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SHELF SUPPORT MOUNTING ARRANGEMENT

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Fig. 1.

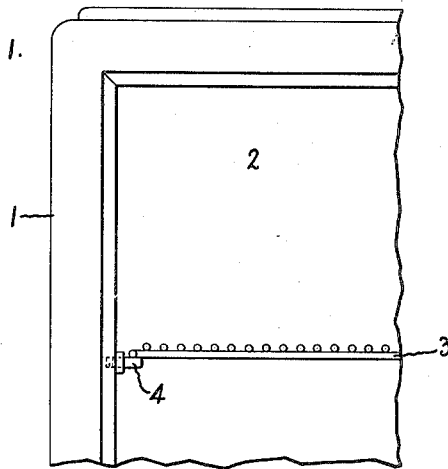


Fig. 2.

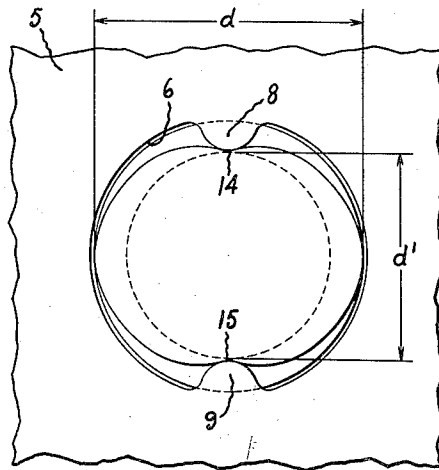
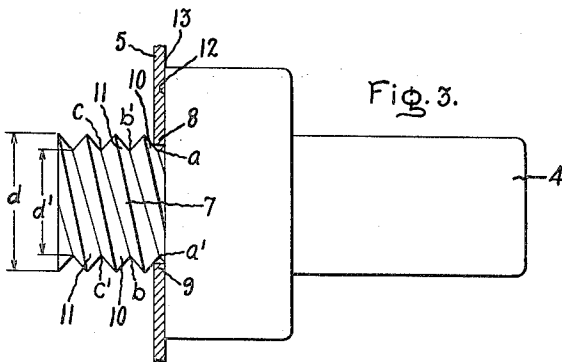


Fig. 3.



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SHELF SUPPORT MOUNTING
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2 Claims. (Cl. 248—239)

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My invention relates to shelf supporting structures and, more particularly, to arrangements for removably mounting shelf supporting structures.

It is an object of my invention to provide an improved shelf supporting structure and mounting arrangement therefor.

It is another object of my invention to provide a shelf supporting structure wherein the opening for receiving the shelf support may be easily formed in a wall or panel and wherein the shelf support may be easily assembled in the opening.

Further objects and advantages of my invention will become apparent as the following description proceeds and the features of novelty which characterize my invention will be pointed out with particularity in the claims annexed to and forming part of this specification.

In carrying out the objects of my invention, an opening having a plurality of inwardly extending arch-like projections is provided in a wall or panel to which a shelf supporting stud is to be attached, and a shelf supporting stud is employed which includes a corresponding number of parallel threads.

For a better understanding of my invention, reference may be had to the accompanying drawing in which Fig. 1 is a view of a portion of a refrigerator illustrating an embodiment of my invention; Fig. 2 is an enlarged end elevation view of the shelf support mounting assembly shown in Fig. 1; and Fig. 3 is a side elevation view of the assembly shown in Fig. 2.

Referring to the drawing, there is shown a portion of a refrigerator 1, including a liner providing a compartment 2 for the storage of food. Shelves are provided in the refrigerator for holding the food stored therein, one such shelf being shown at 3. In order to support the shelves a plurality of shelf supporting studs are secured to the liner which defines the food storage compartment 2. One such stud is indicated at 4 in Fig. 1. For proper support of each shelf there are normally provided four such studs, two being secured to each side wall of the liner.

In Figs. 2 and 3, there are shown enlarged views illustrating a portion of the liner or panel 5 on which the shelf support stud 4 is mounted. It is desirable that the shelf support studs be easily mounted on the liner in order to facilitate assembly and it is sometimes desirable that the studs be easily removable for replacement in case of damage during use. A number of schemes have been employed for mounting the

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studs; for example, openings have been punched in the wall or panel and the portion of the walls surrounding each opening has been shaped to provide a helical thread-engaging surface. Both of the desiderata discussed above are achieved by my construction without the necessity of such shaping of the adjacent surface of the liner.

In my arrangement, an opening 6 is stamped in the liner 5 for receiving a threaded portion 7 of the stud 4. The opening 6 is generally circular in shape and, in the form illustrated, the liner 5 adjacent the opening includes two projections 8, 9 extending into the opening 6 for engaging the threaded portion of the stud 4. The projections 8, 9 are disposed at diametrically opposite sides of the opening 6. These projections 8, 9 are each arch-like in configuration to provide a tip and are located in the plane of the liner 5 so that no shaping of the liner 5 other than the stamping from the liner of a piece the shape of the opening 6 is required.

In order that the stud 4 may be satisfactorily screwed into the opening 6 with the tips of the projections 8, 9 in proper engagement with the stud, two parallel threads 10 and 11 are provided on the portion 7 of the stud. The projection 8 extends into engagement with the thread 10 and the diametrically opposite projection 9 extends into engagement with the thread 11. Since two parallel threads are provided, it will be apparent that corresponding points along the threads, that is, points equidistant from the ends of the threads measured along the helical length of the threads, always occur at diametrically opposite points in planes perpendicular to the longitudinal axis of the stud. For example, points *a*, *b*, *c* along the thread 10, as shown in Fig. 3, correspond to points *a'*, *b'* and *c'* respectively, along thread 11. The number of projections correspond to the number of parallel threads employed, namely, two in the form illustrated, and these projections are in the plane of the liner 5. Therefore, when the stud is inserted in the opening 6 in a position perpendicular to the liner 5, one projection 8 is received in one thread 10 and the other projection 9 is received in the other thread 11 at a diametrically opposite point. As the stud is screwed into position, the projection 8 engages the thread 10 progressively at the points *c*, *b*, *a* along the thread 10 and the projection 9 simultaneously engages the thread 11 at the points *c'*, *b'*, and *a'* respectively; the stud is, therefore, easily screwed into the opening 6 in the liner 5 perpendicular to the liner 5. In the finally as-

sembled position, a shoulder 12 of the stud frictionally engages a face 13 of the liner. Should it be necessary to remove the stud at any time, this may be easily accomplished by merely unscrewing the stud from engagement with the liner, the projections 8 and 9 riding in the threads 10 and 11 respectively, with the axis of the stud remaining perpendicular to the liner. Shelf supporting studs used in refrigerators, for example, are often molded from a suitable plastic material and, hence, the double thread construction illustrated can be provided as part of the molding operation. To minimize the possibility of binding of the screw during insertion or withdrawal, the major diameter d of the threaded portion 7 is made slightly smaller than the diameter of the generally circular opening 6 in the liner, and the minor diameter d' , that is, the distance between diametrically opposite points on the two threads at the roots thereof, for example, the distance between points c and c' , is chosen slightly smaller than the distance between the tips 14, 15 of the inwardly extending projections 8, 9 respectively.

It can be seen that by my invention a shelf support mounting assembly is provided wherein the shelf support stud is easily assembled and removed and wherein a simple stamping operation suffices to provide the stud receiving opening without the necessity of any accurate shaping of the surface surrounding the opening and, specifically, without the necessity of forming threads or inclined projections around the edge of the opening for cooperating with stud threads.

While for purposes of illustration I have shown a structure which includes two diametrically opposite projections 8 and 9 cooperating with a stud having two parallel threads, other combinations of projections and multiple thread studs may be employed. For example, three projections may be provided equally spaced about the perimeter of the opening, that is, at 120° intervals, and a stud having three parallel threads may be utilized, and so forth. In the case of the three-projection, three-thread structure, the radial distance from the axis of the stud to the outer circumference of the threads, which may be referred to as the major radius of the threaded portion of the stud, is chosen slightly smaller than radius of the generally circular opening in the liner. The radial distance from the axis of the stud to the bottom or root of the threads, which may be referred to as the minor radius, is chosen slightly smaller than the radial distance from the center of the opening in the liner to the inner extremity of each of the inwardly extending projections.

While the number of projections preferably is equal to the number of parallel threads, combinations may be employed in which the number of projections provided is less than the number of parallel threads. For example, a structure may be provided in which a stud having three parallel threads is employed and two projections are

utilized, these projections being spaced from each other around the perimeter of the opening by an angular distance of about 120° . Other combinations in which the number of threads exceeds the number of projections may be employed, so long as the projections utilized are spaced about the perimeter of the opening by an angular distance equal to 360° divided by the number of parallel threads provided on the stud, or, in some cases, some multiple of this angular distance. For example, four parallel threads could be employed with two projections spaced 180° apart, if desired.

While the mounting assembly has been illustrated as applied to a support for refrigerator shelves, it will be apparent that the construction could be employed with other walls or panels on which it might be desirable to mount such a stud.

Therefore, while I have shown and described a specific embodiment of my invention, I do not desire my invention to be limited to the particular construction shown and described, and I intend, by the appended claims, to cover all modifications within the spirit and scope of my invention.

What I claim as new and desire to secure by

Letters Patent of the United States is:

1. A shelf support assembly comprising a panel having a generally circular opening therein, and a shelf support stud received within said opening, said stud having a plurality of parallel threads thereon, said panel being shaped to provide at least two arch-like projections extending in the plane of said panel into said opening, the central portions of said projections being spaced about the perimeter of said opening by an angular distance equal to 360° divided by the number of parallel threads on said stud, the tip of each of said projections engaging a corresponding one of said threads.

2. A shelf support assembly comprising a panel having a generally circular opening therein, and a shelf support stud received within said opening, said stud having a plurality of parallel threads thereon, said panel being shaped to provide a plurality of arch-like projections extending in the plane of said panel into said opening, said projections being equally spaced about the circumference of said opening and being equal in number to the number of threads on said stud, the tip of each of said projections engaging one of said threads.

ALFRED G. JANOS.

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