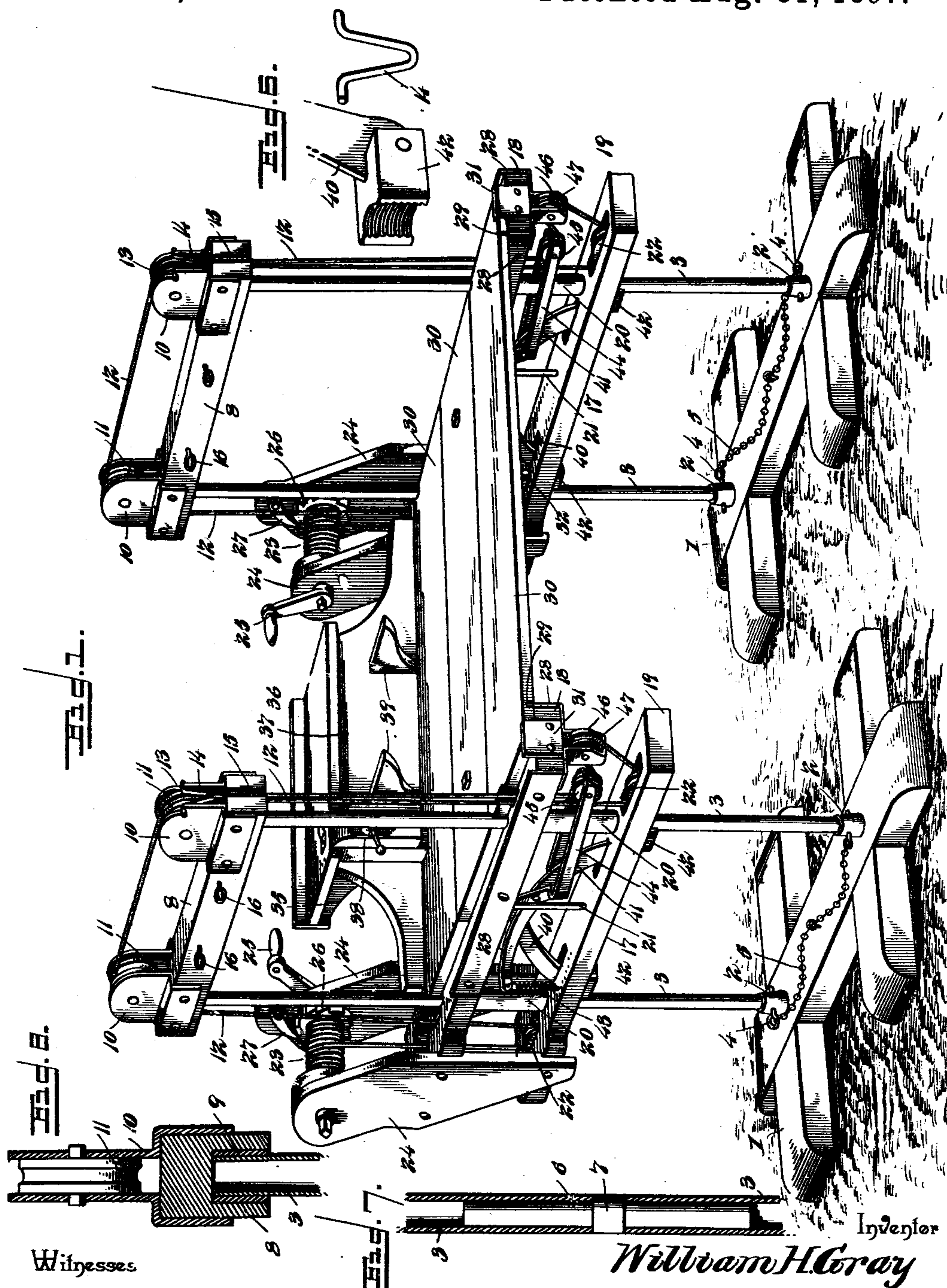
(No Model.)

2 Sheets—Sheet 1.

W. H. GRAY.  
SCAFFOLD.

No. 588,982.

Patented Aug. 31, 1897.



Witnesses

*E. H. Stewart*  
*R. W. Smith*

By his Attorneys,

*C. A. Snow & Co.*

Inventor

*William H. Gray*

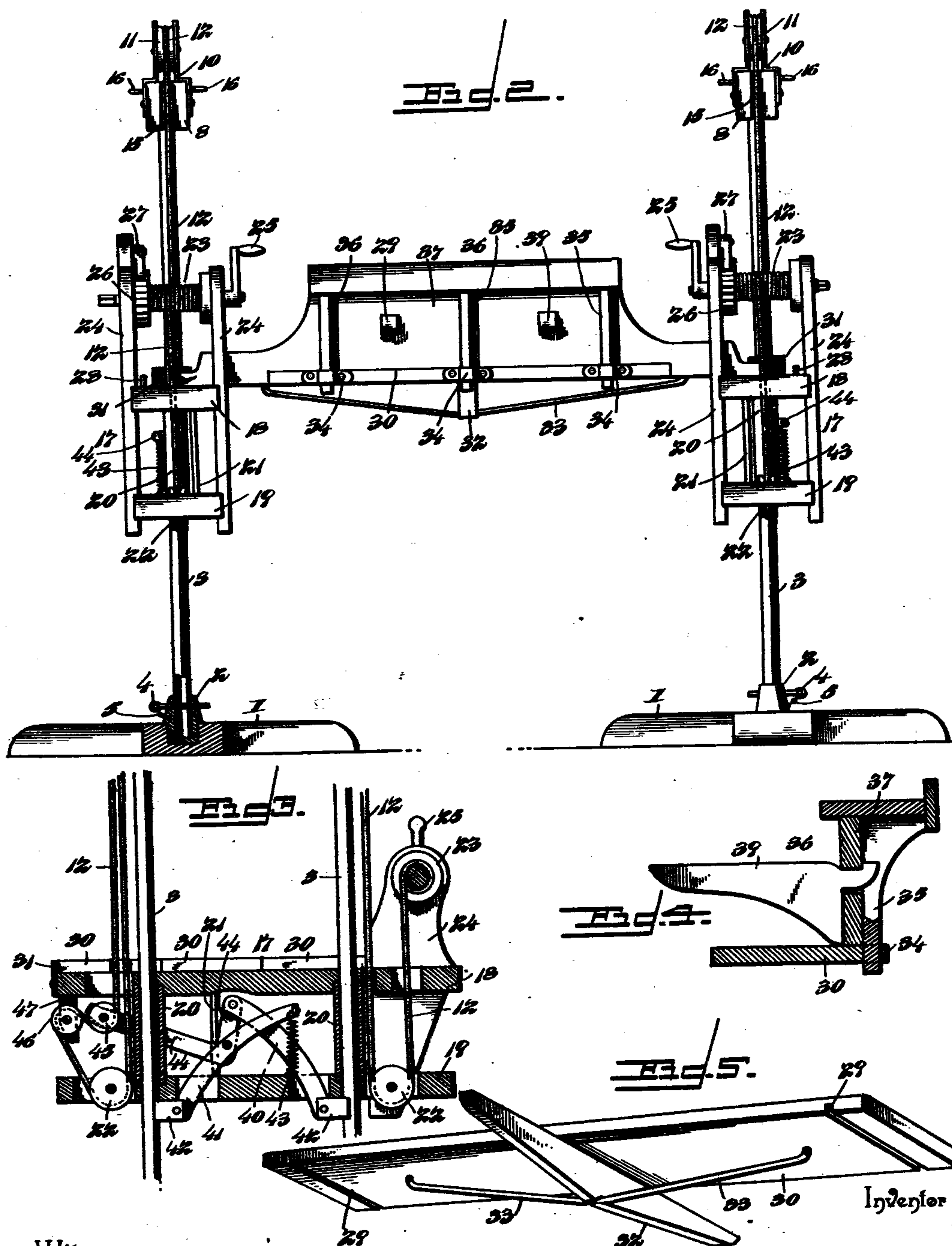
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# UNITED STATES PATENT OFFICE.

WILLIAM H. GRAY, OF FALCONER, NEW YORK.

## SCAFFOLD.

SPECIFICATION forming part of Letters Patent No. 588,982, dated August 31, 1897.

Application filed March 31, 1897. Serial No. 630,171. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM H. GRAY, a citizen of the United States, residing at Falconer, in the county of Chautauqua and State of New York, have invented a new and useful Scaffold, of which the following is a specification.

This invention relates to an improvement in scaffolds, and has for its object to provide an improved construction of scaffold which may be knocked down when not in use and stored compactly and which may be easily and quickly set up and placed in position for use when needed.

One of the principal objects of the invention is to provide, in connection with the movable scaffold-bed, an improved construction of brake or safety appliance which in the event of the breakage of one of the hoisting or supporting ropes would operate automatically, in conjunction with the standards or uprights of the device, to arrest the downward progress of the scaffold-bed and prevent serious accident which would otherwise occur. These and other objects of the invention will appear more fully in the ensuing description.

The invention consists in certain novel features and details of construction and arrangement of parts, as hereinafter fully described, illustrated in the drawings, and finally pointed out in the claims.

In the accompanying drawings, Figure 1 is a perspective view of the improved scaffold, looking from the inner side or the side next adjacent to a building when in position. Fig. 2 is a view in elevation looking from the opposite side. Fig. 3 is a vertical transverse section taken in line with the tubular uprights of one of the end supports. Fig. 4 is an irregular detail section through one of the stage-planks and detachable work-bench, showing the manner of attaching the latter. Fig. 5 is a reverse perspective view of the intermediate stage-plank. Fig. 6 illustrates one of the brake-shoes and one of the grapple-hooks in detail. Fig. 7 is a detail sectional view showing the extension-plug and the manner of coupling together adjacent sections of an upright. Fig. 8 is a detail section through the top cross-bar and upper end of one of the tubular uprights.

Similar numerals of reference designate

corresponding parts in the several figures of the drawings.

The present invention contemplates the use of two separate and independent end supports which are for the sake of cheapness of manufacture and uniformity the counterpart of each other, so that it will be necessary to describe but one of them. Each of these supports comprises a suitable base 1, consisting of suitable crossed arms disposed at right angles to each other for the purpose of giving sufficient breadth to the base. Malleable-iron sockets 2 are mounted in the base 1, being spaced a suitable distance apart and adapted to receive the lower extremities of a pair of standards or uprights 3. These standards or uprights are tubular, being made preferably from malleable-iron pipes, and their lower ends, which are received in the sockets 2, are perforated in alinement with other perforations in the sockets 2 to receive stay-pins 4, removably inserted therein and anchored to the base by suitable chains or flexible connections 5.

The tubular uprights 3 may be made of any desired length, and, if desired, similar extension-uprights may be applied to the upper extremities thereof by means of suitable plugs 6. These plugs each comprise a central enlargement or collar 7, which when the sections of the uprights are connected lies between the adjacent extremities of such sections, while the oppositely-projecting shanks of the plug enter the open ends of the sections and thus hold the same in the proper relative positions. By this means the tubular uprights may be extended to any desired height. At their upper ends the uprights 3 are connected by a horizontal cross-head 8, which is preferably formed of wood and has inserted in its lower surface metal thimbles or sockets 9, in which the upper ends of the uprights are received and which provides for detaching the cross-head when taking down the scaffold.

Arranged above the cross-head 8 and secured thereto adjacent to each end are metal brackets 10, arranged in pairs and spaced apart and forming the bearings in which are journaled grooved pulleys 11, over which runs the hoisting-rope 12. One pair of brackets, that pair next to the building, is formed with opposing notches 13, in which are received



the hooked terminals of a V-shaped grapple 14, fast to one end of the hoisting-rope 12. The ends of the cross-head 8 are slotted, as at 15, for the passage of the rope 12, and also have secured to the opposite side faces thereof metal eyes 16 for the reception of suitable guy-ropes which may extend from one end support to the other and from each cross-head 8 to the ground or other convenient point of attachment for imparting the necessary end-wise rigidity to the scaffold.

17 designates the scaffold-bed, which comprises an upper cross-bar 18 and a lower cross-bar 19, the said bars being spaced apart by means of tubular guides or sleeves 20, seated at their extremities in recesses in the adjacent surfaces of said bars and surrounding the uprights 3. By this means the scaffold-bed is adapted to slide freely up and down upon the uprights and a broad bearing is afforded which imparts steadiness in operation. The upper and lower cross-bars of the scaffold-bed are held together centrally by a tie-bolt 21. The lower cross-bar 19 is slotted adjacent to its ends and outside of the uprights, and within these slots are journaled grooved pulleys 22, around which runs the hoisting-rope 12, one end of said rope being secured to the inner end of the cross-head 8, as above described, and the opposite end being wound around a windlass 23, mounted in suitable bearing-arms 24, arranged preferably at the outer end of the scaffold-bed and being of sufficient length to rigidly connect and brace the bars 18 and 19 and extend sufficiently above the former to receive the said windlass. The shaft of this windlass is extended through and beyond the arms in which it is journaled and has both of its ends squared for the reception of an operating hand-crank 25, which may thus be employed at either end of the windlass, as convenience may dictate.

The windlass has circumferential flanges adjacent to each end, one of which is provided with peripheral ratchet-teeth, as shown at 26, for engagement with a pivoted gravity-dog 27, mounted on one of the bearing-arms, as shown. This arrangement, of course, prevents the unwinding of the rope and holds the stage elevated until the dog is thrown out of engagement. The hoisting-rope 12 works through openings at the proper points in the upper cross-bar 18 of the scaffold-bed.

The upper cross-bars 18 of each end support have secured to their inner and outer edges metal plates 28, the purpose of which is to engage suitable kerfs or grooves 29 in the end portions of the several boards 30, which comprise the movable stage. The location of these grooves or kerfs with relation to the stage-boards is illustrated in Fig. 5, and it will be noted in the perspective view, Fig. 1, that the extremities of the planks reach only to the centers of the cross-bars 18. The object of this is to allow a third or a fourth end support to be utilized where found necessary and the stage-boards to be brought together

end to end to form a continuous platform. The outer board extends at its outer edge in close proximity to the arms 24, while the inner board is held from sliding off the inner ends of the bars 18 by means of metal stops or plates 31, as shown. The intermediate stage-board has secured to its lower surface a transverse cleat 32, which extends at its opposite ends beyond the side edges of said board, so as to underlie the other boards upon each side thereof, and thus prevent the uneven sagging of the boards. This sagging of the middle board, as well as the other boards, is to a great extent prevented by means of a truss-rod 33, which passes under the cleat 32 and is secured at its ends to the end portions of the intermediate board of the stage.

To the outer edge of the outer board are attached a series of metal sockets 34, which are adapted to receive the lower ends of the legs 35 of a work-bench. (Indicated at 36.) This work-bench comprises, essentially, a top or table and an upright support 37, and the work-bench may be equipped with a vise 38 and with saw-horses 39, detachably connected thereto, and may be otherwise fitted out to add to the convenience of the workmen.

In order to prevent the descent of the stage upon the breaking of the hoisting-rope of either end support, a brake mechanism is provided for each of said supports. This brake mechanism comprises a pair of brake-levers 40 and 41 of segmental form and pivotally mounted adjacent to their lower ends in slots in the lower cross-bar 19 of the stage-bed. To the lower extremities of these brake-levers are attached shoes 42, having concaved working faces which are also toothed or serrated to insure their firm engagement with the tubular uprights 3.

The curved upper ends of the brake-levers are crossed, as shown, and between the extremity of one of the levers 41 and the cross-bar 19 is interposed a coiled spring 43, which exerts its tension to hold the brake-shoe of its lever against its respective upright. The other lever 40 is connected pivotally to the short arm of an elbow-lever 44, and said elbow-lever connects pivotally at its elbow to the brake-lever 41, while the long arm of the elbow-lever is bifurcated to stride the inner sleeve 20, above referred to, inside of which it carries a grooved pulley 45. The hoisting-rope 12 extends downward from its point of attachment to the upper cross-head and passes first around the last-named pulley 45. It then passes upward over another pulley 46, mounted in a stationary bracket 47, secured to the underside of the cross-bar 18, and then passes under the pulley at the inner end of the lower cross-bar 19, and thence directly upward over the pulleys of the cross-head, then downward under the pulley at the outer end of the bar 19, and thence upward to the windlass. It will thus be seen that the coiled spring 43 holds the brake-shoes in operative engagement with the uprights, as the lever



41 will through its connection with the lever 40 serve to hold the brake-shoe of the latter lever against its upright. When, however, the hoisting-rope is under tension, it will be seen that the pulley 45, at the swinging end of the elbow-lever 44, will be lifted by such rope, and under such a disposition of the elbow-lever the brake-levers will be vibrated so as to withdraw their shoes from engagement with the uprights, thus allowing the stage-bed to be moved freely up and down by the workman standing at that end of the stage and having the windlass under control.

From the foregoing description it will be seen that a very strong, durable, and reliable scaffold is obtained and that the same is rendered particularly safe by reason of the brake mechanism above described, which, as has been shown, will operate automatically and be thrown into immediate action upon the parting of the hoisting-rope at any point.

It will also be apparent that the various parts of the scaffold may be easily and quickly disassociated and that when the scaffold is knocked down the various parts thereof may be stored compactly, or they will admit of ready transportation to and from the point of operation.

The scaffold is highly useful and convenient to all classes of workmen and laborers engaged in the construction of buildings, and matters may be greatly expedited by lowering the stage to the ground, loading the building materials thereon, and then by means of the hoisting mechanism carrying the stage to the required elevation.

The construction described is very light and portable and at the same time very strong and well braced.

Changes in the form, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

Having thus described the invention, what is claimed as new is—

1. The combination of a suitable base, uprights mounted thereon and arranged in pairs, cross-heads connecting the upper ends of the uprights of each pair, a vertically-movable stage-bed guided by the uprights, hoisting mechanism suspending the stage-bed from the cross-heads, and the automatically-operating brake mechanism carried by the stage-bed and arranged to engage the uprights, said brake mechanism being held out of engagement with the uprights by the tension of the hoisting-ropes, substantially as and for the purpose described.

2. The combination with a suitable base, and uprights mounted thereon, of a movable stage-bed, hoisting mechanism carried thereby, and a brake mechanism comprising a pair of brake-levers having shoes and pivotally connected to the bed and to each other, a spring for throwing the brake-shoes against the uprights, and an arm or lever connected

to the brake-levers and also having a sliding engagement with the hoisting-rope whereby the latter when under tension will hold the brake-shoes out of engagement with the uprights, while the breaking of the same will allow the brake-shoes to act through the assistance of the aforesaid spring, substantially as described.

3. The combination with a suitable base and uprights mounted thereon, of a vertically-movable stage-bed mounted thereon, hoisting mechanism whereby the bed may be raised and lowered, and a safety appliance carried by the bed and comprising a pair of brake-levers having pivotal connection with the bed and carrying brake-shoes which work against the uprights, a spring connecting one of said levers with the bed and operating to hold the shoe of said lever against its respective upright, an elbow-lever having pivotal connection with both of said brake-levers and carrying a pulley at the swinging extremity of one of its arms, and a hoisting-rope passing around said pulley and over other pulleys carried by the bed, the arrangement being such that the tension of the rope holds the brake-shoes out of action while upon the parting of the rope, the shoes are thrown into action through the assistance of said spring, substantially as described.

4. The combination with a suitable base having a socket, of a tubular upright having its lower end seated in said socket and made in two or more sections, and a coupling-piece having shank or plug portions which enter the open ends of the tubular sections and also having intermediate its ends an annular enlargement or collar which lies between the adjacent ends of the tubular sections, substantially as and for the purpose described.

5. The combination with a suitable base having sockets, of tubular uprights having their lower ends in said sockets, a cross-head removably fitted upon and connecting the upper ends of the uprights and carrying at its ends brackets in which the pulleys are mounted, one of said brackets being formed with oppositely-disposed notches, and a hoisting-rope having attached to its end a V-shaped grapple the terminal portions of which are hooked to engage the aforesaid notches, substantially as described.

6. The combination with a pair of end supports having vertically-movable stage-beds mounted thereon, each bed comprising a horizontal cross-bar connecting the uprights of such end supports and having plates attached to its opposite side edges and projecting above the upper surface thereof, of a stage comprising one or more boards formed adjacent to their ends with grooves or kerfs in the under surfaces thereof, the said grooves or kerfs being adapted to receive the upper edges of said plates on the bed-pieces, substantially as and for the purpose described.

7. The combination with a stage-board provided at one edge with sockets, of a detach-



able work-bench mounted on the stage-board  
and projecting outward beyond the same,  
said bench being provided at its outer side  
with depending legs fitting in said sockets,  
5 and the saw-horses extending from the inner  
side of the bench and detachably mounted  
thereon, substantially as described.

In testimony that I claim the foregoing as  
my own I have hereto affixed my signature in  
the presence of two witnesses.

WILLIAM H. GRAY.

Witnesses:

PHILO RIDER,  
DANIEL SPEESE.