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QUICK DETACHABLE HOOK

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2 Sheets-Sheet 1

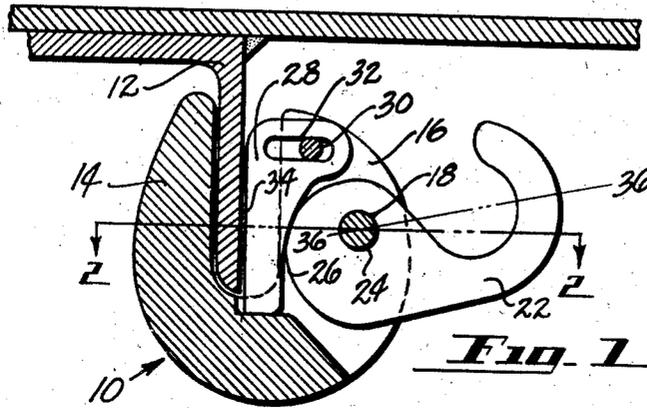


Fig. 1

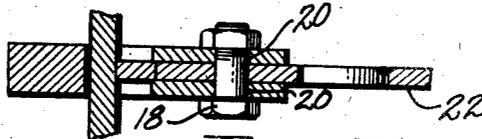


Fig. 2

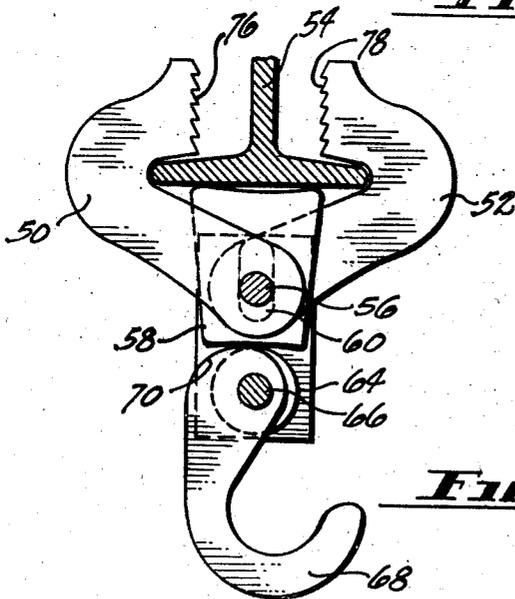


Fig. 3

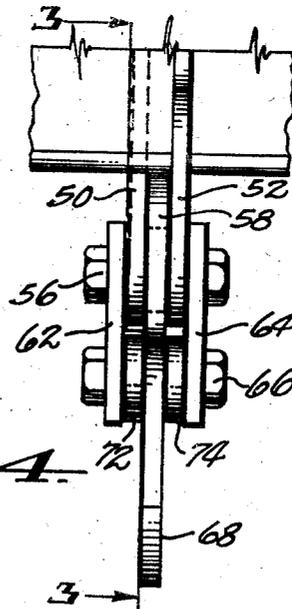


Fig. 4

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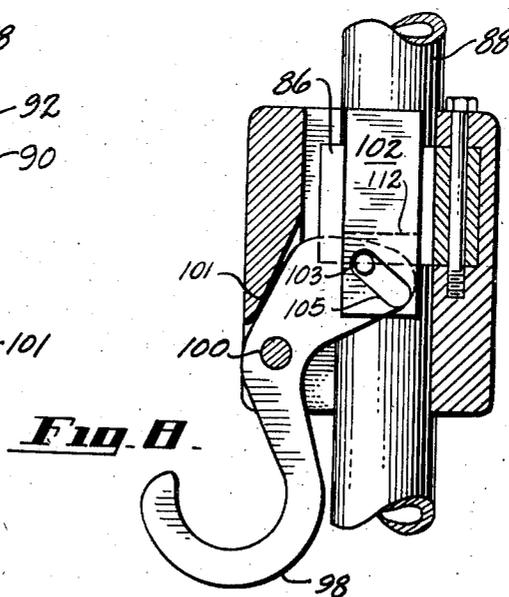
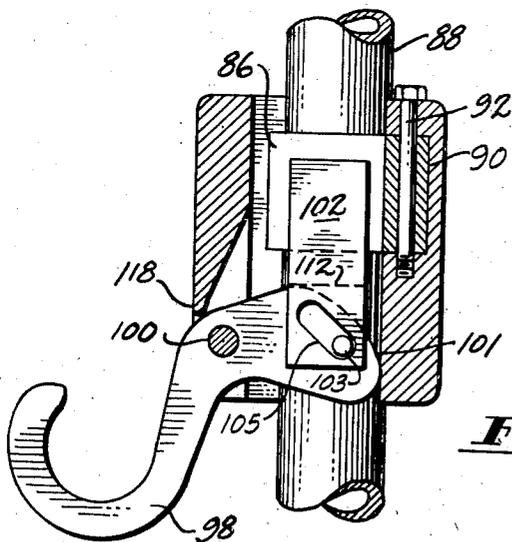
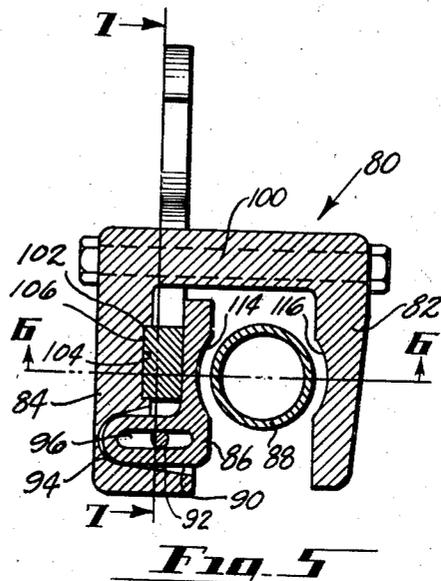
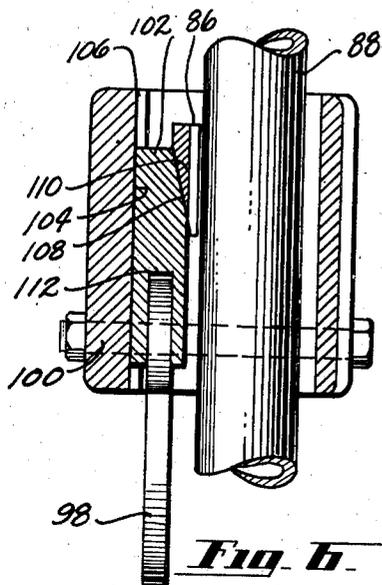
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2 Sheets-Sheet 2



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QUICK DETACHABLE HOOK

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14 Claims. (Cl. 248—228)

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This invention relates to a quick detachable, load carrying hook primarily adapted for use where temporary support is needed. One of its principal uses is the temporary support of electrical wiring. It is also extremely suitable for attachment of block and tackle, chain hoists, and the like where quick attachment and detachment are desired.

In building construction work in general and particularly in the construction of steel ships it has been customary to use various makeshift methods of supporting electrical wiring temporarily until such time as the permanent electrical installation is completed and put into operation. One of the more usual makeshift arrangements is to bend up a hook from a piece of rod or strap iron and weld it in position on a convenient angle-iron, channel or bulkhead. When the work is completed, it is then necessary to remove all such hooks as a matter of safety since they frequently extend into passageways where they constitute hazards.

Since these connections are of a permanent nature it is not easy to remove them. They must be broken or chipped off or burned away with a cutting torch, and the resulting surface must be ground smooth with another tool and perhaps specially painted for protection against corrosion. These operations are time consuming and expensive and usually require a separate inspection to ascertain that all work is properly completed.

The supporting hook disclosed herein obviates all of the difficulties set forth above. It can be installed instantly in any location and will support a load as satisfactorily as any permanently attached hook. It can be easily adjusted to a new position if necessary or desirable, for instance during painting of the structure, and it can be removed instantly when it has served its purpose. Its unique gripping arrangement provides firm anchorage at all times without possibility of marring or otherwise injuring the surface of the supporting structure, and it can be detached and re-used indefinitely because no parts are cut or broken in the process.

The hook of this invention, in its various forms, is adapted to be readily attached to projecting edges of bulkheads or angles, to steel or wood overhead beams, or to vertically arranged rods or pipes. A firm grip is obtained whether the surfaces of the support are parallel or at an angle to each other and, within limits, regardless of the exact dimensions of the support. Increase in load increases the gripping

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action so that the connection is always adequate for the load supported.

The principal object of the invention is to provide a load supporting hook having the characteristics outlined above. Other and further objects will become apparent as the description proceeds.

The preferred forms of the invention are illustrated in the accompanying drawings in which:

Fig. 1 is a side elevational view partly in section, showing the primary form of the invention in gripping relation with a narrow elongated supporting member;

Fig. 2 is a sectional view taken along the line 2—2 of Fig. 1;

Fig. 3 is a side elevational view, with a portion removed, taken along the line 3—3 of Fig. 4, of a modified form of hook especially adapted for attachment to an overhead beam of steel or wood;

Fig. 4 is a side elevational view taken at right angles to the view in Fig. 3;

Fig. 5 is a horizontal sectional view thru another modified form of the invention which is particularly adapted for attachment to an elongated vertical support such as a pipe or stanchion;

Fig. 6 is a vertical sectional view taken along the line 6—6 of Fig. 5;

Fig. 7 is a vertical sectional view taken along the line 7—7 of Fig. 5, showing the parts in initial position before the load is applied and the gripping action takes place; and

Fig. 8 is a view similar to Fig. 7, but showing the parts in final position after a load is applied and the clamping shoe has moved into gripping engagement with the support.

Referring now to Fig. 1, the hook, which is generally indicated by the reference character 10, is shown in gripping relation with an overhead support 12, here illustrated as a typical angle iron. The main body portion of the device consists of a U-shaped member having legs 14 and 16, the latter being bifurcated as shown in Fig. 2 to provide a guide and supporting slot in the general plane of the member.

A pin or bolt 18 passes thru aligned holes 20 in leg 16 and serves as a journal for the load supporting hook 22. The hook is provided with a bore 24 adapted to bear on the pin. The hook is further provided with a cam surface 26 adapted to bear against one edge of the clamping shoe 28 to force it leftwardly toward leg 14 and into gripping engagement with one surface of the support 12. The shoe is guided and restrained

in its movement by virtue of its location between the bifurcated jaws of leg 16 and further by pin 30, which is adapted to engage in a slot 32 formed near one end of the shoe.

It will be noted that, while the shoe as a whole moves bodily toward jaw 14, it is capable of limited angular movement so that its gripping face 34 will engage the support 12 thruout its length whether the two faces of the support are parallel or angularly divergent. Because of this unique feature the gripping force is distributed over a relatively large area, thus reducing danger of slipping or marring of the support to a minimum. This is highly desirable where the support surface is already painted or is composed of a material, such as glass, which is subject to abrasion or breakage if concentrated loads are applied.

The load line 36—36 of the hook 22 is so related to the cam surface 26, as seen in Fig. 1, that the same gripping action can still be obtained if the hook is attached to a support the plane of which is generally horizontal. Thus the hook can be said to be adapted to operate under load angles varying thru a range of about 90 degrees. Moreover, by removing pin 18 and reversing the hook 22 with respect to the body member the device is equally adapted to engage a support whose free edge extends upwardly instead of downwardly.

The same basic principles of operation appear in the modified form of the invention shown in Fig. 3. In this form gripping members 50 and 52 are adapted to engage the edges of a horizontal overhead support such as the I beam 54. These members are joined in pivotal relation by a pin or bolt 56. The clamping shoe 58, provided with an elongated slot 60, is arranged between the gripping members and carried on the pin 56 for movement toward and away from the support 54.

A pair of side plates 62 and 64 are also carried by pin 56 and, near their lower ends, are provided with a bearing pin 66 supporting the load carrying hook 68 for pivotal movement. Hook 68 is provided with a cam surface 70 at one end, similar to Fig. 1, which is adapted to engage an edge of shoe 58 and force it into contact with the support when the hook is swung around its pivot. Spacing washers 72, 74 are provided on pin 66 to prevent undue lateral movement of the hook and prevent disengagement of the cam from the clamping shoe.

It will be seen that the arms of the gripping members extend at angles of about 45 degrees to the axis of symmetry of the device. Consequently, when the clamping shoe exerts a force along said axis the gripping members exert not only an opposite force but also a force at right angles thereto so that the members are urged toward each other as the load is applied. This provides added safety and is of particular importance when the hook is used to support chain hoists carrying heavy loads.

The free ends of the members 50 and 52 are provided with serrations 76 and 78 to adapt the device for attachment to wooden beams which normally have substantially parallel sides. The angular relation of the hooks will provide adequate lateral forces and the form of the serrations will prevent any possibility of slipping.

Figs. 5 to 8 illustrate a form of the invention which is particularly suitable where the support to be engaged is a slender, vertically extending column, such as a pipe or stanchion. In such circumstances it is necessary for the hook to swing

in one plane and the clamping shoe to move in another plane at right angles to the first plane. The body member 80 is provided with a pair of rigid legs 82 and 84. Clamping shoe 86, movably carried by leg 84, is adapted to cooperate with leg 82 in gripping the support 88. Leg 84 is provided with a recess 90 traversed by a guiding and restraining pin 92 for the reception and retention of the lateral extension 94 of the clamping shoe. An elongated slot 96 in the extension, in which pin 92 is engaged, allows for limited movement of the shoe.

The hook 98 is pivotally attached to the body member by means of a pin 100 and is provided with a cam surface 101 for engagement with wedge block 102. The latter is a member of generally rectangular cross-section having a surface 104 adapted for engagement in a guide channel 106 formed in the inner face of leg 84. A portion of the face of the wedge block opposite surface 104 is beveled, as shown at 108 for engagement with the complementary surface 110 of the clamping shoe. Upward movement of the block, as seen in Fig. 6, will cause the shoe to move toward the right, into contact with support 88. To provide for this movement the lower end of the block is bifurcated to provide spaced jaws and a force transmitting surface 112. The cam portion 101 fits between the jaws and engages surface 112 so that pivotal movement of the hook will urge the block upward, causing shoe 86, in cooperation with leg 82, to grip the support. The shoe and the leg are provided with arcuate concavities 114 and 116 to facilitate gripping cylindrical supports. The flat portions are, of course, well adapted to engage supports having substantially parallel sides. Pin 103, carried by the cam portion, engages loosely in slots 105 in the wedge block and is adapted to pull the block downwardly to release it on reverse movement of the hook.

When the hook is not in use the block 102 is prevented from escaping upward by the shoe 86 which cannot move far enough to the right to allow it to slip by. It is prevented from escaping downward by contact with the cam portion 101, the movement of which is limited by engagement of the mid-section of the hook with stop 118. The pin and slot connection 103, 105 also prevents separation.

The principal advantages and features of novelty have been pointed out above with respect to the preferred forms of the invention. However it is to be understood that various changes and modifications may be made by those skilled in the art and it is intended that all such changes and modifications shall be considered a part of this invention so far as they fall within the scope of the attached claims.

I claim:

1. A hook adapted for attachment to a support comprising: at least one member having a surface adapted to engage one side of a structure; a clamping shoe carried by said member, capable of limited linear displacement toward and away from said surface and adapted to pressurally change a second side of said structure; and a load member pivotally attached to said member and provided with means to force said shoe into clamping engagement with said structure upon pivotal movement of said load member.

2. A device as claimed in claim 1, in which said member and said shoe are provided with interengaging guide means adapted to direct said shoe in its linear movement.

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3. A device as claimed in claim 1, in which said member is provided with a guide pin and said shoe is provided with a guide slot in which said pin is engaged, to direct and limit said shoe in its linear movement.

4. A device as claimed in claim 1, in which the means to force said shoe into clamping engagement includes a cam surface bearing directly against one face of said shoe.

5. A hook adapted for attachment to a supporting structure comprising: a U-shaped member, one leg of which is provided with means for engaging a support; a clamping shoe carried by said member for bodily displacement toward and away from said engaging means and into and out of contact with said support; and a load supporting hook pivotally mounted on said member and provided at one side of its pivotal axis with a load engaging portion and at the other side with a portion adapted to engage one surface of said shoe and urge it into contact with said support upon pivotal movement of said hook.

6. A device as claimed in claim 5 in which the second mentioned portion of said hook is provided with a cam surface adapted for sliding engagement with said shoe.

7. A device as claimed in claim 5 in which the second leg of said U-shaped member is provided with a slot in the plane of its greater dimensions, dividing said leg into a pair of jaws; and said shoe and said hook are mounted between said jaws.

8. A hook adapted for attachment to a supporting structure comprising: a pair of support engaging members pivotally connected together, the free ends being adapted to move toward each other to grip a support between them; a clamping shoe carried by said members for movement toward and away from said support; a link carried by said members; and a load carrying hook pivotally mounted on said link and provided with a surface engaging said shoe to force it into contact with said support upon pivotal movement of said hook.

9. A device as claimed in claim 8, in which a pin provides the pivotal connection between said support engaging members and said shoe is provided with a slot arranged in the direction of bodily movement of said shoe, said pin passing thru said slot and maintaining said shoe in assembled relation with said members.

10. A hook adapted for attachment to a supporting structure comprising: a U-shaped member, the inner surface of one leg of which is

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adapted for engagement with a support; a clamping shoe carried by the other leg for movement toward and away from said first leg and into and out of contact with said support; and a load carrying hook pivotally mounted on said member and provided with means moving in a plane at right angles to said shoe and adapted to force it into contact with said support.

11. A device as claimed in claim 10, in which said means includes a wedge block in slidable engagement with a surface of said shoe.

12. A device as claimed in claim 10, in which said means includes a wedge block in slidable engagement with a surface of said shoe and a cam surface on a portion of said load carrying hook arranged in force transmitting relationship with a part of said wedge block.

13. A hook adapted for attachment to a supporting structure comprising: a U-shaped member, the inner surface of one leg of which is adapted for engagement with a support; a guide surface formed on the inner surface of the other leg of said member; a clamping shoe carried by said other leg for movement toward and away from said first leg and into and out of contact with said support; a wedge block having a guide portion on one side in engagement with the guide surface on said leg and having an angular face on the opposite side for sliding engagement with said clamping shoe; the movement of said wedge block being at right angles to the movement of said shoe; and a load carrying hook pivotally mounted on said member and adapted on pivotal movement to urge said wedge block into wedging relationship with said shoe.

14. A device as claimed in claim 13, in which said wedge block is provided with a bifurcated end and a portion of said hook is located within said bifurcation.

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Certificate of Correction

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June 24, 1947.

JAMES I. TUCKER

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Column 4, line 66, claim 1, for "change" read *engage*; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 26th day of August, A. D. 1947.

[SEAL]

LESLIE FRAZER,
First Assistant Commissioner of Patents.