

Jan. 27, 1953

R. J. BACKMAN

2,626,773

SHELF SUPPORT

Filed Sept. 11, 1950

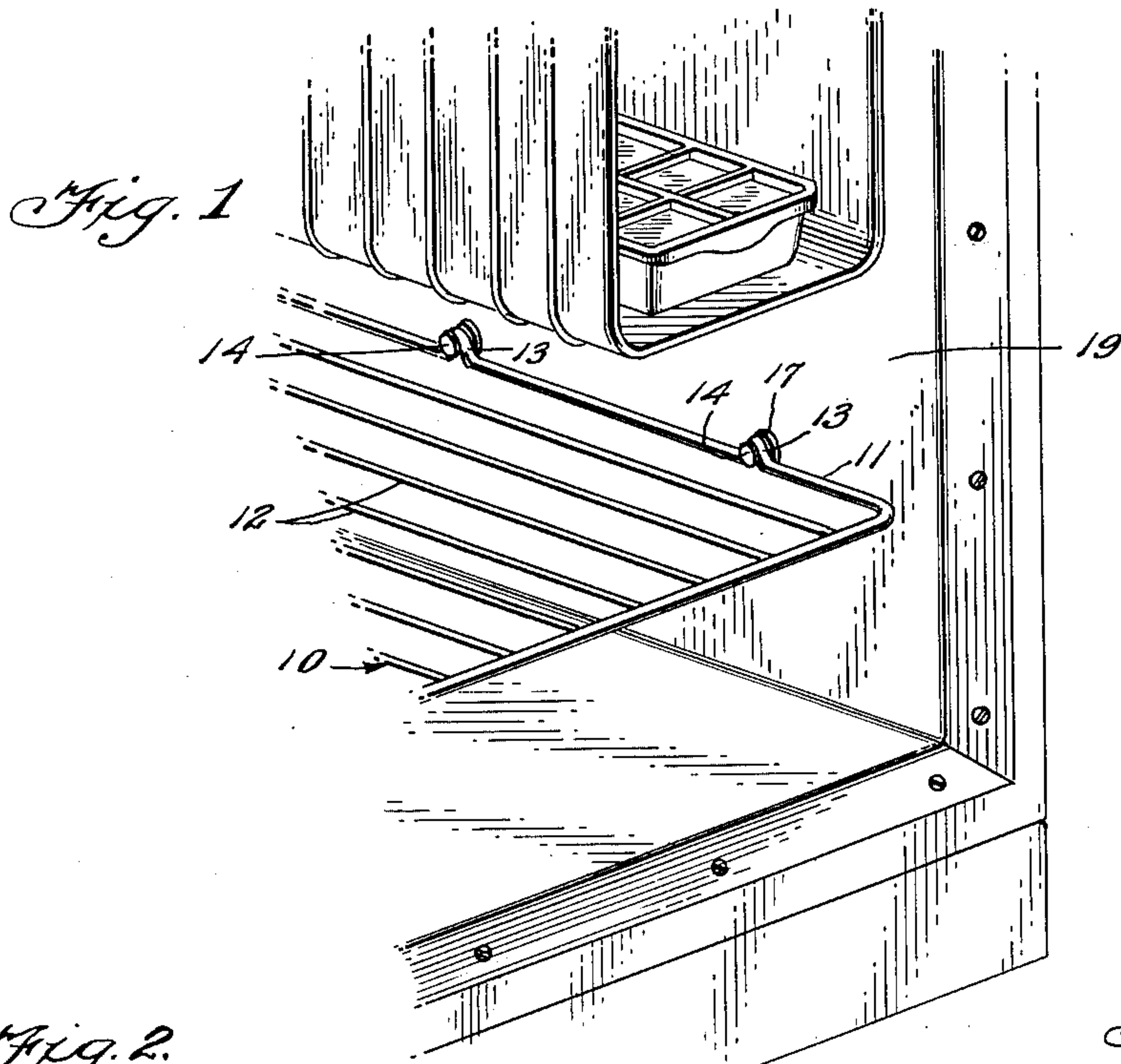


Fig. 2.

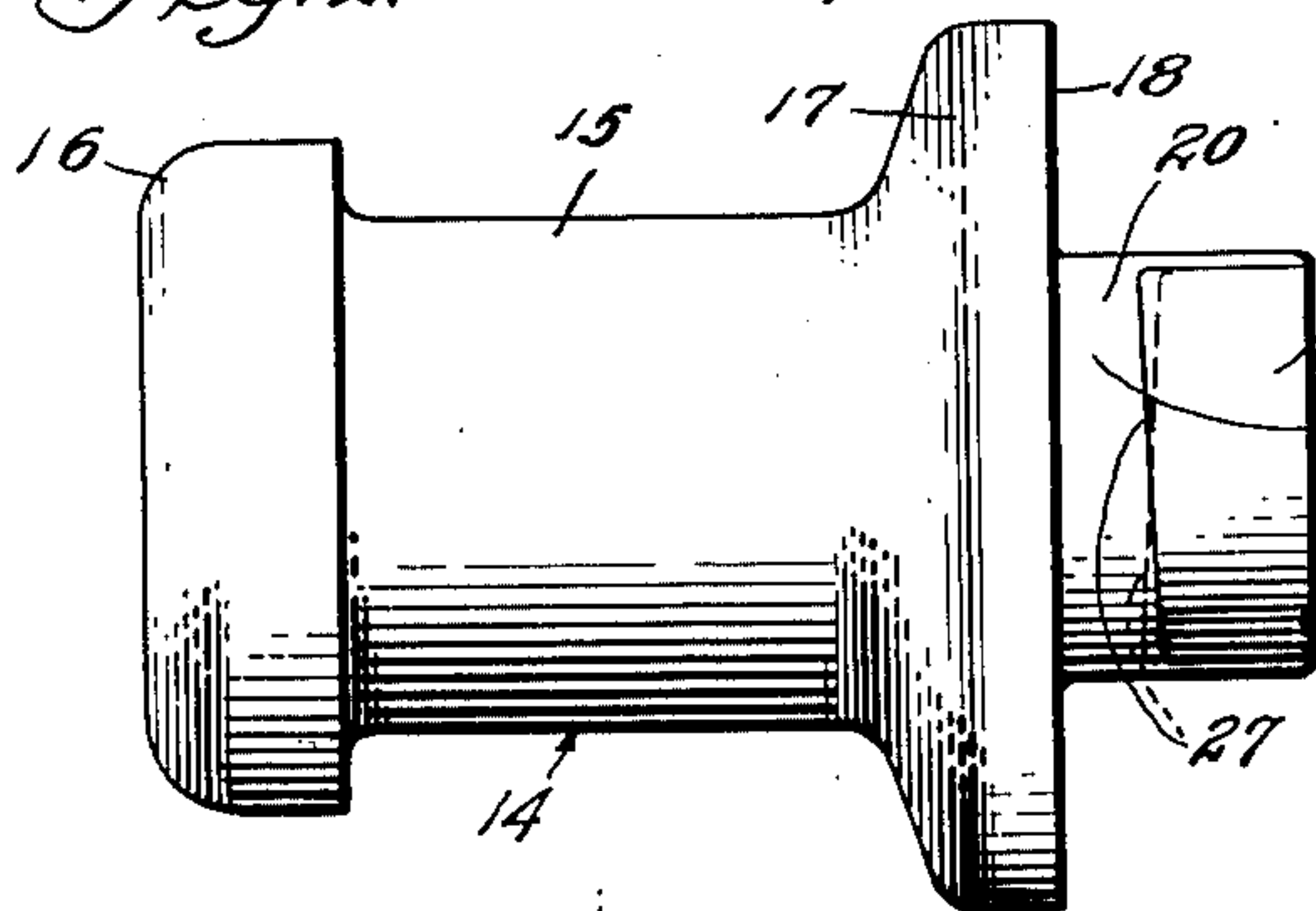


Fig. 3.

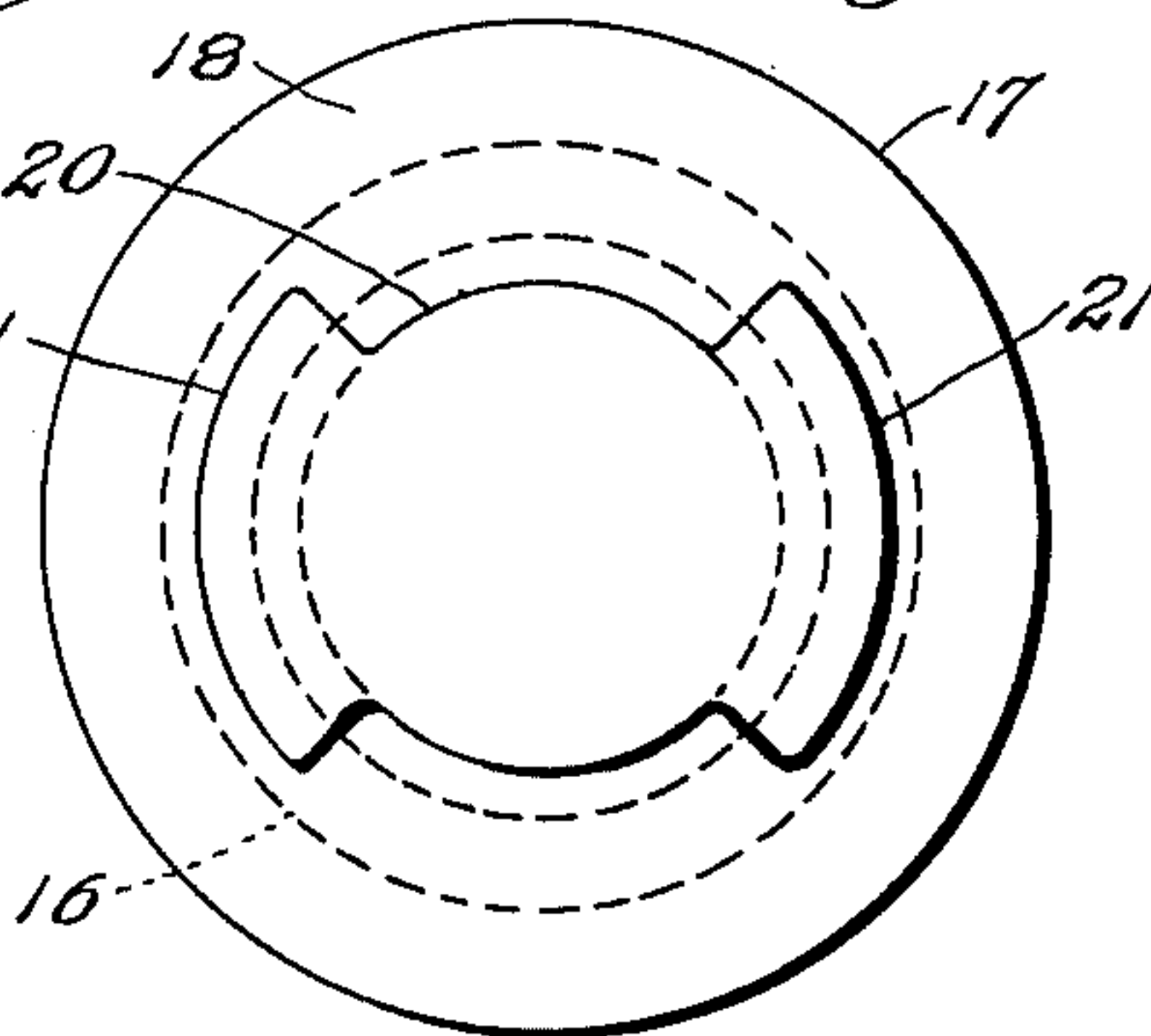


Fig. 4.

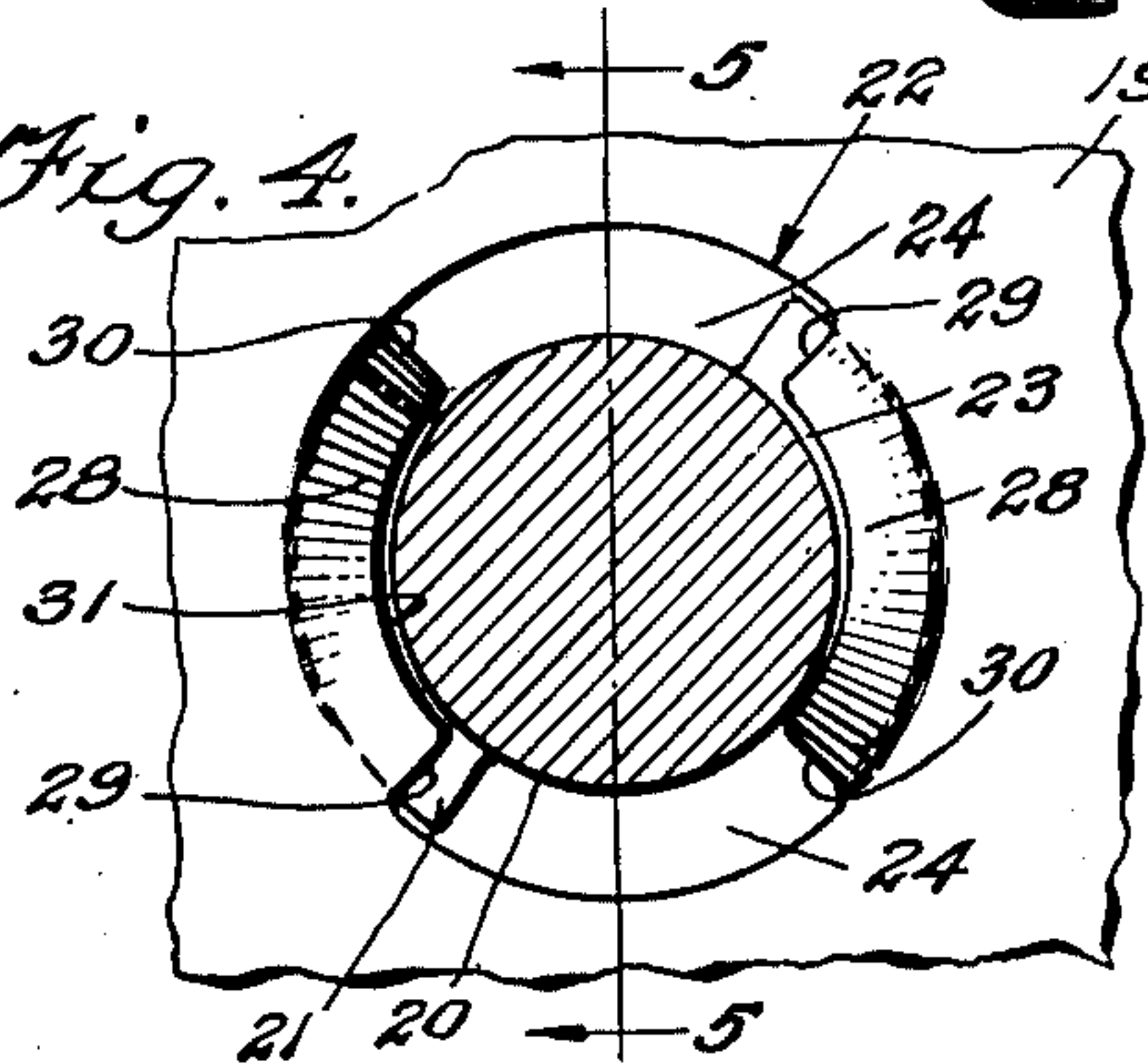
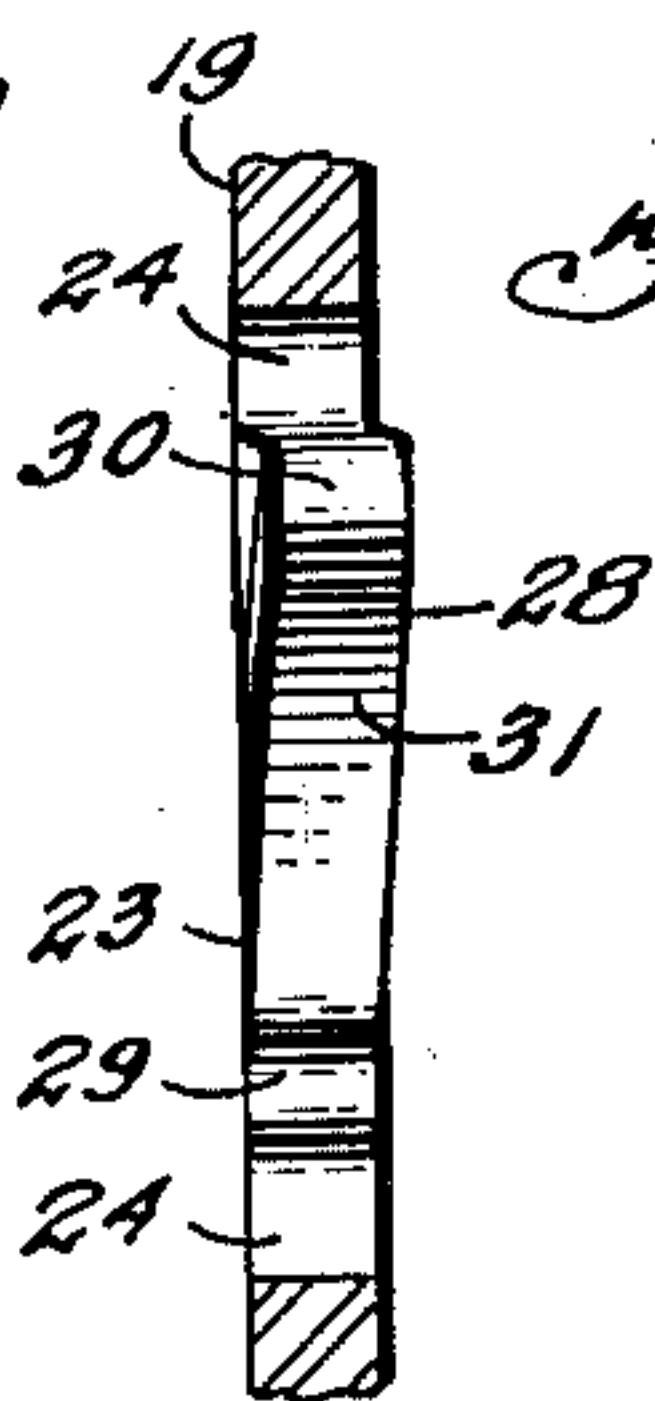


Fig. 5.



Inventor
Rodger J. Backman

By McCanna and Morsbach
Attorneys

UNITED STATES PATENT OFFICE

2,626,773

SHELF SUPPORT

Rodger J. Backman, Rockford, Ill.

Application September 11, 1950, Serial No. 184,185

6 Claims. (Cl. 248—239)

1

This invention relates to shelf supports and more particularly to that type used in supporting detachable shelves in mechanical refrigerators and cabinets.

It has for an object to provide a bracket to be quickly and easily attached to a sheet metal wall without the need for screws or other fastening means.

A further object is the provision of a bracket having a headed shank to fit into a specially shaped opening in the sheet metal wall of a cabinet or refrigerator with provisions to tighten the support as it is turned from its installing position.

A still further object is the provision of a bracket for shelving in a cabinet or refrigerator having a headed shank to fit into a special shaped socket in the inner shell of a double wall construction with provisions for a locking action upon turning the bracket from its inserted position, and further for the provision of easy replacement of any bracket which may become broken or damaged.

Another object is the provision of a bracket member for shelving which is stubby for its overall length so that it may be easily molded of resinous material to provide great tensile strength in the portion subject to strain, and great resistance to bending in the portion supporting the overhung load, and permits taking advantage of the inherent characteristics of molded resin to allow the metallic mating member to bite into the gripping portion of the bracket, for a tight, permanent junction.

Further objects will be apparent from the following specification, appended claims and drawings thereof in which—

Figure 1 is a perspective view of a portion of a refrigerator showing brackets in place;

Fig. 2 is an enlarged side elevation of a bracket member;

Fig. 3 is an end elevation of the bracket;

Fig. 4 is an elevation of a shaped opening to receive a support showing the shank and lugs in place, and

Fig. 5 is a section through the socket member only on line 5—5 of Fig. 4.

In mechanical refrigerators and some sheet metal cabinets, there is a double wall construction which makes it impossible to get to the back face of the inner wall for access to screws or other fastening means in case a replacement becomes necessary. In mechanical refrigerators this space between the inner and outer walls is filled with insulating material to add to the complications in making replacements.

2

This invention provides for an original installation, or a replacement installation as the case may be, as in either case, a bracket when properly installed and when not subjected to abuse, will last for the life of the equipment. If a replacement becomes necessary, the broken shank may be pushed out of the way, as for instance, into the insulating material, when a new shank is inserted and turned in the opening.

Referring to the drawings, Figure 1 shows a portion of a refrigerator including a shelf 10 which comprises a marginal frame 11 and the usual longitudinal bars 12. The marginal frame 11 may have the loops 13 formed therein to fit over the short stubby brackets 14.

A plurality of these brackets are provided so that the shelving is properly located and supported. Each bracket 14 comprises a short stubby body portion 15 which terminates in a flattened head 16, and an enlarged flange 17 which forms a shoulder 18 to bear against a supporting wall 19. A shank 20 extends axially from the shoulder 18 and has lugs 21 formed thereon.

The body portion 15 is cylindrical in shape so that a loop 13 may be easily placed over it, and the length of this portion is slightly longer than the diameter of the stock from which the marginal frame 11 is formed. There may be some lateral play in the shelving when in place, so the heads 16 serve to prevent the shelving from slipping off the support and the enlarged flanges 17 prevent the shelving from coming into contact with the inner wall 19 of the refrigerator or cabinet as the case may be.

The sheet metal from which the inner wall 19 is formed will be punched to provide sockets 22 shown in Fig. 4. Each of these sockets has a central circular portion 23 formed in the diametrically opposed horizontal quadrants and enlargements 24 in the diametrically opposed vertical quadrants. The diameter of the enlarged areas is slightly larger than the diameter of the lugs 21 on the shank 20 and the circular portion 23 is slightly larger than the diameter of the shank 20 so that a sliding fit is provided for inserting the shank 20 and lugs 21 into the hole 23 and enlargement 24. In punching the sockets 22 the punch will provide for rounding sharp corners and for fillets in the sharp recesses so that the shank and lugs on the bracket will not be damaged during the installation.

The inner face of each lug 21 is inclined at a gradual pitch at 27, from its leading edge to its trailing edge to provide for tightening the bracket as it is turned in a clockwise rotation after being inserted in the hole 22.

3

The overhanging metal in each horizontal quadrant forms a locking member 28 which engages a lug 21 when the support is installed. To insure a gripping contact with the inclined face 27 of the lug 21 when the support is installed, the locking member 28 has its leading edge 29 in a plane common to that of the wall 19, but progressively from this leading edge to the trailing edge 30 this locking member 28 is depressed from this common plane, with the greatest depression at trailing edge 30. The inner edge 31 of this locking member is formed into an advancing screw thread, of substantially the same pitch as the inclined face 27 of the lug 21.

When the bracket 14 has its shank 20 inserted in the hole 22 and then the bracket is rotated in a clockwise direction, the face 27 on the lug 21 engages under a locking member 28. As it is turned, the lug 21 impinges the face of the side wall 19 against the shoulder 13 and tends to bend this depressed area against the inherent resistance of the metal and to bind the resinous material of the lug 21 against the harder material of the locking member 28. This forms a junction which remains under compression during the life of the equipment to hold the bracket 14 against reverse rotation and loosening.

The bracket 14 may be made of soft metal, but it will preferably be molded of resinous material because of cost and ease of production. An advantage to the use of plastic material is that when the lugs 21 on the shank 20 engage the hard metallic locking members 28, of the side wall 19, it is possible for the face 27 of the lug 21 to seize to the metal and provide a uniform and non-slipping junction between the plastic and metal.

In case an impact causes one of the shanks 20 to break off, the broken part will fall between the double wall, and a new support may be installed as in the original case. In a refrigerator installation, the insulating material behind the broken part may hold it in place. However, in that case, the broken part may be pushed to one side to accommodate a new support, or the new support may push the broken part further back into the insulation.

While this bracket is not intended as a removable fixture when used in refrigerators, its use in cabinets may utilize its easy removal feature for those cases where a change in the spacing of the shelving is desired. Removal of the bracket may be accomplished by rotating the body 15 in a counterclockwise direction until the lugs may be withdrawn through the enlargement 24, and the support moved to its new position in one of a series of holes provided for such changes.

This method of mounting the bracket very closely resembles a breech block mounting wherein the shank 20 is positioned correctly with respect to the socket 22 and inserted in place until the flange 17 engages the wall 19, then a partial twist fastens it in place. In this instance however the softer resinous bracket seizes upon the locking member and causes a permanent frictional contact and tension to exist to hold the parts together and against unintentional release.

The central opening 23 formed in the horizontal quadrants provides a pivotal axis for the shank 20, as the constrictions thus formed prevent the shank from shifting into one of the enlarged opening areas.

I claim:

1. In a shelf support, the combination of a supporting wall formed with an aperture for the reception of a support bracket, said wall being

4

formed with spaced cut away portions extending radially outward from the periphery of the aperture and separated thereat by solid wall portions of substantial extent, said solid wall portions each being depressed progressively rearwardly from the plane of the supporting wall in one direction angularly about the aperture, and a support bracket formed with an enlarged transverse shoulder presenting a flat inner face to engage the front face of the supporting wall, a shank extending rearwardly from the shoulder and dimensioned to pass freely through the aperture in the supporting wall, and spaced enlarged transverse lugs of substantial extent at the rear end of the shank dimensioned to pass freely through said cut away portions extending from the aperture in the supporting wall, said lugs at their inner faces adjacent said flat face on the shoulder being inclined progressively rearwardly at substantially the same angle as said solid wall portions around the aperture in the supporting wall, the inner face on each supporting lug at one point thereon intermediate its rearward inclination being spaced from said flat face on the shoulder by a distance equal to the thickness of the supporting wall and being operative to exert a clamping force over a substantial extent of the corresponding solid wall portion of the supporting wall when the bracket is inserted into said aperture and turned angularly in the direction of the rearward inclination of said solid wall portions.

2. The combination of claim 1, wherein said supporting wall is of metal and said bracket is of integral molded resin construction, with said lugs on the bracket being operative to seize upon said solid wall portions around the aperture in the supporting wall for tight engagement therewith when the bracket is inserted into said aperture in the supporting wall and turned.

3. The combination of claim 1, wherein said cut away portions in the supporting wall are diametrically opposed and substantially form quadrants separated by intervening quadrants formed by said solid wall portions, and said lugs each have a transverse extent slightly less than the extent of the corresponding cut away portion for engagement with said solid wall portions over substantially the entire extent of the latter.

4. The combination of a supporting wall formed with an aperture for the reception of an attachment bracket, spaced resilient metal members of substantial extent inclined progressively in a direction rearwardly away from said supporting wall at locations spaced around the aperture therein, and an attachment bracket formed with an enlarged transverse shoulder presenting a face for engaging the front face of the supporting wall, a shank extending rearwardly from the shoulder and dimensioned to pass freely through the aperture in the supporting wall, and spaced enlarged transverse lugs of substantial extent at the inner end of said shank dimensioned to pass between said resilient metal members, said lugs at their inner faces toward said shoulder being inclined progressively rearwardly at substantially the same angle as said resilient metal members and being operative to exert a clamping force over a substantial extent of the rear faces of said resilient metal members when the bracket is turned angularly in the direction of the rearward inclination of said resilient metal members after being inserted through the aperture in the supporting wall to position its shoulder

5

abutting against the front face of the supporting wall.

5. The combination of claim 4, wherein said bracket is of integral molded resin construction, with said lugs on the bracket being operative to seize upon said resilient metal members for tight locking engagement therewith when the bracket is inserted through said aperture in the supporting wall and turned.

6. The combination of claim 4, wherein said resilient metal members are diametrically opposed from one another and form spaced arcuate quadrants, and said lugs are formed as spaced arcuate quadrants for engaging said resilient

6

metal members over substantially the entire extent of the latter.

RODGER J. BACKMAN.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

| Number | Name | Date |
|-----------|-----------------------|---------------|
| 1,857,530 | Dandridge et al. | Mar. 10, 1932 |
| 2,244,978 | Tinnerman | June 10, 1941 |
| 2,258,668 | Zahodiakin | Oct. 14, 1941 |
| 2,282,360 | Horrocks | May 12, 1942 |