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3,289,991

SUPPORT FIXTURE

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Fig. 1.

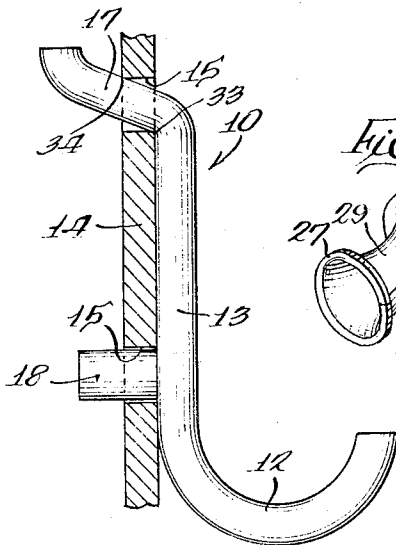


Fig. 4.

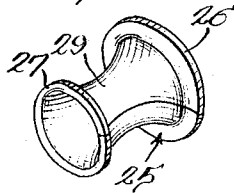


Fig. 2.

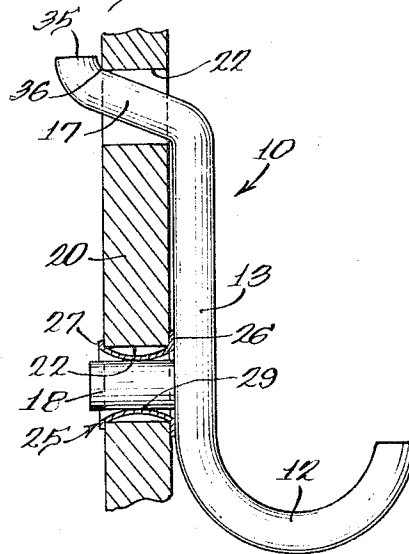


Fig. 5.

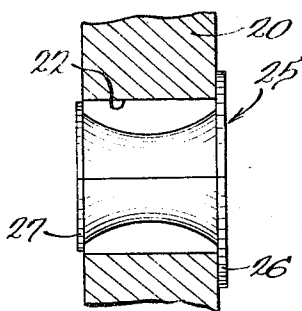


Fig. 3.

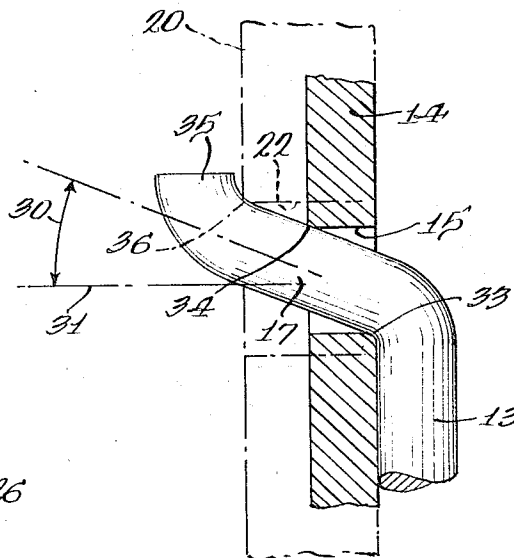
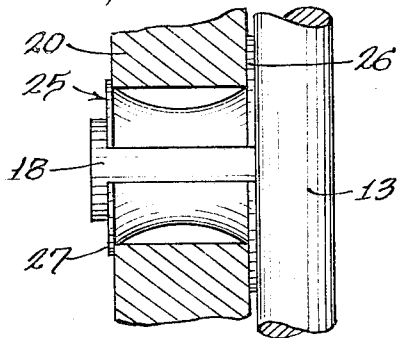


Fig. 6.



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SUPPORT FIXTURE

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10 Claims. (Cl. 248—225)

This invention relates generally to support fixtures, and more particularly to a supporting fixture adapted to be mounted in a perforated board.

Perforated fiber board is used extensively to store or display various articles. For this purpose, various supporting fixtures have been provided in the past which fit within the perforations in the board and have a projecting hook or bracket upon which the article is supported. In order to properly support the article, it is important that the fixtures themselves be securely mounted to the perforated board.

These prior fixtures generally have one or more projections which extend into the perforations in the board and have upturned portions to maintain them therein. Standard perforated fiber board is manufactured in both $\frac{1}{4}$ inch and $\frac{1}{8}$ inch sizes. While the perforations or holes are the same distance from one another in both standard designs, the holes in the $\frac{1}{4}$ inch board are nominally $\frac{1}{4}$ inch (actually $\frac{3}{32}$ inch) while the holes in the $\frac{1}{8}$ inch board are nominally $\frac{1}{8}$ inch (actually $\frac{3}{16}$ inch). The differences in these standard boards have created difficult problems in the design of a suitable support fixture. Certain prior supporting fixtures of this type have been devised which will securely lock in the $\frac{1}{8}$ inch board, while certain other fixtures have been devised which will securely lock in the $\frac{1}{4}$ inch board. Still another prior supporting fixture has been provided which fits in both the $\frac{1}{4}$ inch and $\frac{1}{8}$ inch board. But this latter construction fits loosely in both boards and therefore provides a poor support.

In accordance with the present invention, a supporting fixture is provided which not only fits in both the $\frac{1}{4}$ inch and $\frac{1}{8}$ inch board, but which also securely locks in each. An article supporting hook is provided with two rearwardly extending projections. One of the projections is sized to snugly fit within the $\frac{1}{8}$ inch board perforations. When it is desired to use the hook on $\frac{1}{4}$ inch board, an expandable adapter is provided which receives the lower projection and expands securely locking it in the $\frac{1}{4}$ inch perforations. Another projection is provided on the supporting hook for fitting into an adjacent perforation. This projection is shaped so that it engages the edges of both the $\frac{1}{4}$ inch and $\frac{1}{8}$ inch board perforations thereby securely locking the supporting fixture in position.

It is, therefore, a primary object of the present invention to provide a new and improved article supporting fixture for a perforated board which is designed to fit and lock in different thickness boards having different diameter perforations therein.

Another object of the present invention is to provide a new and improved article supporting fixture of the type described above which has two rearwardly extending projections, one of which is sized to snugly fit within the smaller perforated board and which is insertable within an expandable sleeve for use in the larger perforated board.

A further object of the present invention is to provide a new and improved article supporting fixture of the type described above and further including a second projection extending rearwardly from the article supporting member having an angular relationship with the perforations so that it engages the sides of the perforations in both the $\frac{1}{4}$ inch and $\frac{1}{8}$ inch boards thereby securely locking the supporting device to either perforated board.

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Other objects and advantages will become readily apparent from the following detailed description taken in connection with the accompanying drawings in which:

FIG. 1 is a side elevation of the present article supporting fixture shown mounted in a $\frac{1}{8}$ inch perforated board illustrated in section;

FIG. 2 is a side elevation of the present article supporting fixture shown mounted in a $\frac{1}{4}$ inch board illustrated in section;

FIG. 3 is an enlarged fragmentary view of the upper projection on the present supporting fixture illustrating its relationship with the receiving opening in a $\frac{1}{8}$ inch board shown in cross-section, and a $\frac{1}{4}$ inch board shown in dotted lines;

FIG. 4 is a perspective view of the resilient spring adapter;

FIG. 5 is an enlarged elevation view of the resilient spring adapter in its relaxed position within an aperture in a $\frac{1}{4}$ inch board; and

FIG. 6 is an enlarged elevation of the spring adapter with the lower fixture projection inserted therein.

While this invention is susceptible of embodiment in many different forms, there is shown in the drawings and will herein be described in detail an embodiment of the invention with the understanding that the present disclosure is to be considered as an exemplification of the principles of the invention and is not intended to limit the invention to the embodiment illustrated. The scope of the invention will be pointed out in the appended claims.

Referring now to the drawing, wherein a supporting fixture 10 is provided including a rod-like hook 12 having an upwardly extending straight leg 13 adapted to engage the outer surface of a perforated board 14. The board 14, as shown in FIG. 1, is a standard $\frac{1}{8}$ inch perforated board having a plurality of holes 15 therein which are approximately $\frac{3}{16}$ inch in diameter. The upper end of the straight leg portion 13 is bent rearwardly and defines a projection 17 adapted to fit within the upper opening 15 of the board 14. Adjacent the lower end of straight portion 13 is another rearwardly extending cylindrical projection or stud 18 fixed thereto as by welding. The lower stud 18 fits within an aperture adjacent to the one that the upper projection fits in. It should be noted here that the stud 18 is sized so that it fits snugly within the apertures in the $\frac{1}{8}$ inch board without the adapter, and thus, has a diameter of approximately .177".

As shown in FIG. 2, the present supporting fixture 10 is also constructed to fit and lock within a $\frac{1}{4}$ inch board 20. These boards are constructed in standard form and have a plurality of holes 22 therein which have a diameter of approximately $\frac{3}{32}$ inch.

To securely fit the fixture 10 in a $\frac{1}{4}$ inch perforated board a spring adapter 25 is provided into which the lower projection or stud 18 is insertable. As shown in FIG. 4, the spring steel adapter is seen to be a rolled, split sleeve member with a forward flange 26, a rearward flange 27, and a necked down central portion 29.

As shown more clearly in FIG. 5, the spring adapter when relaxed is freely insertable within any of the apertures 22 in the $\frac{1}{4}$ inch board 20. The forward flange 26 is larger than the diameter of hole 22 so that the adapter may not be pushed entirely through the hole 22. The rear flange when the adapter 25 is relaxed is slightly smaller than the bore 22 to permit the insertion of the adapter in the hole.

The inside diameter 30 of the adapter 25 adjacent the central portion 29 thereof, as shown in FIG. 2, is less, when relaxed, than the outer diameter of the stud or projection 18. The reason for this is that when the projection is inserted within the adapter 25, the adapter will expand and engage the hole 22 as shown in FIG. 6.

Furthermore, when expanded, the flange 27 is sized so that it has a greater diameter than the bore 22. As the adapter 25 is constructed of spring steel, and is tensioned when the projection 18 is inserted therein, it in effect clamps against the projection 18 and securely fastens the hook member to the board. Thus, the stud 18 is rigidly and securely prevented from movement either radially or axially.

As clearly illustrated in FIG. 3, the upper projection 17 is formed so that it engages the bores in both the $\frac{1}{4}$ inch and $\frac{1}{8}$ inch boards, thus preventing any looseness in the fixture 10. For this purpose, the projection 17 preferably extends at an angle designated 30 of approximately 22 degrees with respect to a plane 31 perpendicular with respect to the board. Plane 31 is, also, perpendicular with respect to the plane defined by the projection 17 and straight portion 13. While projection 17 preferably extends at a 22 degree angle with respect to this plane, the desirable advantages thereof are apparent in varying extents from a range of 18 to 26 degrees. When mounted in the $\frac{1}{8}$ inch board 14, the upper projection 17 engages hole 15 at points 33 and 34 thereby securely locking the upper end of the fixture in the board, particularly in cooperation with the stud 18 which as noted above fits snugly in holes 15. The portion of the projection 17 that engages the one eighth inch board perforations at point 34 is spaced the thickness of the one eighth inch board 14, i.e., nominally one eighth inch, from the line of engagement between the straight portion 13 of the support member and the board 14 in a plane perpendicular to such line of engagement. This portion of the projection 17 is spaced a distance equal to the centerline spacing between perforations from the upper surface of the projection 18 to snugly fit the projections 17 and 18 within the perforations in the smaller one eighth inch board.

When used with the $\frac{1}{4}$ inch board 20, the angular projection 17 engages the upper edge of hole 22 at point 36 thereby preventing any play in the upper portion of the fixture when it is used in the $\frac{1}{4}$ inch boards. The portion of the projection 17 that engages the one quarter inch board perforations at 36 is spaced the thickness of the one quarter inch board, i.e., nominally one quarter inch, from the line of engagement between the straight portion 13 and the support member and the board 14 in a plane perpendicular to such line of engagement. This portion of the projection 17 is spaced approximately one half the diameter of the projection 18 further from the upper surface of the projection 18 than the portion of the projection 17 that engages the one eighth inch board at 34 is spaced therefrom, and in this manner the projections 17 and 18 fit snugly within the perforations in the larger one quarter inch board. Of course, the adapter 25 is necessary to maintain this contact in the $\frac{1}{4}$ inch board. The projection 17 may have an upturned portion 35, if desired, to assure contact at point 36.

In use, with $\frac{1}{8}$ inch boards the fixture 10 without the adapter is mounted thereon by inserting the projection 17 through a hole 15 and then rotating the hook 12 downwardly forcing the stud 18 into an adjacent aperture 15 where it snugly fits therein. The frictional engagement between stud 18 and aperture 15 maintains the upper projection 17 in engagement with its associated bore at points 33 and 34, as shown in FIG. 3.

In use with a $\frac{1}{4}$ inch board, the adapter 25 is inserted relaxed within a selected aperture 22. Thereafter, the projection 17 is inserted within an adjacent aperture and again the hook is rotated downwardly, and the lower stud 18 is forced into the adapter 25. The adapter expands gripping the projection and the perforated board in the manner described above. This maintains the upper projection 17 in engagement with its associated aperture at point 36, thereby securely locking the fixture in position.

It is apparent from the foregoing that the present device provides a supporting fixture which in accordance with

the objects of the present invention is adaptable to be mounted in both $\frac{1}{4}$ inch and $\frac{1}{8}$ inch perforated boards and to lock securely in both.

I claim:

1. A supporting fixture adapted to be mounted in two different sized perforated boards, the larger board having a thickness of approximately one quarter inch and perforations of approximately one quarter inch and the smaller board having a thickness of approximately one eighth inch and perforations of approximately one eighth inch, comprising: an article supporting member, a projection extending from said member and adapted to be mounted centrally in a perforation of either the smaller or the larger board, said projection having a width approximately that of the smaller sized perforations, a removable adapter surrounding said projection for increasing the effective width thereof so that said projection fits snugly within a perforation of the larger board, and a second projection extending from said supporting member adapted to be fitted within a perforation in either the smaller or the larger board, said second projection being angularly disposed with respect to the perforations so that it snugly fits in either the smaller or larger perforations.

2. A supporting fixture as defined in claim 1, wherein said adapter is a resilient sleeve member, the relaxed outer diameter of said adapter being less than the larger perforations, the relaxed inner diameter of the adapter being less than the width of the first projection, the extended diameter of said adapter when engaging said first projection being at least that of the larger diameter perforations.

3. A supporting fixture as defined in claim 2, wherein said adapter is a radially expandable resilient sleeve spring, a flange on one axial end of the spring having a greater diameter than the larger perforations, a second flange on the other end of said spring having a relaxed diameter slightly smaller than the larger perforations, whereby the adapter is inserted relaxed in a larger perforation and thereafter the first projection is inserted into the adapter to snugly support the first projection therein.

4. A supporting fixture as defined in claim 1, wherein said second projection defines an angle of approximately twenty-two degrees with a plane extending perpendicular to the board whereby the second projection snugly engages the perforations in either the smaller or the larger board.

5. A supporting fixture as defined in claim 1, wherein said second projection defines an angle in the range of eighteen to twenty-six degrees with a plane extending perpendicular to the board, whereby the second projection fits snugly in either the smaller or larger perforations.

6. A supporting fixture adapted to be mounted in two different sized perforated boards, the larger board having a thickness of approximately one quarter inch and perforations of approximately one quarter inch and the smaller board having a thickness of approximately one eighth inch and perforations of approximately one eighth inch, comprising: a rod-like hook member for supporting an article, said hook member having an upwardly extending straight leg adapted to abut the surface of a perforated board, a lower cylindrical projection extending from the lower end of said straight portion and being substantially perpendicular thereto, said lower projection having a diameter substantially equal to the small board perforation so that said projection snugly fits therein, a radially expandable sleeve surrounding said lower projection for increasing the effective diameter thereof so that said lower projection will fit snugly in the perforations of the larger board, said sleeve having a relaxed inside diameter less than said lower projection so that it expands when the projection is inserted therein, a second cylindrical projection extending outwardly from the upper end of said straight portion, said second projection being coplanar with said straight portion and said first projection, said second projection defining an angle of approximately twenty-two degrees with a plane perpendicular to the surface of the board and perpendicular to the coplanar plane,

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whereby the second projection will lock in either the small or large perforations.

7. A supporting fixture as defined in claim 6, wherein said sleeve has a flange at one end thereof having an outer diameter greater than the larger perforations, and a second flange at the other end thereof slightly smaller than the larger perforations when the sleeve is relaxed, said second flange being sized so that it expands to a diameter greater than the larger perforations when the first projection is inserted therein.

8. A supporting fixture adapted to be mounted in two different sized perforated boards, the larger board having a thickness of approximately one quarter inch and perforations of approximately one quarter inch and the smaller board having a thickness of approximately one eighth inch and perforations of approximately one eighth inch, comprising: an article supporting member, a projection extending from said member and adapted to be mounted centrally in a perforation of either the smaller or the larger board, said projection having a width approximately that of the smaller sized perforations, a removable adapter surrounding said projection for increasing the effective width thereof so that said projection fits snugly within a perforation of the larger board, and a second projection extending from said supporting member adapted to be fitted within a perforation in either the smaller or the larger board, said second projection having a first portion thereof spaced substantially one eighth inch from said article support member engageable with the edge of the smaller perforations at the side of the smaller board opposite said support member, said second projection having a second portion thereof spaced substantially one quarter inch from said article support member engageable with the larger perforations at the side of the larger board opposite said support member, said second portion being spaced further from said first projection than said first portion is spaced therefrom.

9. A supporting fixture as defined in claim 8 wherein said first and second portions are defined by a straight cylindrical portion on said second projection angularly related with respect to said support member, said straight portion extending rearwardly from said support member a distance equal to at least twice the width of the first projection in a plane transverse to said support member.

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10. A supporting fixture adapted to be mounted in two different sized perforated boards, the larger board having a thickness of approximately one quarter inch and perforations of approximately one quarter inch and the smaller board having a thickness of approximately one eighth inch and perforations of approximately one eighth inch, comprising: an article supporting member, a projection extending from said member and adapted to be mounted centrally in a perforation of either the smaller or the larger board, said projection having a width approximately that of the smaller sized perforations to snugly fit therein, a removable adapter surrounding said projection for increasing the effective width thereof so that said projection fits snugly within the perforations of the larger board, and a second projection extending from said supporting member adapted to be fitted within perforations in either the smaller or the large board, said second projection having a first portion thereof spaced substantially the width of said first projection from said article supporting member and spaced from said first projection a distance substantially equal to the spacing between perforations for engaging the smaller perforations at the side of the smaller board opposite said supporting member, said second projection having a second portion spaced substantially twice the width of said first projection from said article support member and spaced substantially one half the width of said first projection further from said first projection than said first portion is spaced therefrom for engaging the larger perforations at the side of the larger board opposite said supporting member.

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