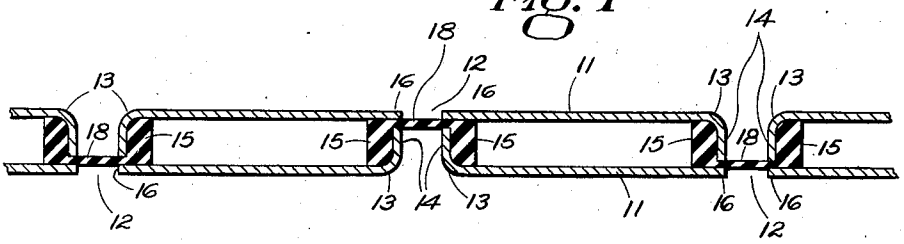
Jan. 11, 1949. J. J. SKELLY 2,458,537

FLEXIBLE WALL STRUCTURE

Filed Oct. 18, 1946

Fig. 1



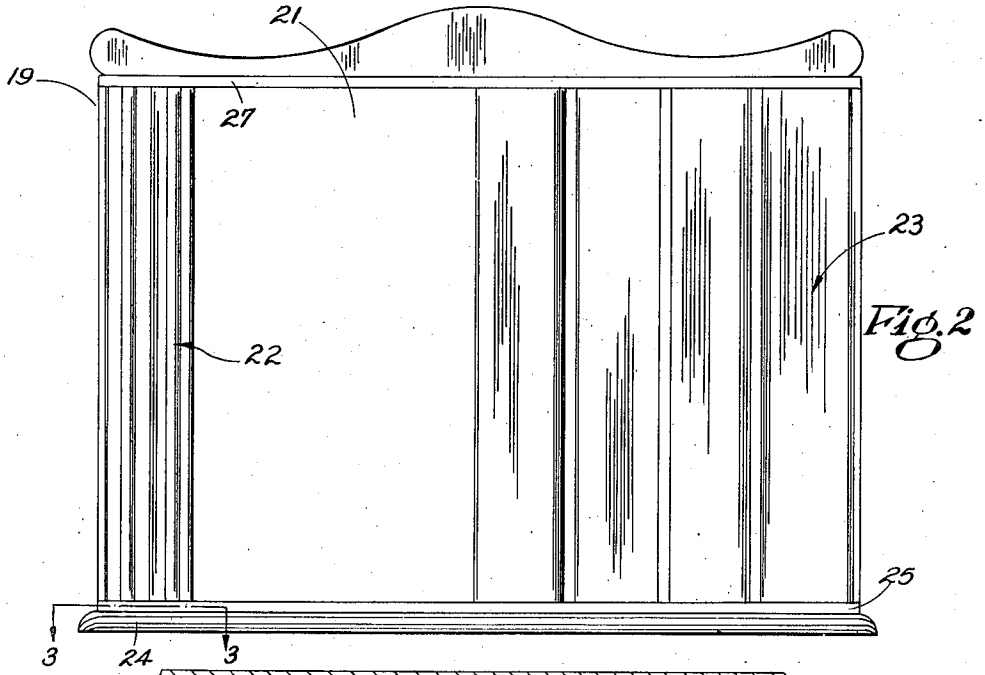




Fig. 2

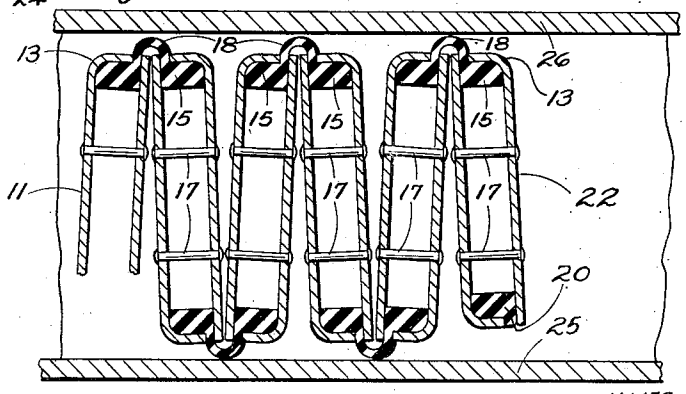



Fig. 3

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## FLEXIBLE WALL STRUCTURE

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Application October 18, 1946, Serial No. 704,105

3 Claims. (Cl. 160—229)

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My invention relates to flexible doors and closures.

An object of my invention is to provide a construction and a method of assembly for a sheet, wall, or other structural element which is relatively rigid with respect to one dimension and relatively flexible with respect to a transverse dimension in a plane, or which may be warped into various shapes while retaining stiff straight-line elements. Another object is to provide a structure which is light in relation to its area and in relation to its strength, which is readily fabricated and is adapted to ornamentation or to the use of ornamental finishes.

Another object is to provide an improved disappearing door or panel.

A further object is to provide a door or panel adapted equally well to bending in reverse directions and capable of having the same appearance on opposite sides.

Still another object of my invention is to provide space-saving closures for rooms, cabinets, garages, and the like.

Another object to provide an improved construction for window shutters, blinds, panels, or the like which must be flexible yet watertight.

Other and further objects, features and advantages of the invention will become apparent as the description proceeds.

In accordance with a preferred form of my invention, L-shaped members or slats, and strips of resilient material such as natural or synthetic rubber or rubber-like material are fitted in interlocking relation or bonded. The slats may be composed of sheet-metal, plastic material, perforated metal, screening or other suitable material according to the purpose intended.

A better understanding of the invention will be afforded by the following detailed description considered in connection with the accompanying drawing and those features of the invention which are believed to be novel and patentable will be pointed out in the claims appended hereto.

In the drawing:

Fig. 1 is a cross-section view of a structure forming one embodiment of my invention;

Fig. 2 is a front view of a cabinet employing doors having the structure of Fig. 1, the right-hand door being shown closed and the left-hand door folded to open position; and

Fig. 3 is a cross-sectional view of a structure similar to that of Fig. 1, but folded accordion-like.

Like reference characters are utilized throughout the drawing to designate like parts.

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As illustrated in Fig. 1, a plurality of relatively stiff pieces 11 are arranged side by side alternating with strips 12 of flexible, preferably resilient material. As indicated by the cross-sectional shapes shown in Fig. 1, the stiff pieces 11 are substantially L-shaped in cross-section, preferably rounded at the edges 13. The flexible strips 12 are channel-shaped or formed with flat U shaped cross-sections. The elements 11 and 12 are interconnected, as shown. The pieces 11 have flanges 14, overhanging corresponding base portions 15 of the resilient strips 12. In addition the contacting surfaces of the elements 11 and 12 may be cemented together.

Where an impervious wall or panel is desired the pieces 11 may be composed of sheet metal, transparent plastic, or the like, which lend themselves to decorative finishes or color effects. Owing to the flanges 14, stiffness is obtained with respect to the dimension parallel to the elements 11 and 12, while preserving lightness of construction. On the other hand, flexibility is provided with respect to the dimension perpendicular to the elements 11 and 12. This permits the structure to be bent in either direction into the form of a cylinder, or to be warped into a warped plane, or other shape containing straight-line elements, or to be folded in the manner of an accordion.

The strips 12 may be composed of natural or synthetic rubber or rubber-like material such as represented, for example, by neoprene, Koroseal, Thiokol, Vinylite and the like.

According to the effect desired, the pieces 11 may also be composed of transparent plastic, such as certain synthetic resins or condensation products, or they may be composed of perforated metal or screening.

Rubber cement of the rubber-to-metal type may be employed for bonding the strips 12 to the pieces 11. For example, I may use a cement of the type sold by the B. F. Goodrich Company, under the name "Vulcalok." Preferably care is taken to obtain intimate contact between the cemented surfaces when the cement is applied, and a tight bond may be assured by the application of pressure when the union is made.

The pieces 11 are arranged in pairs with the flange 14 of each strip of the pair lying along the flat edge 16 of the other. If desired the pieces 11 of each pair may be secured together independently of the bonding to the strips 12 so as to interlock the strips 12. For example, as illustrated in Fig. 3, rivets 17 may be provided; or cemented insert blocks may be provided as shown at 22 in Figs. 5 and 6 of my copending application Serial

No. 544,909, filed July 14, 1944, on which Patent 2,411,902 issued December 3, 1946.

Since the rubber strips are joined to the metal or plastic channel members in intimate contact, a structure is provided which is completely impervious to water although highly flexible with respect to one dimension. The stiffness in the other dimension provides obvious advantages when using the structure for window shutters, blinds or disappearing panels, or the like. It is evident that the construction illustrated provides the same appearance and finish on both sides. The flexible panel shown may be employed either where a flexible wall is to be fitted to or slid along curved guides or where a folded arrangement is desired. It is especially well adapted to accordion folding since there is a natural tendency for alternate strips 12 to bend in opposite directions along their web portions 18 when the paneling is subjected to sidewise thrust. The web portions 18 are preferably wide enough to permit 180-degree folding as illustrated in Fig. 3.

Although the flexible wall structure or paneling is by no means limited to certain uses which have been indicated by way of example, one of these uses is shown in Fig. 2 for the sake of illustration. In this case the panel is used to form folding doors for a cabinet 19, shown in front elevation, having a front opening 21. A left-hand door 22 is shown in folded or open position and a right-hand door 23 is shown in closed or flat position. The end pairs of pieces 11 forming each door may have what amounts to a half-resilient strip 20 confined between one set of confronting edges. For confining the flexible paneling forming the doors 22 and 23, suitable top and bottom grooves may be provided in the cabinet 19. The lower groove consists of a base board 24 and front and rear guide strips 25 and 26. A similar upper groove may be provided,



of which only the front guide strip 27 is visible in Fig. 2 of the drawings.

While I have described my invention as embodied in concrete form and as operating in a specific manner in accordance with the provisions of the patent statutes, it should be understood that I do not limit my invention thereto, since various modifications thereof will suggest themselves to those skilled in the art without departing from the spirit of my invention, the scope of which is set forth in the annexed claims.

What I claim is:

1. In combination, a plurality of strips of resilient material with a U-shaped cross-section, the outline of which comprises a pair of base portions joined by a web portion, and a plurality of pairs of bent shapes with flanges to form L-shaped cross-section, each of said strips having each of its base portions enclosed between a pair of bent shapes, the flanges in said pairs of bent shapes being alternated so that each such base portion is overlapped by one of said flanges.

2. The combination of claim 1 in which fastening elements are fitted into said bent shapes at intervals therealong and fastened thereto to secure said bent shapes together and interlock said resilient strips.

3. An accordion folding flexible panel comprising in combination a plurality of strips of flexible material having a U-shaped cross-section with a pair of base portions joined by a relatively wide web portion and stiff members embracing said base portions and alternated so that the web portions alternately lie close to one surface or the other of the panel to facilitate and tend to promote alternate bending of the paneling in opposite directions along said web portions.

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No references cited.