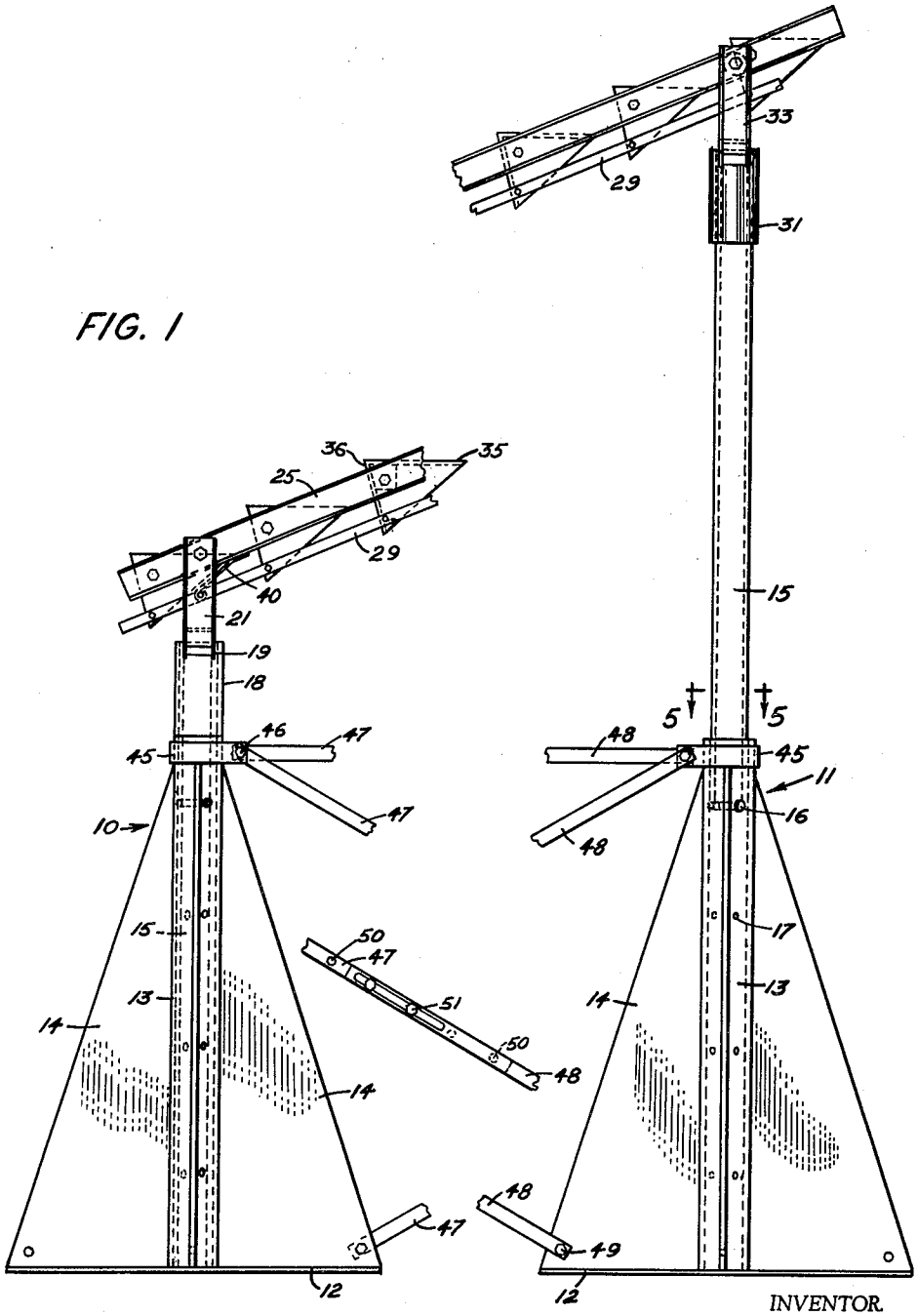
June 22, 1965 G. I. DANIEL 3,190,390

COMBINATION SCAFFOLD AND LADDER

Filed April 1, 1964 2 Sheets-Sheet 1

FIG. 1



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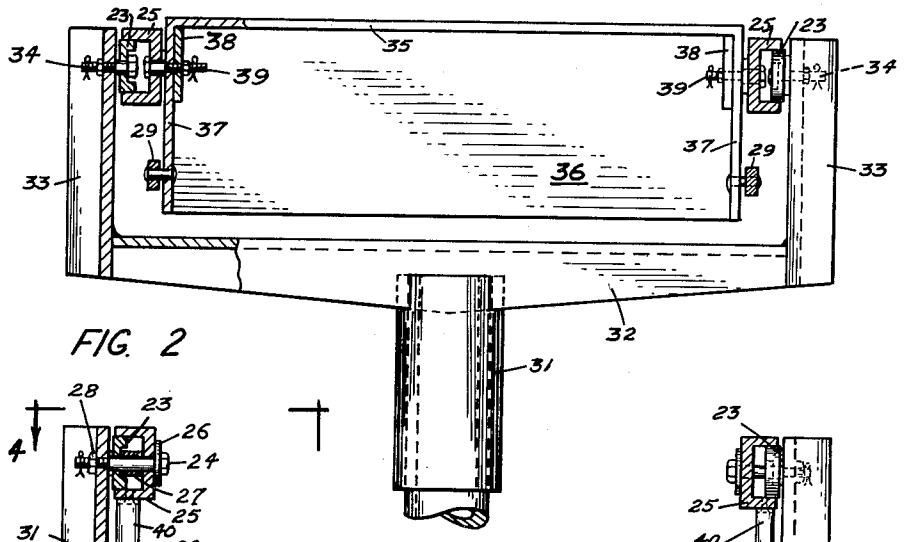


FIG. 2

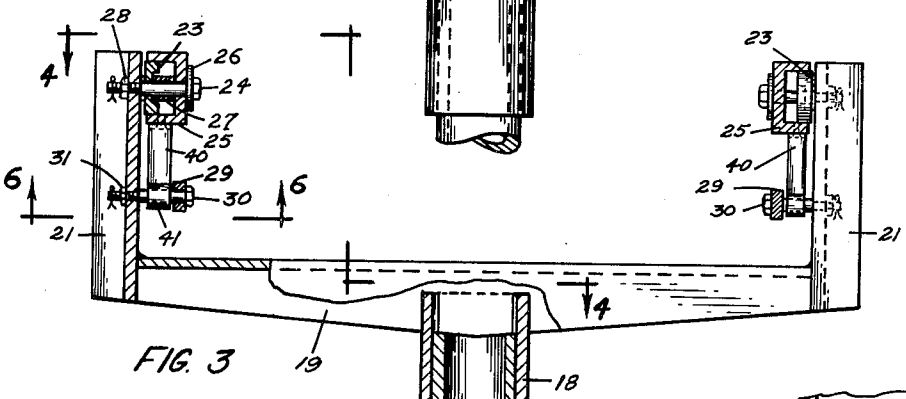


FIG. 3

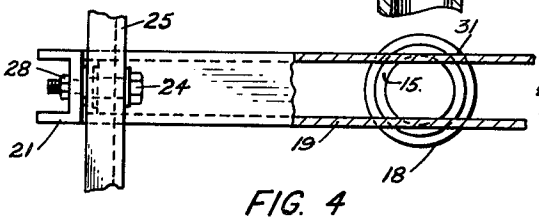


FIG. 4

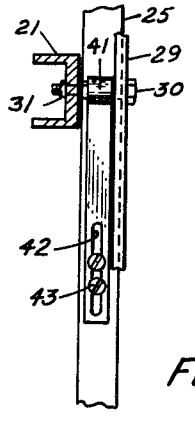


FIG. 6

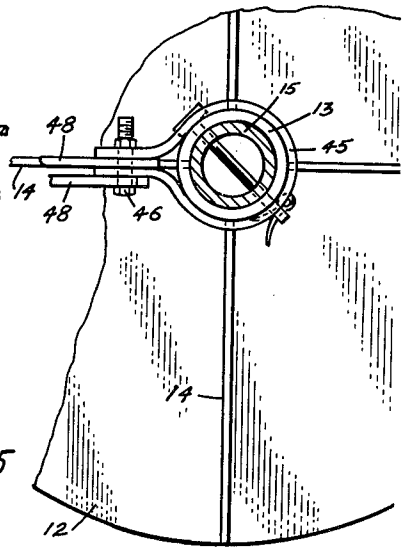


FIG. 5

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3,190,390
COMBINATION SCAFFOLD AND LADDER

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5 Claims. (Cl. 182—1)

The present invention relates to scaffolds and ladders and more particularly to a ladder and pedestal supports by means of which the ladder can be converted into a scaffold.

Heretofore ladders have been of simple construction to permit use in various inclined positions and some ladders have been used as the platform of a scaffold, but it has been difficult to arrange any of the structures of the prior art known to applicant to provide for effectively providing a ladder of general utility with the same ladder useful with standards to obtain a scaffold suitable for supporting workmen in the most advantageous position for working on inclined gables and the like.

An object of the present invention is to provide a ladder and scaffold combination which overcomes the above-mentioned disadvantages of the prior art and assures horizontal foot-engaging treads in all positions of the ladder and in all positions of a scaffold while permitting inclined arrangement of the scaffold.

Another object is to provide adjustable pedestals which can be effectively positioned and held in supporting relation to a scaffold platform to assure safety at all times.

Other and further objects will be apparent as the description proceeds and upon reference to the accompanying drawings, wherein:

FIGURE 1 is an elevation of a pair of pedestals with tie rod braces and a ladder according to the present invention, with a portion of the ladder and tie rods broken away to save space.

FIGURE 2 is an enlarged fragmentary section of a ladder shown in horizontal position with a removable yoke which slidably supports the ladder at one end in a scaffolded operating relation.

FIGURE 3 is a similar view of the other yoke and the ladder showing the rails of the ladder and the control bars of the steps pivotally connected to the yoke.

FIGURE 4 is a fragmentary plan view, with parts in section, taken substantially along line 4—4 of FIGURE 3.

FIGURE 5 is a horizontal fragmentary section taken substantially on line 5—5 of FIGURE 1.

FIGURE 6 is an enlarged view showing the releasable means to prevent pivotal movement of the ladder treads.

Other and further objects will be apparent as the description proceeds upon more detailed reference to the drawings where like reference numerals indicate like parts throughout. A pair of supports in the form of pedestals **10** and **11** are shown of identical construction and each includes a base plate **12**, a tube **13** extending vertically therefrom with a plurality of gusset plates **14** secured to the base and to the first tube **13** by any suitable means, such as welding or the like, while a second tube **15** of greater length than the first tube **13** is telescopically adjustable relative to tube **13** and is retained in position by bolts or studs **16** passing through transverse bores **17** in the first tube **13** so that the second tube **15** may rest on the studs **16** to maintain any selected height of the upper end of the second tube **15**. A cap **18** made of a tube section is slotted at its upper end receiving a cross member **19** of channel shape of a first yoke welded to the cap **18** with end struts **21, 21** welded to the opposite ends of the cross member **19**. A roller **23** is rotatably mounted on the inner surface of each end strut adjacent the free extremity by means of a shouldered bolt **24** passing through the web of the adjacent channel rail **25** of the ladder with a washer **26** adjacent the outer surface of the web and a spacer **27** between the inner surface of the web and the roller **23**. The channel rail **25** is secured in pivotal relation to the adjacent strut of the yoke by means of the nut **28** which is held in assembled position by conventional means such as a cotter pin.

A control bar **29** is also pivotally connected to each end strut **21, 21** of the yoke by means of a second shouldered screw **30** pivotally passing through an aperture in the control bar **29** and being fixed to the strut **21** by a nut **31** and a cotter pin or the like.

The other yoke includes a slotted cap member **31** to which a cross member **32** is fixed by lying in the slot in the upper end of the cap member **31** and being welded thereto with end struts **33, 33** welded thereto. On the inner surface of each strut **33** adjacent the free extremity a roller **23** is rotatably mounted on a short shouldered bolt **34** about which bolt the roller **23** is freely rotatable and such rollers **23** support the channel-shaped rails **25, 25** of the ladder for longitudinal movement of the ladder relative to the yoke **32, 33, 33**.

The ladder includes the outwardly opening channel-shaped side rails **25** and a plurality of pivotally mounted steps, each including a tread **35**, a riser **36** and ends **37, 37** with reenforcing plates **38, 38** welded to the steps to reenforce the steps where third shouldered bolts **39** pivotally connect each end **37** of each step to the adjacent web of the ladder channel **25** for free pivotal movement of each step **35, 36, 37**. Each end **37** is pivotally connected to the cooperating control bar by means of rivets or the like whereby all of the treads of the steps remain in parallel relation with each other.

The yoke **18, 19, 21, 21** remains with the ladder at all times while the yoke **31, 32, 33, 33** can be moved by relative longitudinal movement with respect to the rails **25** of the ladder.

The yoke **18, 19, 21, 21** when supported by its pedestal **10** prevents the treads **35** and the steps of which the treads are a part from rocking about the pivots **39**, but when the ladder is used independently of the pedestals, the steps may rock about such pivots **39** but to prevent such rocking, a strut member **40** made of relatively stiff flexible resilient strap metal has an eye **41** formed at one end thereof around the bolt **30** and is provided with a slot **42** through which one or more screws **43** pass and are threaded into threaded apertures in the adjacent flange of the rail **25** whereby when the screws **43** are loose the strut **40** may slide relative to the channel **25** and when the screws **43** are tightened the strut **40** fixes the relative positions of the control bar **29** and the associated ladder channel **25**.

The strut connection means **40** serves to fix the position of the steps including treads **35** when the ladder is used without a pedestal retaining the yoke **19, 21, 21** in a definite position.

To prevent lateral separation of the pedestals from each other, each pedestal is provided with a collar **45** of strap metal with the ends secured by a bolt **46**, which bolt passes through the adjacent end of an adjustable length tie rod made of sections **47, 48**. A second tie rod made of sections **47, 48** extends from one collar of one pedestal to the base of the other pedestal and is secured to the gusset **14** by a bolt **49** passing through the gusset and passing through the tie rod section **48**. The means to adjust the length of each tie rod is shown by the center section in which the tie rod section **48** is provided with an elongated slot while the tie rod section **47** is provided with a plurality of apertures **50** through which apertures and slots bolts **51** pass to secure the tie rod sections in adjusted relation. Similarly a tie rod made of sections **47, 48** connects the gusset **14** of one pedestal to the collar **45** of the other pedestal, thereby providing diagonal bracing to assure that the pedestals remain upright.

From the above description it will be evident that applicant has provided a ladder which may be used in the conventional manner and has also provided a scaffold which includes adjustable height pedestals supporting the ladder for use as a scaffold platform, with the structure providing for any angular position of the platform for supporting workmen in the most advantageous position for work on inclined objects such as the gables of a roof.

It will be apparent that changes may be made within the scope of the invention as defined by the valid scope of the appended claims.

What is claimed is:

1. A scaffold and ladder combination comprising a pair of vertically adjustable pedestals, each pedestal including a base for support on a generally horizontal surface, a first tube projecting vertically from the center of said base and fixed to said base, a second tube telescopically mounted within said first tube and a length so one end projects from said first tube, means to adjustably maintain said tubes at various combined lengths to vary the height of each pedestal, a yoke receiving cap rotatably mounted on the projecting end of said second tube, said cap having a yoke receiving slot, a yoke including a cross member with an upstanding strut at each end, said yoke being fixedly mounted in said slot of said cap, a collar on the upper end of said first tube, an adjustable length tie rod extending between said collar of one pedestal and the collar of the other pedestal, an adjustable length tie rod extending between said collar of one pedestal and the base of the other pedestal, and an adjustable length tie rod extending between said collar of the other pedestal and base of said one pedestal whereby said pedestals will be maintained in substantially fixed parallel relation preventing separation of said pedestals, a ladder channel supporting roller mounted on the inner surface of the free extremity of each strut of each yoke, a ladder having a pair of outwardly opening channel shaped rails and a plurality of pivotally mounted steps including treads with risers and ends between said rails, a control bar pivotally connected to one end of each step, another control bar pivotally connected to the other end of each step, means to pivotally connect said rails of said ladder to the strut ends of said one yoke while preventing longitudinal movement of said ladder with respect to said one yoke, means to pivotally connect each control bar to the adjacent strut end of said one yoke in parallelogram relation with respect to the pivotal connections of said steps to the ladder rails and to the control bars, means to releasably secure said control bars against movement relative to said channels, the other end of said ladder being movably supported on the rollers of the other yoke to permit longitudinal movement of the ladder with respect to said other yoke whereby the angular position of said ladder can be adjusted while the treads of said steps remain in parallel horizontal relation.

2. A scaffold and ladder combination comprising a pair of vertically adjustable pedestals, a yoke including a cross member with an upstanding strut at each end mounted on each pedestal, tie rod means between said pedestals preventing separation of said pedestals, a ladder channel supporting means mounted on the inner surface of the free extremity of each strut of each yoke, a ladder having a pair of outwardly opening channel shaped rails and a plurality of pivotally mounted steps including treads with risers and ends between said rails, a control bar pivotally connected to one end of each step, another control bar pivotally connected to the other end of each step, means to pivotally connect said rails of said ladder to the strut ends of one yoke while preventing longitudinal movement of said ladder with respect to said one yoke, means to

pivotally connect each control bar to the adjacent strut end of said one yoke in parallelogram relation with respect to the pivotal connections of said steps to the ladder rails and to the control bars, the other end of said ladder being movably supported on the ladder channel supporting means of the other yoke to permit longitudinal movement of the ladder with respect to said other yoke whereby the angular position of said ladder can be adjusted while the treads of said steps remain in parallel horizontal relation.

3. A scaffold and ladder combination comprising a pair of vertically adjustable supports, a yoke including a cross member with transversely mounted ends on each support, a ladder including rails and a plurality of pivotally mounted steps including treads of substantial length and width, control bar means pivotally connected to each step and to a transversely extending end of one yoke, means to pivotally connect said rails of said ladder to said one yoke while preventing longitudinal movement of said ladder with respect to said one yoke, the pivotal cennections of said control bar means to said steps and to said one yoke being in parallelogram relation with respect to the pivotal connection of each step to said control bar means and the pivotal connection of each step to said rails, and means on the other yoke slidable along the length of the ladder and cooperating with the rails of said ladder to provide for supporting said ladder in different angular positions with respect to said first yoke.

4. The invention according to claim 3 in which means are provided between one support and said one yoke to maintain said one yoke in a definite angular relation with respect to the horizon.

5. A ladder comprising a pair of rails, a plurality of steps including treads pivotally mounted between said rails, control bar means extending in parallel relation along and spaced transversely from the pivotal axes of the steps and from the said at least one rail, said control bar means being pivotally connected to said steps at points spaced from said pivotal mounting of said steps to provide parallelogram relation between said rails and said control bar means and between the pivotal connections of adjacent steps whereby each step pivots with the other steps to maintain the treads in substantially parallel relation at all times, an adjustable strut positively operative in both tension and compression and extending in a direction transverse to the lines defined by the pivotal mounting of any step to each rail and the pivotal connection of the same any step to said control bar means, means to secure one end of said strut to said rail and means to secure the other end of said strut to said control bar means, and means to adjust the effective length of said strut between said securement to said rail and said control bar means to control the angle of the steps with respect to the rails whereby said treads can be made to assume a horizontal position for an infinite number of angular adjusted positions of said ladder with respect to the horizontal, and the treads will be positively maintained in horizontal relation so a weight will be supported on any point on the treads.

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