Aug. 22, 1961 A. C. MORGEN 2,997,126

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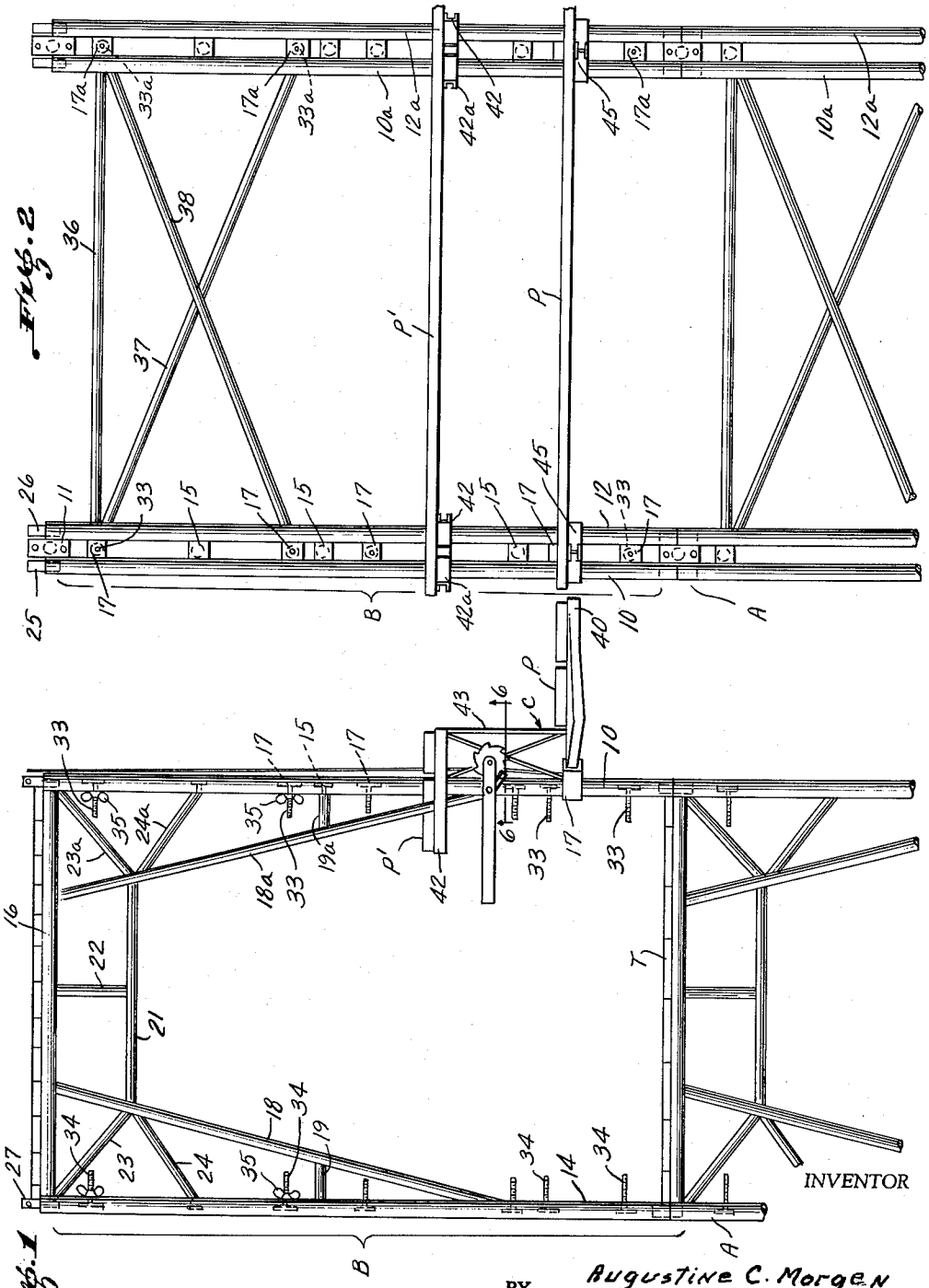


Fig. 2

Fig. 1

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Aug. 22, 1961 A. C. MORGEN 2,997,126

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Filed Dec. 27, 1954 3 Sheets-Sheet 2

Fig. 7

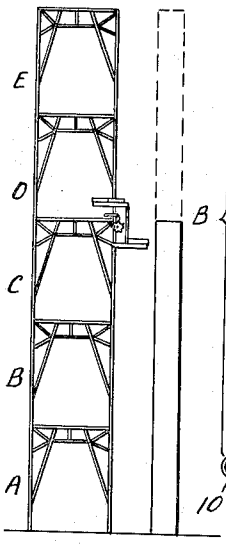
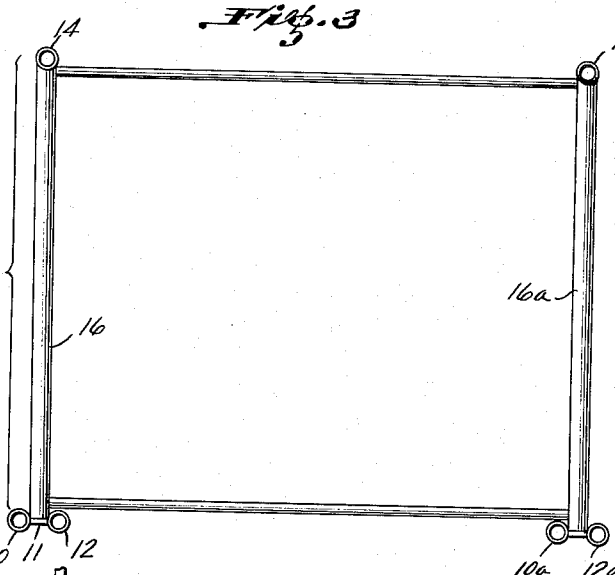


Fig. 3



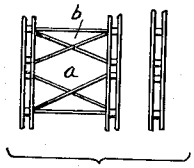
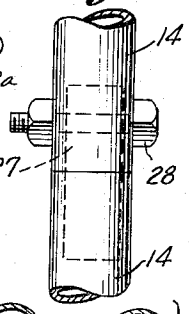


Fig. 11

Fig. 4



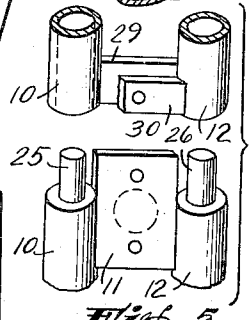


Fig. 5

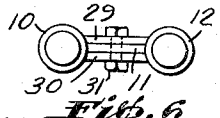


Fig. 6

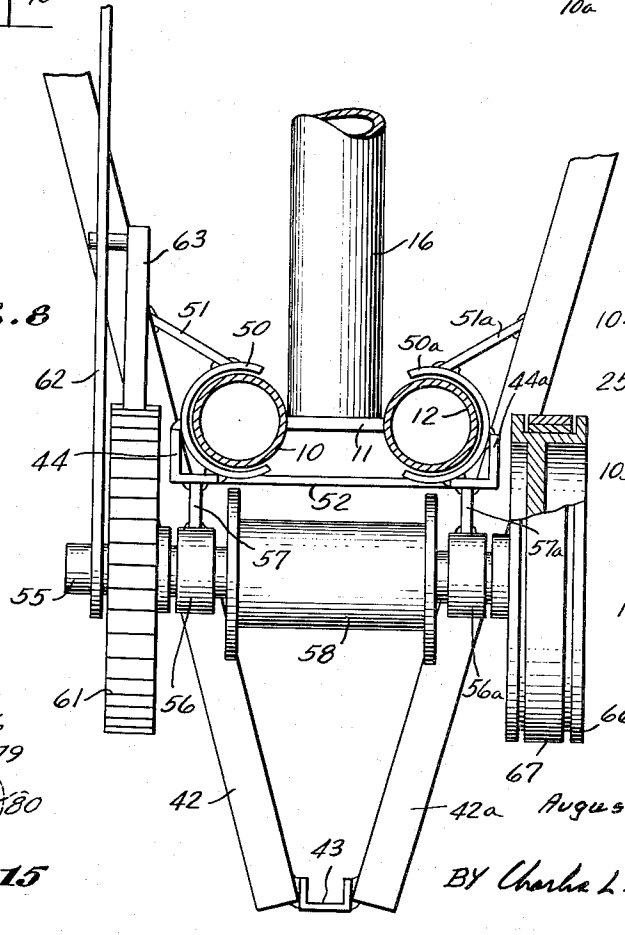


Fig. 8

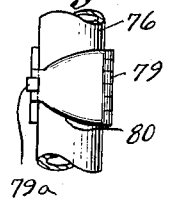


Fig. 14

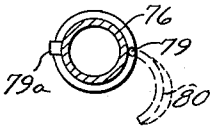


Fig. 15

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Filed Dec. 27, 1954 3 Sheets-Sheet 3

Fig. 10

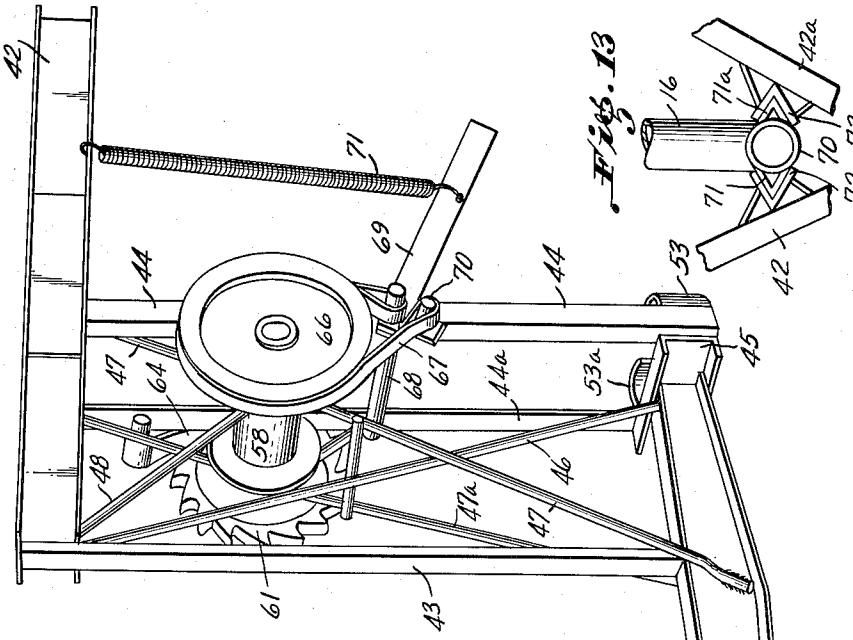


Fig. 13

Fig. 12

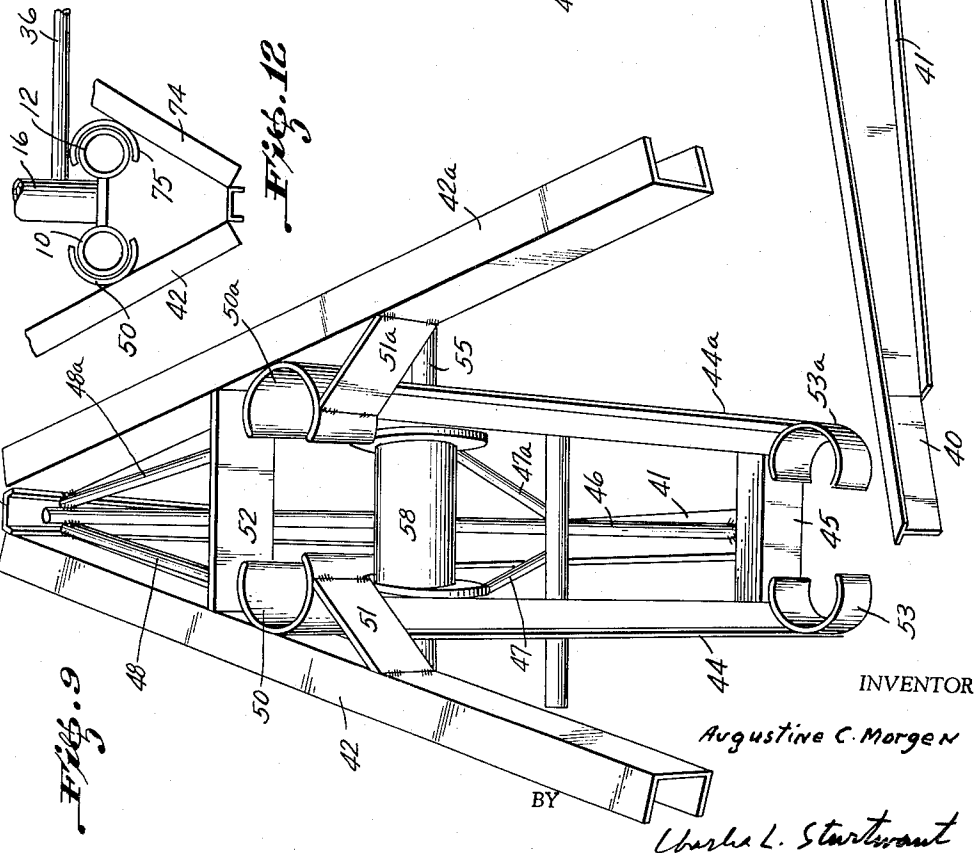


Fig. 9

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2,997,126

SCAFFOLDING

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Filed Dec. 27, 1954, Ser. No. 477,744
4 Claims. (Cl. 182—148)

The present invention relates to new and useful improvements in scaffolding, and more particularly to such improvements in sectional scaffolds of the knock-down type.

In general, the invention contemplates the provision of scaffolding formed of a plurality of sections which may be assembled one above the other to increase the height of the scaffolding as the work progresses, and which may be rapidly disassembled to a knock-down condition after completion of the work. For example, scaffolding may be conveniently employed in the erection of masonry walls and the like wherein the laying of bricks or the like progressively increase the height of the wall or similar structure, and the scaffolding can be correspondingly increased in height. To this end, the scaffolding includes end sections of skeleton form which may be interconnected by braces therebetween, usually along the sides thereof. These end sections may be superposed one upon the other and braced to provide vertical scaffold sections affording the desired increase in height as the work progresses in height. There is provided a platform structure connected to the scaffold sections in a manner permitting the platform to be progressively elevated along the scaffold sections to properly position the worker as the work progresses.

With the above in mind, one of the principal objects of the present invention is to provide an improved scaffolding substantially of the above type wherein the scaffold sections are constructed and arranged, and may be assembled in a manner to greatly facilitate the mounting of the elevator platform supports and the free travel thereof vertically along the scaffold sections.

Another object of the invention is to provide a scaffolding substantially of the above type wherein the scaffold sections present continuous rail portions on which the platform supports or carriages are slidably mounted.

A further object of the invention is to provide between the platform supports and the scaffold sections an improved slidable connection affording increased stability and safety for the same.

A still further object of the invention is to provide an improved connection between adjacent superposed scaffold sections so as to maintain the rail portions unobstructed for travel of the platform carriages without interference.

A still further object of the invention is to increase the safety factor of the platform by providing the scaffold sections with pairs of double rail portions with which mounting means on the platform supports are in embracing relation.

A still further object of the invention is to provide improved carriages for supporting multiple platforms and drum and brake elevating mechanisms.

The invention still further aims to provide a scaffolding assembly substantially of the above type which is of simplified construction facilitating assembly and disassembly thereof; which is of rugged construction affording maximum safety for worker and tender; which is relatively simple to manufacture, and which is thoroughly efficient and reliable in intended operation.

The above and other objects of the invention will in part be obvious and will be hereinafter more fully pointed out.

In the accompanying drawings:

FIG. 1 is an end elevation showing one upper end section of the scaffold with the platforms thereon and with the upper section fitted in assembled relation on a lower end section;

FIG. 2 is a side elevation of FIG. 1 showing the interconnecting bracing means and the platforms but with the elevating means omitted;

FIG. 3 is a top plan view of one vertical scaffold section formed of a pair of end sections and the bracing means interconnecting the same;

FIG. 4 is a detail showing the telescoped connection between the vertical columns of the end scaffold sections;

FIG. 5 is a fragmentary side view of the adjacent ends of the double post structures of adjacent end sections prior to interfitting connection therebetween;

FIG. 6 is a transverse section showing the ends of FIG. 4 interfitted and secured by a bolt or the like extending through the aligned apertures in the connecting plates;

FIG. 7 is a more or less diagrammatic side elevation showing the scaffold sections in position adjacent a wall and with parts in dotted lines showing the extension thereof;

FIG. 8 is an enlarged and partially fragmentary section substantially along the line 6—6 of FIG. 1 showing the connection of one platform carriage with a pair of vertical columns and showing the elevating mechanism and brake control;

FIG. 9 is a perspective view of one of the platform carriages taken from above the same;

FIG. 10 is a perspective view of the platform carriage taken from the side thereof;

FIG. 11 is a more or less diagrammatic view showing the manner of initially setting up the scaffold section;

FIG. 12 is a fragmentary section, similar to FIG. 8, but showing a modification in which the inner leg of the V-channel of the platform carriage terminates short of the side bracing;

FIG. 13 is a fragmentary section through a single vertical post as a modification in which opposed rail sections on the post are engaged by complemental guides on the carriage;

FIG. 14 is a side view of a modified form of guide having a pivoted section;

FIG. 15 is a fragmentary section of FIG. 14 showing open and closed positions of the guide.

Referring more in detail to the accompanying drawings, and more particularly to FIGS. 1 through 5 at this time, each end scaffold section may be of various sizes but for example may approximate eight feet in height, six feet in width and spaced from one another at intervals which may vary but a spacing of about seven feet will serve as an example. Since each end section is identical, the description of section B will suffice. This end section includes a pair of vertical posts **10**, **12** which may be conveniently formed of structural steel tubing and these posts are spaced slightly apart, approximately two inches, are secured in such spaced relation by vertically spaced plates arranged in predetermined spaced relation and secured, as by welding, to the posts. These plates will be referred to hereinafter as each has functions in addition to the securing and spacing of the posts **10**, **12**. These posts **10**, **12** form double track portions for the platform carriage and are positioned adjacent the wall or other work being operated upon.

The end section B has a single tubular post **14** spaced from the double posts and connected thereto by a top horizontal tubular member **16** which is secured by welding or the like to the vertical post **14** and to a connecting plate **11** welded between the posts **10**, **12**, and the hori-

zontal member **16** may also be welded to the posts **10**, **12** for added strength. As seen in FIG. 3, the vertical post **14** is centrally disposed between the bounding planes of the posts **10**, **12** to afford a triangular arrangement of the posts. There is a network of braces interconnecting the vertical and horizontal posts. Thus, the elongated braces **18**, **18***a* are secured, as by welding or the like, to the top horizontal member **16** intermediate the ends thereof and the bottom end of the brace **18** may be similarly secured to the vertical post **14** intermediate the ends therof. However, the bottom end of the brace **18***a* is secured to an additional plate **15** which is disposed between the posts **10**, **12** and welded thereto to provide additional spaced bracing of these posts. There are additional short horizontal braces **19**, **19***a*, **23**, **23***a*, **24**, **24***a* between the braces **18**, **18***a* and the vertical posts, the braces **19***a*, **24***a* being secured to additional plates, such as **15**, serving as spacers and bracing between the posts **10**, **12**. A horizontal cross brace **21** is secured, as by welding or the like, between the upper portions of the braces **18**, **18***a* and this brace **21** is further united to the tubular member **16** by means of the brace **22**. Each end scaffold section is thus effectively interbraced and the posts **10**, **12** are maintained in spaced position by the plates referred to.

At the top of each post **10**, **12**, **14** there are provided pins **25**, **26**, **27**, respectively, which fit within the posts and are secured by welding or the like. These pins project above the posts and are adapted to fit with the hollow ends of the corresponding posts of the superposed scaffold section to provide a telescoped joint. Thus, as shown in FIG. 4, the pin **27** of the lower post **14** is fitted within the superposed post **14** of the next section and a securing bolt **28** passes through registering apertures to secure the posts in telescoped assembled position.

In similar manner, the pins **25**, **26** of the posts **10**, **12** telescope with the posts of the superposed section. However, in order to maintain the posts **10**, **12** unobstructed throughout the major portion of the peripheries thereof, the bolt securing means is not passed through the posts. But for securing purposes, it should be noted that the upper end of plate **11** projects upwardly from the posts substantially the extent of the pins **25**, **26** and is centrally apertured. The bottom ends of the corresponding posts **10**, **12** of the superposed section are joined by plates **29**, **30** which are spaced from one another a distance to snugly receive therebetween the projecting end of the plate **11** as the posts are telescoped together and when assembled the plates have their central apertures aligned to receive a securing bolt **31** or the like. With manner of securing the superposed posts **10**, **12**, it will be seen that the major periphery of each post is unobstructed even at the telescoped joints therebetween so as to present track portions with substantial unobstructed surface portions throughout.

As shown in FIGS. 1 and 2, pairs of end scaffold sections have been assembled in spaced relation and one pair of section superposed on a lower pair of sections. To maintain the spaced relation of the end sections, the several spacer plates **17** between the posts **10**, **12** are provided with bracing pins **33** arranged in predetermined spaced relation and projecting toward the post **14** which, in turn, has similarly spaced bracing pins **34** suitably secured thereto as by welding or the like. These bracing pins may be threaded to receive complemental partners, such as wing nuts **35**, or the pins may be transversely apertured to receive cotter pins, nails or the like.

A platform carriage, generally indicated at C in FIG. 1, but removed from FIG. 2, will be described hereinafter with reference to FIGS. 8, 9 and 10. There is such a carriage slidably mounted on each pair of vertical posts **10**, **12** to recevie planking P for the mason's platform and planking P' for the material platform, there being additional such planking spanning the horizontal members **16** to form the tender's platform T. Since the material platform P' projects inwardly of the posts **10**, **12** and moves with the carriages and mason's platform, bracing between the posts **10**, **12** is selectively positioned to permit the vertical movement of the platforms. Thus, as more particularly shown in FIG. 2, lower bracing is eliminated but there is upper bracing including a horizontal bracing bar or tubing **36** and crossed similar braces **37**, **38**. These bracing bars or tubes have flattened ends which are apertured to receive therethrough the corresponding bracing pins **38** to which the bracing bars are secured as indicated above. As to bracing between the outer single vertical posts **14**, both upper and lower bracing may be simultaneously provided for required stability and strength. A lower bracing bar may remain as shown. As the platforms are elevated to position where the upper bracing would interfere, such bracing, or only the cross braces **37**, **38** are removed and secured in the same manner to lower pairs of bracing pins **33** below the material platform. Thus, it will be apparent that the bracing may assume various forms and positions for required strength as the platforms are moved vertically.

A platform carriage will now be described with references to FIGS. 8, 9 and 10. Each such carriage comprises a rigid skeleton framework including a horizontal beam **40**, such as a T-beam, reinforced along the bottom thereof by a structural plate **41** providing a channel formation. This beam **40** supports the planking P for the mason's platform. There is an upper support structure illustrated as including horizontal channel beams **42**, **42***a* arranged in V-formation with the apex thereof disposed vertically over the lower beam **40** and connected thereto by a vertical channel bar **43**. Additional vertical channels **44**, **44***a* are secured to the channels **42**, **42***a*, respectively, and to a cross channel **45** secured at the inner end of the lower beam **40**. A network of reinforcing rods are provided and includes a central rod **46** connected between the inner end of the beam **40** and the channel **43** at the apex of the channels **42**, **42***a*; rods **47**, **47***a* secured to the beam **40** adjacent the vertical channel **43** and to the channels **42**, **42***a*, respectively, spaced from the apex so as to cross the central diagonal rod **46**; and shorter diagonal rods **48**, **48***a* secured to the vertical channel **43** at the apex of the channels **42**, **42***a* and to the channels **44**, **44***a*, respectively, intermediate the ends thereof to cross the bars **47**, **47***a*. Thus, it will be seen that these reinforcing bars or rods constitute a network of crossed structural reinforcing elements for added strength. It is to be understood that the various elements of the carriage framework may be secured together in any suitable manner, as by welding or the like.

An upper pair of arcuate shoes **50**, **50***a* are secured as by welding to the channels **42**, **42***a* and to the vertical channels **44**, **44***a*, respectively. Reinforcing plates **51**, **51***a* additionally connect these shoes to the channels **42**, **42***a*, as does a cross plate **52** between the channels **42**, **42***a* (see FIGS. 8 and 9). At the lower end of the channels **44**, **44***a*, there is a lower pair of similar arcuate shoes **53**, **53***a* secured thereto and to the cross channel **45** by welding or the like. These upper and lower pairs of shoes are substantially half circles, or slightly more, and the shoes of each pair face one another to engage and embrace corresponding portions of the posts **10**, **12** which form track portions over which the shoes are slidable. The shoes may have the arcuate edge portions slightly flared or bevelled to facilitate passage along the posts **10**, **12**.

An elevating and lowering mechanism for each carriage is mounted thereon and includes a shaft **55** mounted in bearings **56**, **56***a* which are supported by brackets **57**, **57***a* from the vertical channels **44**, **44***a*, respectively (see FIG. 8). A winding drum **58** is mounted on shaft **55** and is attached to cable **60** which may have any suitable loop formation, or the like, at its upper free end for attachment to the uppermost scaffold section, as by attachment to the vertical pins **25**, **26**, or in other suitable manner.

At one end of the shaft **55**, there is fixed a ratchet wheel **61** and a raising lever **62** is mounted on the shaft adjacent the wheel. The lever carries a spring urged pawl **63** to engage the wheel ratchet teeth so that downward movement of the lever will cause rotation of the drum **58** in a direction to wind the cable **60** thereon and elevate the carriage. There is also provided a locking dog **64** which is spring urged into engagement with the ratchet teeth to positively prevent unwinding movement of the drum.

At the opposite end of the shaft **55**, there is fixed a brake wheel **66** having a braking belt **67** engaging the same. As more clearly shown in FIG. 10, a pin **68** is fixed to the vertical channels **44**, **44***a* and one end of the brake belt is secured thereto. A brake lever **69** is pivotally mounted on the pin **68** and carries an offset pin **70** to which the opposite end of the brake belt is secured. A loading spring **71** connected between the brake handle **69** and the channel **42** constantly urges the lever upwardly in brake applying direction to prevent unwinding movement of the drum.

To erect the scaffolding, the arcuate shoes or guides **50**, **50***a*, **53**, **53***a* are "threaded" on the adjacent posts **10**, **12** of an end section, it being understood, of course, that the spacing of the shoes is complemental to the spacing of the posts so as to provide a snug but slidable fit therebetween. One carriage is then fastened at the bottom end of each of adjacent pairs of rail or track posts **10**, **12** and a horizontal brace **36** and cross braces **37**, **38** connected to a lower group of pins **33**, **34** in the lower position "*a*" shown in FIG. 11 so that the thus connected and spaced end scaffold sections B are maintained in upright position. Then a horizontal brace **36** and cross braces **37**, **38** are applied to an upper group of pins **33**, **34** in the position "*b*" shown in FIG. 11, after which the lower cross braces **37**, **38** are removed as obstruction to the inwardly extending carriage channels **42**, **42***a* and planking carried thereby as the carriages and platforms are elevated. As the material platform reaches a height where it would be obstructed by the bracing in the upper position "*b*," this bracing is removed and shifted to the lower position "*a*" so the platforms can be elevated.

Each pair of end sections forms, with the bracing between the posts **14** and the paired posts **10**, **12**, rectangular or square scaffold sections which may be erected along the length of the work with each such section spaced as shown in FIG. 11. For the platforms to bridge the space between adjacent sections (these may or may not be connected for bracing), planking may be doubled on adjacent carriages or the ends of the planking may be lapped. The nature of the particular job will determine whether the scaffold will be initially erected to a predetermined height, in which case the end of the cables **60** will be secured to the topmost section; or whether the scaffolding will be increased in height section by section (as in FIG. 7 illustrating the erection of a wall W) in which case the carriages can be conveniently and temporarily secured to their paired posts, or the carriages may be shored to the adjacent tender platform, while the ends of the cables are secured to the upper ends of the next higher scaffold section. In some instances, it may be feasible to directly connect several paired posts along the work by substantially the same bracing as illustrated for each discrete square unitary section.

A tender on the supply and tender platform T may conveniently manipulate the brake lever **69** and raising lever **62**. Thus, the brake lever **69** may be depressed against the action of the loading spring **71** to release the brake belt, and the raising lever may be manipulated by oscillation during which the down stroke will rotate the drum **58** to wind the cable **60** thereon and accordingly elevate each carriage and the platforms carried thereby the distance desired by the mason on his platform. To lower a platform carriage, the spring loaded dog **64** is released from engagement with the ratchet wheel **64**, as is the lever **62** and the pawl **63**, and the operator can then

manipulate the brake lever **69** to lower the carriage which will slide down the posts **10**, **12** under control of the brake.

From the foregoing description, it will be appreciated that the telescopic connection between superposed vertical posts provides a connection free of obstruction so that the major peripheral surface of such vertical posts is unobstructed, thus affording clear track or rail surfaces which are embraced by the carriage guides or shoes which slide smoothly therealong even across the connections between superposed posts. The arcuate guides or shoes of each pair face one another to thus securely lock the associated carriage in slidable association with the paired rail posts **10**, **12** but in some instances a single rail post may be employed in which case the spacing of the shoes will be altered accordingly. The fastener means between the mating connecting plates **11**, **29**, **30** is disposed entirely between adjacent vertical posts and these plates constitute a very minor interruption to the continuity of the surface of each post, and this interruption is disposed between the ends of the arcuate shoes so there is no obstruction to sliding movement of the shoes. For convenience the material platform P′ projects inwardly of the scaffold but as pointed out, the bracing between the rail posts can be quickly shifted so as not to obstruct the platform and without detracting from safety requirements since the comparable upper and lower bracing remains between the outer vertical posts **14** and horizontal braces may remain at the top and bottom of the rail posts except while shifting from one section to another. Other shapes of rail posts and carriage supporting means may be provided so long as there is interlocking embracing therebetween without special separate track attachment for the scaffolding; and releasable carriage supporting means may be employed such as pivoted sections locking in track engaging position, and anti-friction balls or rolls might be incorporated with the carriage supporting means if desired. As example of various modifications, FIG. 12 shows the inner or inboard leg **74** of the V-channel frame of the carriage as terminating short of the side bracing **36** and the associated guide shoe **75** is positioned in relation to the post so that both the shoe and the channel leg **74** will clear the side bracing. Also, as shown in FIGS. 13 and 14, a single vertical post **70** may be employed and provided with oppositely projecting rail sections **71**, **71***a*, of suitable configuration such as V-shaped or otherwise, and the platform carriage carries guide shoes **72**, **72***a* complementally shaped with respect to the rail sections and embracing the same in slidable relation. In FIGS. 14 and 15 there is also shown a single vertical post **76** and a guide shoe **77** of the platform carriage. This guide shoe may or may not completely surround the post but includes a section **78** pivoted at **79** as by spring loading to closed position, which pivoted section may be secured in closed position by any suitable form of releasable fastener connection generally designated by the numeral **79***a*. This pivoted section may be released manually to clear the large horizontal member **16** and the end section bracing, or the bracing pins, if necessary, as the platform carriage is elevated or lowered; or its upper and lower edges may be shaped to present cam surfaces **80**, to shift the same automatically by engagement with an obstruction, such as the horizontal member **16**, against the action of its spring loading which is sufficient for safety purposes because the carriage is at all times, during normal operation, supported by the cable means **60** and the guide means to prevent tilting and maintain the same in stable position on the track surfaces.

While certain forms of the invention have been shown for purposes of illustration, it is to be clearly understood that various changes in the details of construction and arrangement of parts may be made without departing from the spirit and scope of the invention as set forth in the appended claims.

I claim:

1. A sectional scaffold adapted to be increased in height vertically along a work area, and comprising a plurality of substantially identical sections adapted to be superposed one above the other and each section including a plurality of interconnected vertical posts with a pair of said posts spaced laterally along the work area, opposed portions of the surfaces of the posts adjacent the work area providing continuous and unobstructed trackway surfaces peripherally along a substantial portion of the periphery thereof, brace means connecting adjacent superposed vertical posts at points removed from said trackway surfaces whereby to maintain the unobstructed continuity thereof, and a vertically shiftable platform carriage including vertically spaced platform supports connected by a substantially vertical frame and having guide and support means comprising vertically spaced guide shoes carried by said frame with the shoes of each pair facing one another for embracing the trackway surface of one of said posts around a sufficient periphery of the post to trap the platform carriage thereon against outward separation of the carriage from the post and support the platform carriage for travel there along without engagement of the guide and support means with the brace means.

2. A sectional scaffold as claimed in claim 1, wherein the vertical posts adjacent the work area each comprises a pair of closely spaced vertical post members at each end of each section along the work area with vertically spaced connecting members between each of the closely spaced apart post members substantially at points of closest proximity between the post members whereby to leave the remaining surfaces free as trackway surfaces to be engaged by the mutually facing guide shoes of the guide and support means.

3. A platform supporting carriage for use with scaffolding having vertical posts with the surface thereof providing track surfaces, and comprising upper and lower frame sections connected by a vertical frame section with one of said frame sections including a V-shaped section to straddle the adjacent scaffold post, spaced opposed guide shoes secured to the vertical frame section and of a peripheral extent to engage opposite portions of the track surfaces of a vertical post as well as a portion

of the track surface remote from the vertical frame section whereby to trap the carriage but leaving the space between the guide shoes entirely free for bypassing transverse bracing obstructions, and cable winding and braking mechanism mounted forwardly of the guide shoes on the vertical frame section and between the upper and lower frame sections for effecting vertical controlled travel of the carriage.

4. A platform supporting carriage as claimed in claim 3, wherein the upper and lower frame sections project in opposite directions from the vertical frame section, and wherein said winding and braking mechanism is disposed below the apex of the V-shaped section and outwardly of the vertical frame section.

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