July 18, 1933. H. S. GEER 1,919,016

SCAFFOLDING

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Fig. 1.

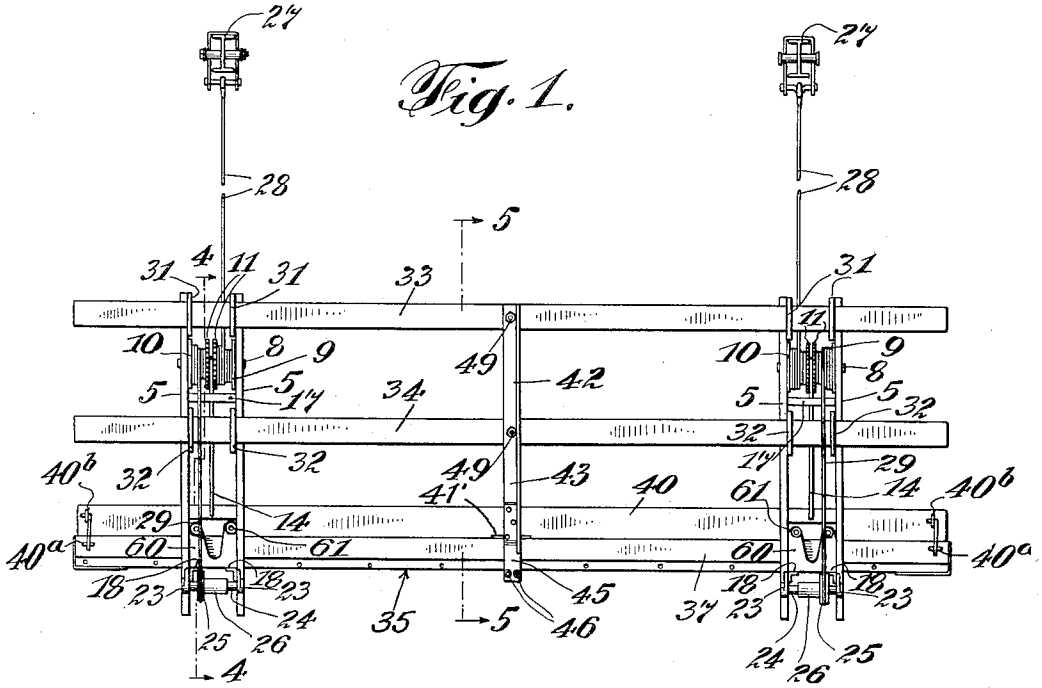


Fig. 2.

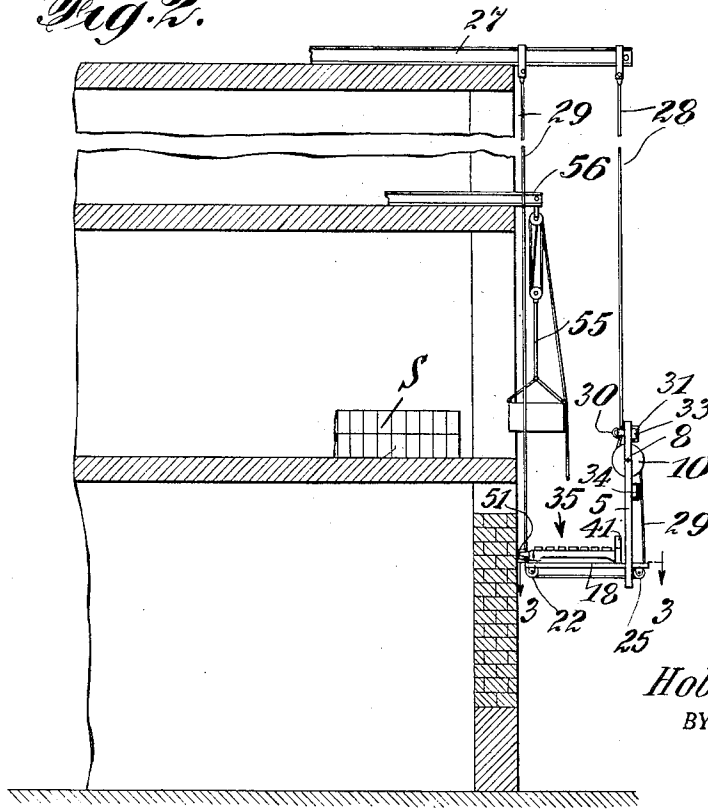
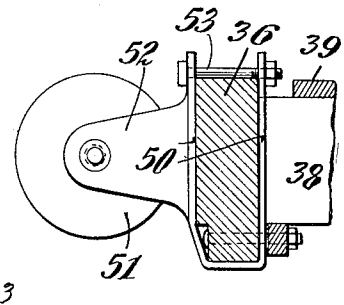


Fig. 9.



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Fig. 3.

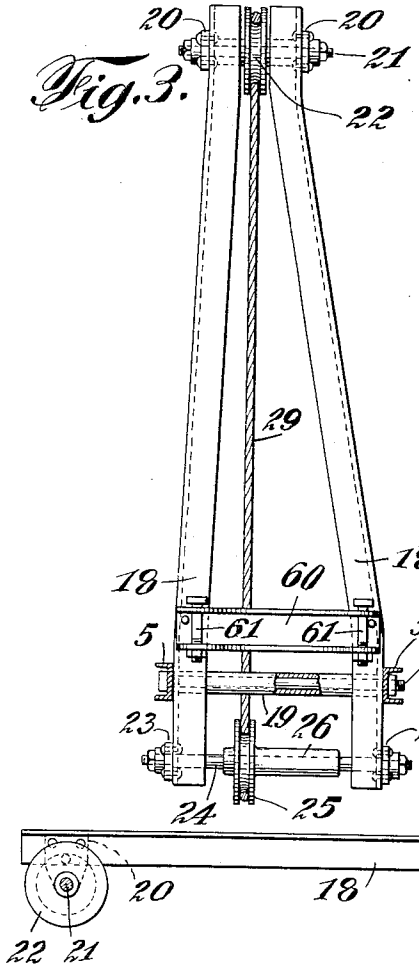


Fig. 4.

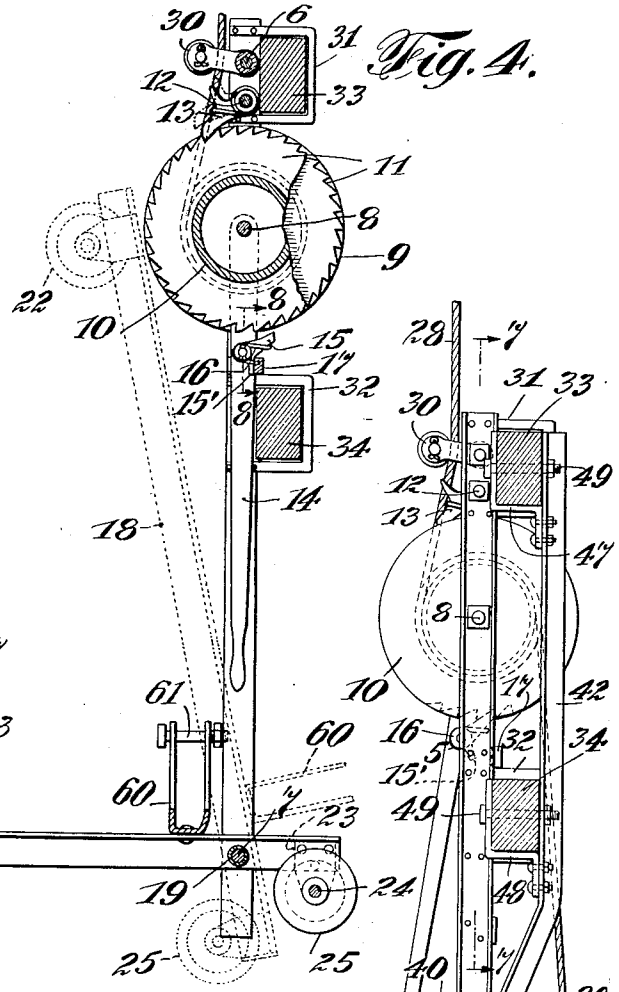


Fig. 5.

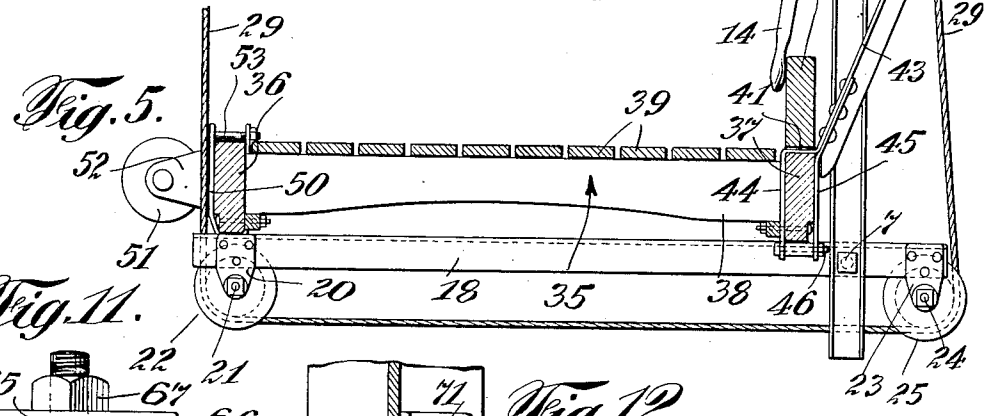
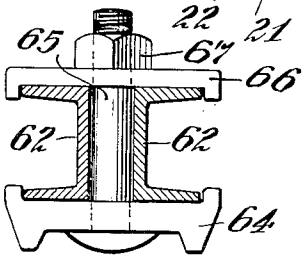


Fig. 11.



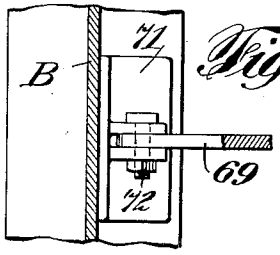


Fig. 12.

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SCAFFOLDING

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Fig. 6.

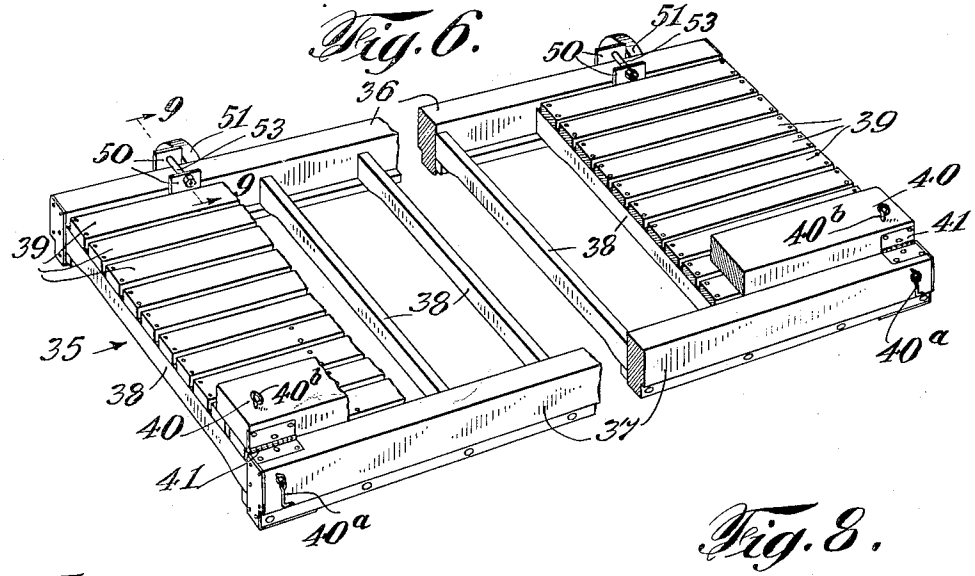


Fig. 8.

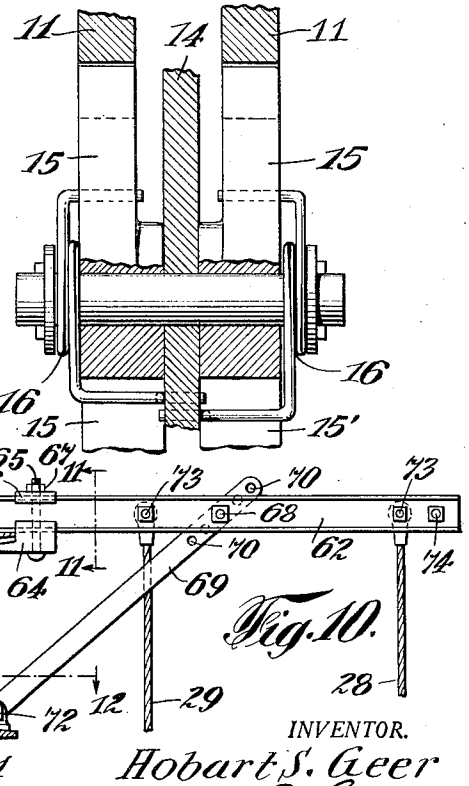


Fig. 7.

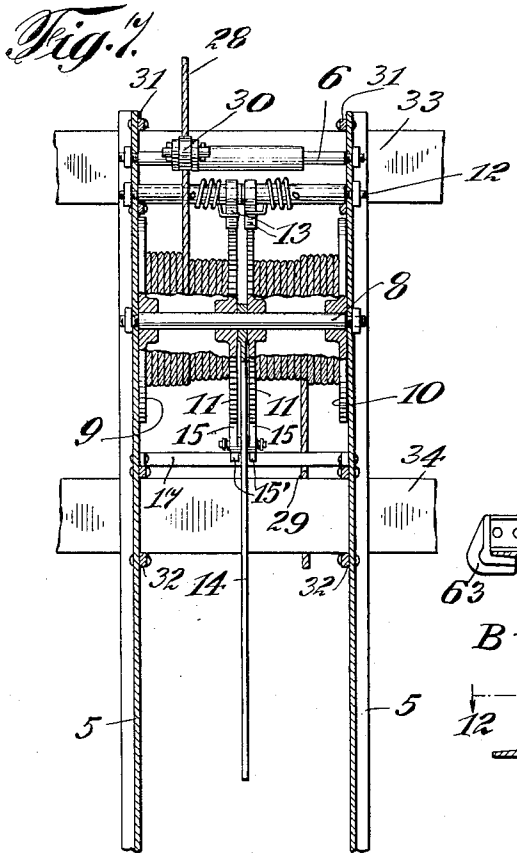


Fig. 10.

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UNITED STATES PATENT OFFICE

HOBART S. GEER, OF CORONA, NEW YORK, ASSIGNOR TO AMERICAN SAFETY DEVICE CO., OF NEW YORK, N. Y., A CORPORATION OF NEW YORK

SCAFFOLDING

Application filed March 21, 1931. Serial No. 524,240.

This invention relates to scaffolding, and more particularly to apparatus of this kind possessing certain novel and important advantages whereby the placement or setting of large heavy stone blocks in building walls may be materially facilitated, and the manual labor incident thereto reduced to a minimum.

It is the primary object and purpose of my present invention to provide such a scaffolding of the suspended adjustable type having hoisting devices with which the suspension means is connected so located or arranged that the said devices will not in any way interfere with or obstruct the movements of the stone masons on the scaffold in the setting of the stone blocks.

It is another important object of the invention to provide a scaffold structure of the above type, the primary parts of which, while maintained in permanently connected relation, may be relatively folded and together with the scaffold platform compactly arranged so as to occupy a minimum of space in storage or transportation.

More particularly, in a practical embodiment of the invention, I provide spaced upright frames in each of which a hoisting device is mounted, and platform supporting frames pivotally connected with said upright frames for swinging movement relative thereto, together with a platform adapted to be arranged upon said horizontal frames and means for removably retaining said platform against shifting movement relative to said pivotally connected frames.

It is also another feature of my invention to provide each of the hoisting devices with a pair of independently rotatable drums and a common operating lever therefor carrying separately releasably dogs or pawls coacting with ratchets on the adjacent ends of said drums, together with additional pawls engaging said ratchets to prevent retrograde movement of the respective drums, and suspension cables, one of which extends downwardly adjacent to the building wall and around guide sheaves mounted on one of the horizontal frames and upwardly to one of the hoisting drums while the other of said cables at the outer side of the scaffold is wound upon the other hoisting drum. By means of the independently releasable operating dogs for the hoisting drums, it is possible to wind one of the suspension cables upon one drum independently of the other cable so as to properly level the scaffold platform.

It is also a further general object of my invention to provide scaffolding as above characterized, which is of relatively simple mechanical construction, exceedingly strong and durable, and in which adequate provision is made for the safety of the masons or workmen standing on the scaffold platform.

With the above and other objects in view, the invention consists in the improved scaffolding, and in the form, construction and relative arrangement of its several parts as will be hereinafter more fully described, illustrated in the accompanying drawings, and subsequently incorporated in the subjoined claims.

In the drawings, wherein I have disclosed one practical and satisfactory embodiment of my present invention, and in which similar reference characters designate corresponding parts throughout the several views,—

Figure 1 is an outer side elevation of a scaffold structure embodying my present improvements;

Fig. 2 is an end elevation thereof showing the manner of suspending the scaffold with respect to the face of the building wall;

Fig. 3 is an enlarged horizontal sectional view taken on the line 3—3 of Fig. 2;

Fig. 4 is an enlarged vertical sectional view taken on the line 4—4 of Fig. 1;

Fig. 5 is a transverse vertical sectional view taken on the line 5—5 of Fig. 1;

Fig. 6 is a detail fragmentary perspective view of the scaffold platform;

Fig. 7 is a vertical sectional view taken on the line 7—7 of Fig. 5;

Fig. 8 is an enlarged detail sectional view taken on the line 8—8 of Fig. 4;

Fig. 9 is a detail vertical section taken on the line 9—9 of Fig. 6;

Fig. 10 is a detail side elevation showing

a preferred means for anchoring the scaffold suspending cables at their upper ends to a part of the building;

Fig. 11 is a detail transverse section taken on the line 11—11 of Fig. 10, and

Fig. 12 is a detail horizontal section taken on the line 12—12 of Fig. 10.

In carrying out my invention, the scaffold structure may be of any desired length and any number of suitably spaced hoisting devices may be provided therefor. However, it is usual to provide scaffolding units having a length of about 20 feet, as it is found that units of this length may be most conveniently and expeditiously assembled and manipulated or adjusted. For such 20 foot scaffold units, I provide two hoisting devices, each of which is located about two feet from one end of the scaffolding unit. Each hoisting device is mounted in an upright frame, and as herein shown, the said frame consists of suitably spaced parallel bars 5, preferably of channel form in cross section. These bars at their upper and lower ends are rigidly connected by the tie rods 6 and 7 respectively. Suitably spaced below the upper tie rod 6, the drum shaft or axis 8 is rigidly fixed at its opposite ends to the frame bars or uprights 5. Upon this axis, a pair of drums generally indicated at 9 and 10 respectively, are loosely or rotatably mounted. The inner opposed heads of these drums are peripherally formed with the ratchet teeth 11. Above the drums, a rod 12 is fixed at its ends to the spaced bars 5 and upon said rod a pair of spring held safety dogs or pawls 13 are loosely mounted at one of their ends for engagement with the ratchet teeth 11 of the respective drums to prevent rotation of said drums in a direction to unwind the cables therefrom.

An operating lever 14 extends between the drums 9 and 10 of each hoisting device and is loosely engaged upon the shaft or axis 8 thereof. This lever carries the pivoted pawls 15 yieldingly held in engagement with the ratchet teeth 11 of the respective drums by suitable springs 16 so that when the operating lever is moved in the upward direction, said pawls will ride idly over the teeth of the ratchets, and when said lever is forced downwardly, said pawls coacting with the ratchet teeth will effect the simultaneous rotation of said drums. Each of these pawls has a downwardly projecting finger 15′ which is adapted to engage a stop bar 17 rigidly fixed at its ends to the frame bars 5 to move said pawls to their released positions out of engagement with ratchet teeth 11.

Upon the lower tie rod 7, a platform supporting frame is mounted at one of its ends for pivotal or swinging movement. As herein shown, this frame consists of the two angle bars 18 having the corresponding ends thereof widely spaced apart to fit closely between the spaced frame bars 5. These ends of the bars 18 project in parallel relation beyond the vertical frame bars 5 and a suitable spacer sleeve indicated at 19 is arranged upon the tie rod 7 between the vertical flanges of the angle bars 18. The bars 18 extend in inwardly converging relation to each other from the frame bars 5 and at their other ends have the bearing brackets 20 fixed to and depending from the outer vertical side flanges of said bars to receive the shaft or axis 21 upon which a cable pulley or sheave 22 is loosely mounted. Similar bearing brackets 23 are also secured to the opposite ends of the bars 18 to receive the ends of the shaft 24 upon which the cable sheave or pulley 25 is loosely mounted. This pulley is provided with a tubular hub extension 26 at one side thereof for contact with one of the frame bars 18. This pulley is however, capable of sufficient axial shifting movement along the shaft 24 so as to prevent adjacent convolutions of the cable piling upon each other as the cable is wound on the drum.

At the top of the building, a suitable rigidly fixed overhanging beam or outrigger indicated at 27 is provided to which the inner and outer suspension cables 28 and 29 respectively, are suitably connected at their upper ends. Each inner suspension cable 28 is connected to and adapted to be wound upon the drum 10 of one of the hoisting devices, said cable extending downwardly around a guide sheave 30 loosely mounted upon the upper tie rod 6 connecting the frame bars 5 to the inner side of said drum.

Each outer suspension cable 29 which extends downwardly from the outrigger 27 closely adjacent to the front face of the building and thence transversely beneath the horizontal frame members 18 in engagement with the peripherally grooved pulleys 22 and 25, extends upwardly from the latter pulley to the outer side of the drum 9 of the hoisting device to be wound upon the latter drum.

The frame bars 5 for each of the hoisting devices are provided above and below the drums 9 and 10 with the outwardly projecting retaining and supporting loops 31 and 32 respectively, for the longitudinally extending removable guard rails 33 and 34, the said guard rails being preferably of wood, and each provided intermediate of its ends with a bolt receiving opening therethrough.

The numeral 35 designates a removable platform to extend the entire length of the scaffold section or unit and embodying suitably spaced inner and outer side rails 36 and 37 respectively, connected at spaced points by the transverse beams 38 to which the longitudinally extending spaced planks or floor boards 39 are nailed or otherwise permanently and securely fixed. Preferably, I provide a longitudinaly extending toe board 40 hingedly connected to the upper edge of the outer platform rail 37 as shown at 41 and

which when disposed in the vertical plane of said rail as shown in Fig. 5 of the drawings, provides an additional safety means for the workmen and also prevents building material being accidentally knocked from the platform at the outer side of the scaffold. The toe board 40 may be releasably held in the upright position shown in Fig. 5 of the drawings by any suitable releasable fastening means, such for instance, as the hooks 40^a attached to the opposite ends of the side rails 37 for engagement in suitable eyes 40^b carried by the toe board 40.

For the purpose of removably retaining this platform in position on the scaffold frame bars 18, I provide an angle bar 42 having an obliquely angled portion 43 terminating in an offset strap 44. In opposed parallel relation to this strap end of the angle bar the metal plate or strap 45 is arranged and riveted or otherwise securely fixed at its upper end to one flange of the angle bar 42. The upper horizontal part of the strap 44 is adapted to be received in a notch or cut-out 41′ in the lower edge of the toe board 40, said strap 44 lying against the inner side of the rail 37 while the strap 45 engages the outer face of said rail. The lower ends of said straps are connected by the transverse clamping bolt 46 extending beneath the rail 37. The upper vertical part of the angle bar 42 has one of its flanges engaged against the outer faces of the guard rails 33 and 34, said flange having secured thereto the angular bracket members 47 and 48 which provide seats for the rails 33 and 34 respectively. Bolts indicated at 49 are then inserted through the transverse openings in said rails and registering openings in the flange of the angle bar 42 and the brackets whereby the said bar and rails are rigidly fixed to each other. Thus, since the angle bar at its lower end is rigidly secured to the outer side rail 37 of the platform 35, it will be readily seen that the latter is securely held against shifting movement relative to the supporting frame bars 18.

As a further means for preventing longitudinal shifting movement of the platform, I provide the channel members indicated at 60 which extend between the bars 18 of each frame and are riveted or otherwise permanently fixed to the top flanges thereof. The opposite side portions of each of these channel members 60 is of substantially U-shaped form, the corresponding upper ends of the spaced parts of said flanges being provided with openings therethrough to removably receive the bolts shown at 61. When the platform is placed in position upon the frame bars 18, the outer rail 37 thereof is received in these channel members 60, one of the cross beams 38 being seated in the U-shaped inner wall of each of said channel members. The bolts 61 are then inserted and extend transversely across the upper edge of the rail 37. It will be understood of course, that the lower edge of the toe board 40 is suitably cut away or recessed to accommodate the fastening bolts 61. Thus, the platform will be securely held against any possibility of longitudinal shifting movement relative to the supporting frames.

Adjacent the opposite ends of the inner rail 36 of the platform a U-shaped member 50 is applied thereto, bolts 53 extending between and connecting the spaced upper ends of said members above the rail 36. One side of each of the members 50 carries a suitable bearing bracket 52 in which a roller 51 is mounted for contact with the face of the building wall. Thus, the roller carrying bracket 52 may be easily, quickly and rigidly fixed to the platform structure or removed therefrom when necessary. It will be readily understood that by the provision of such rollers 51 for contact with the face of the wall, abutting engagement of the ends of the frame bars 18 or of the inner side of the platform with the wall face is prevented, and marring of the face of the finished part of the wall structure in the vertical adjustment of the scaffolding is thus obviated.

From the foregoing description considered in connection with the accompanying drawings, the manner of use and several advantages of my improved scaffolding will be readily understood. It will be evident that by reason of the manner of connecting the inner and outer suspending cables to the hoisting devices as above explained, I avoid the provision of such hoisting devices at the inner side of the scaffolding as has heretofore been the custom with scaffolding of this type, so that the masons or workmen standing on the scaffold platform may have maximum freedom of unobstructed movement in positioning or setting the large heavy blocks of stone in the building wall. As seen in Fig. 2 of the drawings, a large number of the stone blocks as indicated at S may be stored upon the upper floors of the building above the scaffolding where they will be protected from the deteriorating effects of the elements, and these blocks then successively lowered by means of the block and tackle indicated at 55 suspended from a fixed beam 56 projecting outwardly from one of the upper building floors. The block of stone may be thus lowered adjacent to the face of the building wall and may be readily guided and adjusted by the workmen standing on the scaffold platform 35, to the required horizontal position and then moved rearwardly and set in the proper vertical position in the wall of the building. In this manner, it is evident that the placing or setting of such building stone can be greatly expedited by means of my new scaffolding, and with considerably reduced manual effort by the workmen in handling the stone blocks.

In installing the scaffolding, before the platform 35 is arranged in position upon the frames 18, the operators move the respective levers 14 downwardly, and finally urge the same with the foot outwardly until the fingers 15′ of the pawls 15 engage bar 17, thus releasing said pawls from connection with the drum ratchets 11. At the same time, the pawls 13 are lifted out of engagement with the ratchet teeth, thus permitting the cables to be freely unwound from the drums and then suitably attached at their upper ends to the beams 27.

As shown in Figs. 10, 11 and 12 of the drawings, I may provide a convenient means for anchoring the scaffold suspending cables at their upper ends consisting of the pair of channel bars 62, the closed sides of these channel bars being disposed in spaced parallel relation. Between these channel bars at one of their ends, the shank of a beam engaging lug 63 is permanently bolted or riveted and is adapted for engagement over the inner edge of the top flange of an I-beam of the building indicated at B. A second locking lug 64 is slidably or adjustably mounted upon the channel bars 62, said lug having a part extending transversely across the lower flanges of said channel bars and provided with an opening to receive the bolt 65 extending upwardly between the bars 62 and through an opening provided in the top plate 66 extending transversely across the top flanges of the angle bars. By properly adjusting the nut 67 threaded on this bolt, said plate 66 and the shoe or lug 64 may be rigidly clamped in adjusted position upon the channel bars 62.

Intermediate of their ends, the channel bars 62 are provided in their opposed walls with openings to receive the bolt 68 which is adapted to also engage through one of a series of spaced openings 70 provided in the truss bar 69. The other end of this bar has pivotally connected therewith as at 72, the angular bearing plate 71. The angular portions of this plate are adapted to be engaged against one side of the beam B, in contact respectively with the base flange thereof and with the vertically extending web.

At other suitably spaced points, the opposed walls of the channel bars 62 are provided with openings to receive the cable attaching bolts 73 which extend through suitable reinforced eyes on the ends of the scaffold suspending cables 28 and 29 which are positioned between the channel bars 62. The other or outer ends of the bar 62 may be securely bolted together as desired, as indicated at 74. This anchoring device for the upper ends of the cables provides a light and easily handled device which can be easily and quickly applied to one of the upper horizontal beams of the steel skeleton structure of the building being erected. The channel bars 62, are very rigidly and securely held in connection with the beam and possess adequate structural strength for sustaining the scaffolding and the load which may be imposed thereon.

The suspended scaffold structure may be also easily and quickly adjusted vertically as the erection of the building wall progresses by the manipulation of the levers 14 of the respective hoisting devices. When the two drums are rotated simultaneously in the movement of these levers, approximately the same amount of cable will be wound on each drum. However, in case of an uneven winding of the cables, either of the pawls 15 may be quickly released so that one drum will remain stationary while the other is rotated. In this manner, the scaffold platform 35 may be kept on an even level throughout its length.

In lowering the scaffold, the cables 28 and 29 may be either simultaneously or independently unwound from the respective drums by moving the pawls 13 and 15 to released positions out of engagement with the ratchet teeth 11. In the normal operation of the hoisting device, the vertically disposed toe board 40 on the platform 35, is in the path of movement of lever 14, and the lower end of said lever striking against the toe board, prevents the fingers 15′ of the pawls 15 from engaging with the stop bar 17, thus obviating the accidental or unintentional release of these pawls from engagement with the drum ratchets.

In dismantling the scaffold, the bolts 49 are removed, and the guard rails 33 and 34 then removed from the retaining loops 31 and 32 on the frames of the hoisting devices. After removing the bolts 61, the toe board 40 of the scaffold platform is then swung inwardly and downwardly to a horizontal position so that after removing the clamping bolt 46, the lower end of the angle bar 42 may be detached from the platform rail 37. The platform 35 is now removed from the supporting frame bars 18 and the two platform supporting frames are then swung upwardly upon the pivot rod 7 to substantially the dotted line position illustrated in Fig. 4 of the drawings to dispose said frames in close relationship to the frame bars 5 of the hoisting devices. These two frame structures together with the platform 35 and angle bar 42 may then be very compactly arranged so that the whole will occupy comparatively little space during transportation, or when stored away for future use. Thus, it will be appreciated that my new scaffolding offers numerous conveniences in practical use, in that the several parts thereof may be easily and quickly assembled in their proper relative positions and suspended with relation to the wall of the building, and is provided with means insuring maximum safety to the masons or

workmen while offering a minimum of obstruction to their free movements on the scaffold platform in the setting or placing of the wall blocks or stone. The several parts of the scaffolding, while of comparatively light weight, are very rigid and substantial in construction and provide the maximum load sustaining capacity in scaffolding of this type, consistent with the desired ease and facility in the adjustment of the scaffold structure by means of the hoisting devices.

I have herein referred to a practical embodiment of my present improvements which has given excellent results in actual use. Nevertheless, it will be understood that insofar as the essential features of my present disclosure are concerned, the same may also be embodied in various other alternative structural forms, and I therefore reserve the privilege of resorting to all such legitimate changes in the form, construction and arrangement of the several parts thereof as may be fairly embodied within the spirit and scope of the appended claims.

I claim:

1. Suspended scaffolding comprising spaced vertical frames, a horizontal frame connected to the lower end of each vertical frame, a scaffold platform removably supported upon said horizontal frames, a longitudinally extending guard rail, said vertical frames having means removably receiving said rail, a rigid member and means for releasably connecting said member with said guard rail and the platform to prevent displacement of said platform relative to the frames, and suspending means for the scaffolding including hoisting drums rotatably mounted in said vertical frames.

2. In scaffold structure, frames connected with each other at one of their ends to extend respectively in vertical and horizontal planes, means on the vertical frame to removably support a horizontal guard rail, a platform removably supported on said horizontal frame, and a rigid member connected with the guard rail having means at one of its ends for detachable connection with said platform to hold the latter against shifting movement relative to the horizontal frame.

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