Jan. 7, 1969 A. K. TALBOT 3,420,334

CANTILEVER CLAMP FOR SCAFFOLD LEDGER

Filed Sept. 1, 1967

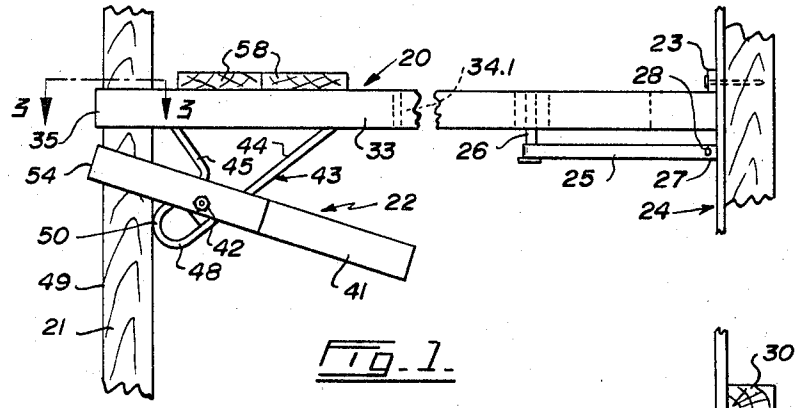


FIG. 1.

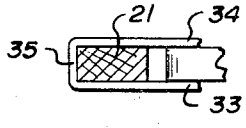


FIG. 3.

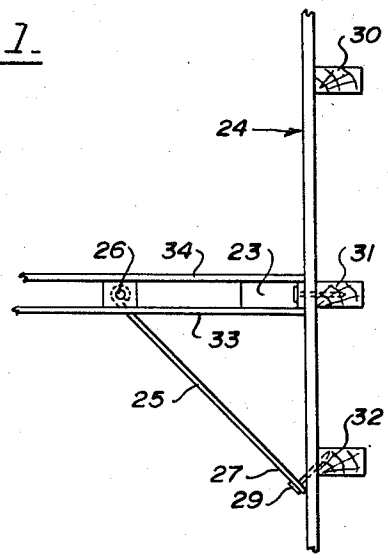


FIG. 2.

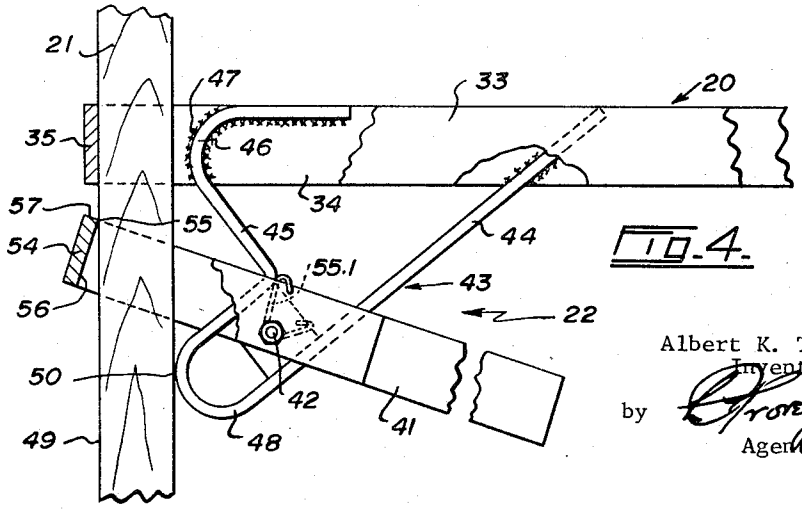


FIG. 4.

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3,420,334
Patented Jan. 7, 1969

3,420,334

CANTILEVER CLAMP FOR SCAFFOLD LEDGER

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Filed Sept. 1, 1967, Ser. No. 665,015
U.S. Cl. 182—229 10 Claims
Int. Cl. E04g 5/08

ABSTRACT OF THE DISCLOSURE

A cantilever clamp for securing a scaffold ledger to a vertical post. An outer end of the ledger extending around and bearing against an outer surface of the post, with a bracket having a bearing portion below the ledger and bearing against an inner surface of the post, defining a cantilever moment arm. A locking lever with an outer end around the post outer surface, the lever sloping downwards from the post and pivoted to the bracket, downward movement of the ledger rotating the lever so locking the post against further downward movement.

BACKGROUND OF THE INVENTION

The invention relates to a cantilever clamp for securing a scaffold ledger to a vertical post.

My Canadian Patent 741,706 describes a scaffold structure including means to secure the ledger to the vertical post member. In this structure, as well as in many prior art scaffolds, an inner end of the ledger is supported for instance by a block secured to a wall of a building against which the scaffold is erected. An outer end of the ledger is secured to the post by a fastening adapted to provide mainly a vertical reaction at the post. In my ledger construction according to the Canadian patent aforesaid, as well as in known ledger constructions, a moment is developed between the point of attachment of the outer end of the ledger and the post as well as the vertical reaction, but reliance is placed mainly upon means used to secure the inner end of the ledger as aforesaid, and any moment at the outer end of the ledger is not considered to make material contribution to support.

OUTLINE OF THE INVENTION

In the present invention, a cantilever clamp is used to secure the ledger to the post so that reliance for support of the inner end adjacent the building is mainly upon the cantilever. This reduces disadvantages of previous scoffolds in which a block is attached to the wall with strength to support the load, often a matter of difficulty and expense particularly when working against a completed wall.

The clamp includes an outer end element of the ledger bearing against an outer surface of the post, together with a ledger bracket having a bearing portion bearing against an inner surface of the post. The end element and the bearing portion are vertically spaced so that, when a load is applied to the ledger, cantilever action is attained. The bracket has a rotatable lever secured thereto, the lever having an engaging plate which is urged against the post outer surface so that material downward movement of the loaded ledger relative to the post is resisted by the engaging plate rotating the lever so urging the post surfaces in locking engagement against the ledger end plate and bracket bearing parts aforesaid, increase of ledger load increasing the locking action. As well as locking engagement, the lever provides a means of quick release, and for ready insertion of the post.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a segmented side elevation of a scaffold structure embodying the invention,

FIG. 2 is a plan detail of an inner end of FIG. 1 adjacent a vertical outer wall of a building,

FIG. 3 is a section on 3—3 of FIG. 1,

FIG. 4 is a fragmented side elevation detail of a clamp according to the invention, parts being broken away better to illustrate the clamping action.

The following description related to the drawings describes preferred embodiment and is given by way of example, the invention not being limited to the particular structure described and illustrated.

DESCRIPTION OF PREFERRED EMBODIMENT

Description of FIGS. 1, 2, and 3

In FIG. 1, the numeral **20** indicates a horizontal ledger secured as a cantilever to a vertical scaffolding post **21**, suitably a 2 x 4. Clamp means indicated generally by the numeral **22**, later described in detail, being used to secure the ledger to the post. A shoe **23** is secured to an inner end of the ledger remote from the point of attachment to the vertical post. The shoe acts as a bearing plate and is secured by nailing to a building outer wall indicated generally by the numeral **24**. A strut **25** is mounted for rotation about a short vertical shaft **26** which shaft is secured, as by welding, to the ledger. It is to be noted that the strut **25** is disposed below the ledger, as best seen in FIG. 1, so that an end **27** of the strut remote from the shaft **26** can be disposed to bear against the building part **24** as seen in FIG. 2, an end **27** of the strut being provided with nailing holes **28**, for nails **29**.

The numerals **30**, **31** and **32** designate studs of the building wall **24**, studs being provided at 16 inch centers as is common building practice. The inner shoe or bearing plate of the ledger **20** is nailed to the stud **31** as indicated at **32**, and the strut **27** is fastened by toe-nailing through to the stud **31**, as seen at **29**. The position at which the shaft **26** is secured to the ledger is not important, but can be for instance 14 to 18 inches from the inner end of the ledger, at 18 inches the strut **25** would be 25 inches long and disposed at 45° to the wall, with the end **27** secured as shown in FIG. 2 by toe-nailing as aforesaid to the next stud. The strut **25** can of course equally well be disposed on a side of the ledger opposite to that shown in FIG. 2 for securing to the stud **32**.

The ledger **20** has parallel side elements **33** and **34**, spaced at their inner ends by the shoe **23**, and at the post **24** by an outer end element **35**, the spacing between the side elements being such as to accommodate the post **24** as best seen in FIG. 3, with the outer end element engaging an outer side of the post.

Suitably the side members and end member can be formed of a single strip bent in elongated U-shape, and intermediate spacing members **34.1** can be secured between the side members as shown, for rigidity.

Description of FIG. 4

The clamp means generally indicated by the numeral **22**, FIG. 1, is shown in detail in FIG. 4, the clamp having

a lever **41** rotatable of a short horizontal shaft **42**, suitably a bolt, of a bracket **43**. The bracket has an inwardly disposed arm **44** extending to and passing between the ledger side elements **33** and **34**, and secured to inner edges of the said members suitably by welding. The bracket **43** has a member **45** generally at right angles to the inwardly disposed arm **44** aforesaid, the right angled member having a curved end **46**, a convex outer surface of which is designated **47**. The curved end **46** also extends between and is secured to inner side walls of the ledger side elements **33**, **34**, and is disposed so that the said surface **47** is spaced from the outer element **35** by a distance such as freely to admit the 2 x 4 post **21** as seen.

The inwardly disposed arm **44** has, at an end thereof remote from the ledger, a curved U-shaped bearing portion indicated by the numeral **48** in such a position that, when the ledger **20** is horizontal and the post **21** vertical, an inner surface of the outer element **35** bears against an outer side **49** of the post, with an inner side of the post being in contact with the bearing portion of the U-shaped element as indicated by the numeral **50**, the lever being rotatably mounted, as aforesaid, to the bracket adjacent the bearing portion **50**. It is important to note that the bearing portion **50** is spaced vertically below the element **35** by a distance which is a moment arm of the cantilever couple, as is further discussed.

An outer end of the lever **41** has an opening through which the post **21** passes, the said opening being defined in part by an engaging plate **54** so that an inner corner **55** defined by an inner surface **56** of the engaging plate and an upper side edge wall **57** thereof bears against the outer side **49** of the post **21** as shown. Spring means **55.1** are provided normally to urge the lever in a clockwise direction (clockwise as viewed in FIG. 4) so that the corner **55** is urged against the contiguous post side wall aforesaid.

OPERATION

In use, a scaffolding is erected by using a plurality of posts and ledgers disposed as shown in FIG. 1 and FIG. 2, planks **58** seen in FIG. 1 only, being laid across and supported by the ledgers in an ordinary way.

When a ledger is loaded, disregarding any vertical reaction at the attachment of the ledger to the side wall, the ledger is effectively a cantilever maintained in a horizontal position by a moment applied, see FIG. 3, at the outer end plate **35** and the point of contact **50** aforesaid. There would also be a tendency, upon initial loading, to urge the ledger downwards of the post **21**. In these circumstances it is seen that the corner **55** of the lever **41** would bite into the outer surface of the post tending to rotate the lever further clockwise, urging the post more firmly in engagement with the element **35** and the point of contact **50**. The greater the vertical load, the greater this effect becomes. Hence there is, after the initial bite, positive restraint of the ledger to resist vertical motion relative to the post, and cantilever attachment of the ledger to the post.

While there will be some additional strength developed at the point of attachment of the inner end of the ledger to the wall studding, a principal effect of the attachment of the ledger to the stud is to maintain the post in a spaced position relative to the wall, and the strut **25** acts mainly as a sway brace. The scaffolding may be easily struck by rotation of the lever **41** in a counter clockwise direction as seen in FIG. 4, this will release the ledger from engagement from the post.

The construction has been described in relation to a 2 x 4 post, and can obviously be adapted for use with tubular post members. Where the scaffold is to be used with structure such that nailing to wall studs cannot well effected, or in construction where there are no wall studs, the ledger and brace ends can be nailed to obvious block means temporarily secured to the wall. It is seen that, even though a block might be used, the block mainly effects spacing, thus need only be lightly secured to the wall since the reaction at the block is essentially axial of the ledger.

I claim:

1. In scaffold adapted for erection to a wall, a ledger having cantilever means of attachment to a vertical post, the ledger being characterized by:

(a) an outer end element of the ledger adapted to engage an outer side of the post;

(b) a bracket having an end member, the end member being secured in the ledger and spaced from the outer end element for free admission of the post; and a bracket bearing portion engaging an inner side of the post and spaced below the outer end element by a distance defining a moment arm;

(c) a lever rotatably mounted to the bracket adjacent the bearing portion thereof; an engaging plate at an outer end of the lever adapted for an inner corner thereof to engage the outer wall of the post, the lever sloping downwards in a direction from the outer end towards the building wall; constructed and arranged so that tendency of the ledger to move downwards of the post tends to rotate the lever urging the inner corner against the post outer wall, resisting downward movement of the ledger relative to the post.

2. Structure as defined in claim **1**, an inner end of the ledger having an inner shoe for attachment to a wall of the building against which the scaffold is erected.

3. Structure as defined in claim **2**, and sway brace means having an inner end pivoted to the ledger swingable thereof, and an outer end adapted for attachment to the wall.

4. Structure as defined in claim **1**, the bracket bearing portion being convex and spaced below a point at which the lever is rotatably mounted as aforesaid, the inner corner of the lever being disposed between the ledger and the point of rotatable mounting, and spring means urging the inner corner of the lever against the post outer wall.

5. Structure as defined in claim **2**, the bracket bearing portion being convex and spaced below a point at which the lever is rotatably mounted as aforesaid, the inner corner of the lever being disposed between the ledger and the point of rotatable mounting, and spring means urging the inner corner of the lever against the post outer wall.

6. Structure as defined in claim **3**, the bracket bearing portion being convex and spaced below a point at which the lever is rotatably mounted as aforesaid, the inner corner of the lever being disposed between the ledger and the point of rotatable mounting, and spring means urging the inner corner of the lever against the post outer wall.

7. Structure as defined in claim **1**, the ledger having side elements spaced to accommodate the post, the outer end element being secured between the side elements; the end member of the bracket being secured between the spaced side elements; the lever bearing portion being U-shaped.

8. Structure as defined in claim **4**, the ledger having side elements spaced to accommodate the post, the outer end element being secured between the side elements; the end member of the bracket being secured between the spaced side elements; the lever bearing portion being U-shaped.

9. Structure as defined in claim **6**, the ledger having side elements spaced to accommodate the post, the outer end element being secured between the side elements; the end member of the bracket being secured between the spaced side elements; the lever bearing portion being U-shaped.

10. Structure as defined in claim **9**, the sway brace means being pivoted on a shaft secured beneath the ledger to be swingable to either side thereof.

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U.S. Cl. X.R.

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