United States Patent [19]

Somerville

[11] **3,751,082**

[45] **Aug. 7, 1973**

[54] **CONNECTOR AND MODULES FOR STRUCTURAL ASSEMBLIES**

[76] Inventor: **Kenneth E. Somerville,** 47091 Dequinder, Rochester, Mich. 48063

[22] Filed: **Feb. 8, 1972**

[21] Appl. No.: **224,519**

[52] **U.S. Cl.** ..... **287/54 A,** 287/23, 287/85, 287/126, 211/182, 220/23.83, 297/440

[51] **Int. Cl.** **F16b 7/04,** F16b 2/20

[58] **Field of Search** ..... 287/54 A, 54 B, 54 C, 287/126, 23, 85; 312/111, 258; 211/182; 215/100.5; 220/97 B, 23.4, 23.83, 23.86; 297/440, 448

[56] **References Cited**

UNITED STATES PATENTS

1,959,262	5/1934	Colabrese	220/85 K
2,326,414	8/1943	Thompson	220/97 B X
2,328,543	9/1943	Bauman	220/97 B X
2,661,097	12/1953	Paul	220/97 B X
2,766,891	10/1956	Elzer	220/97 B X
2,957,601	10/1960	Novick	220/97 B
3,074,203	1/1963	Paksy	287/126 X
3,317,087	5/1967	Landis	285/235 X
3,515,262	6/1970	Ornstein et al.	215/100.5 X
3,451,322	11/1970	Bennett	211/182 UX

Primary Examiner—Jordan Franklin
Assistant Examiner—Wayne L. Shedd
Attorney—Luke A. Mattare, John F. Smith et al.

[57] **ABSTRACT**

Modular structure and method for constructing furniture and the like, wherein inexpensive, resilient connecting means is used to join together a plurality of normally discarded cans, such as soft drink and beer cans and the like, to construct useful items such as household furniture and decorations and the like with the discarded cans.

17 Claims, 43 Drawing Figures

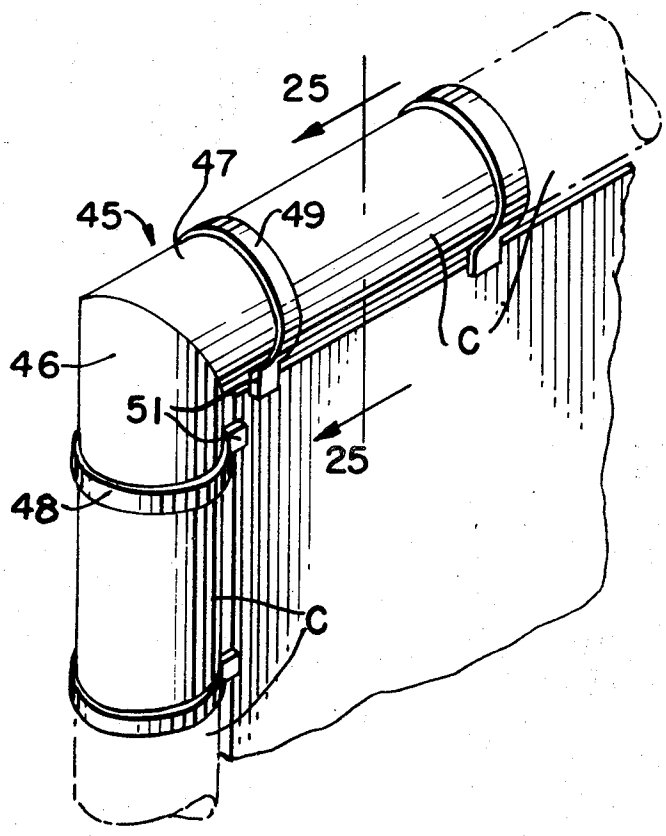
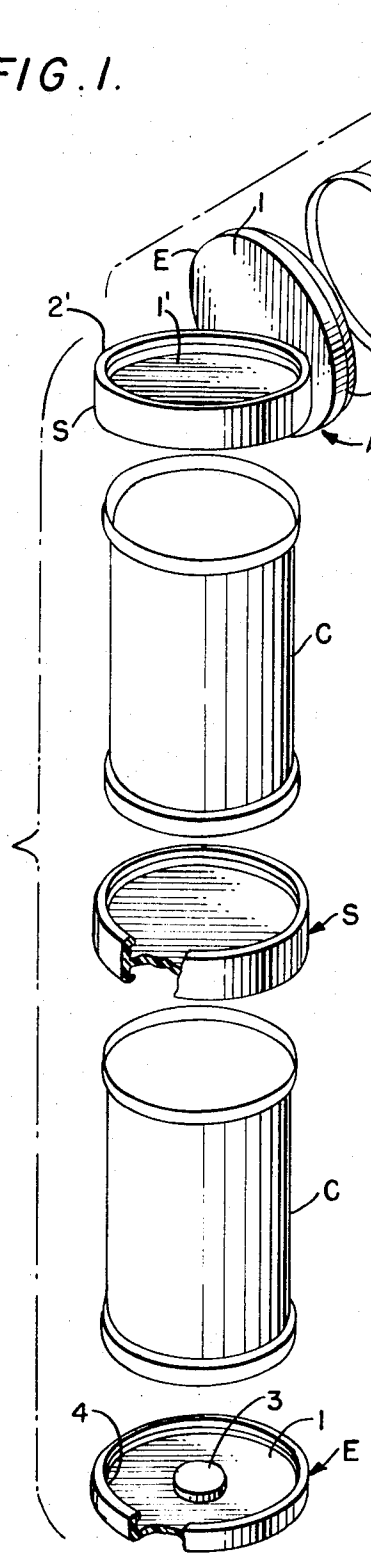


FIG. 1.



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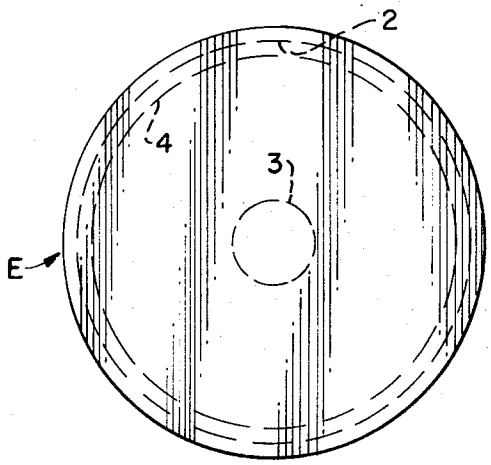

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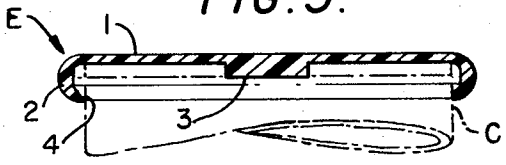

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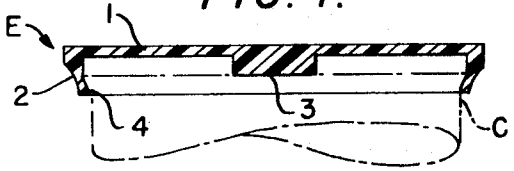

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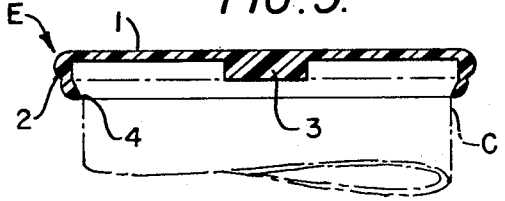

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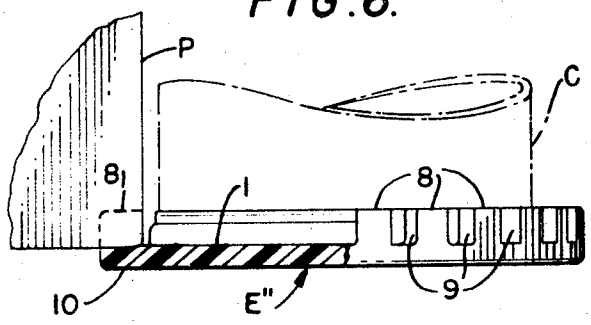

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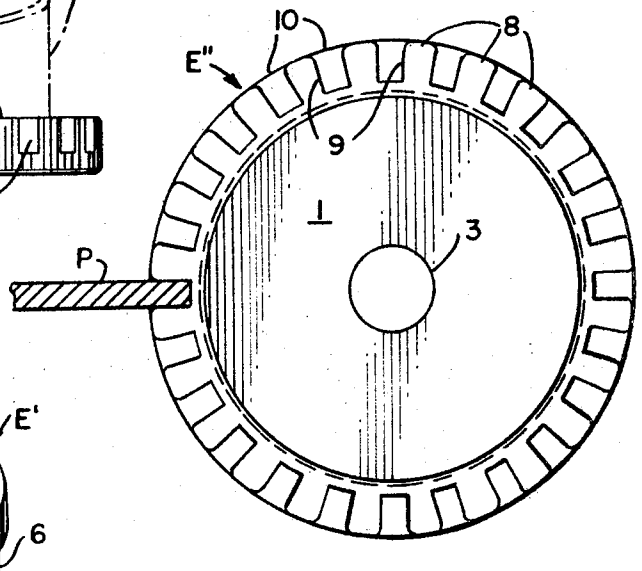

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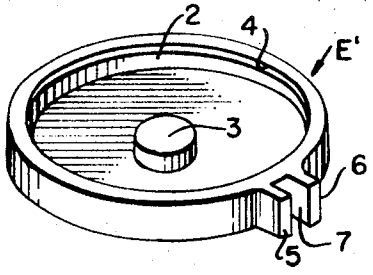

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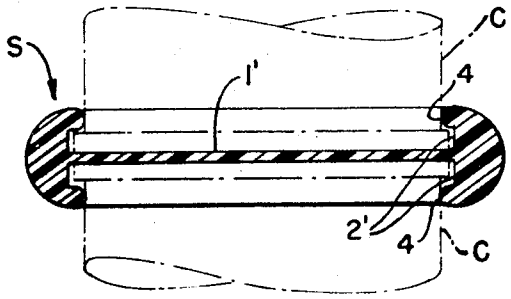

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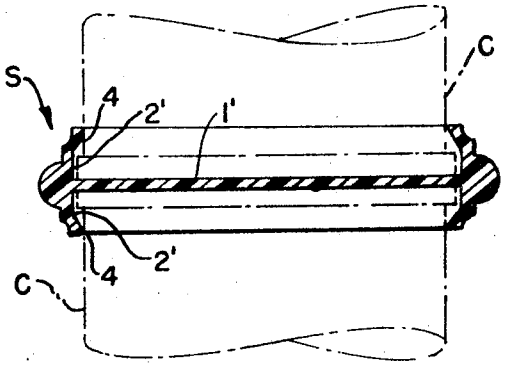

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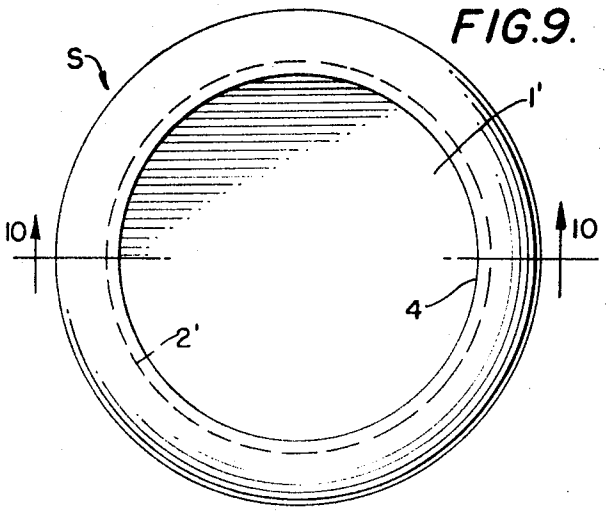

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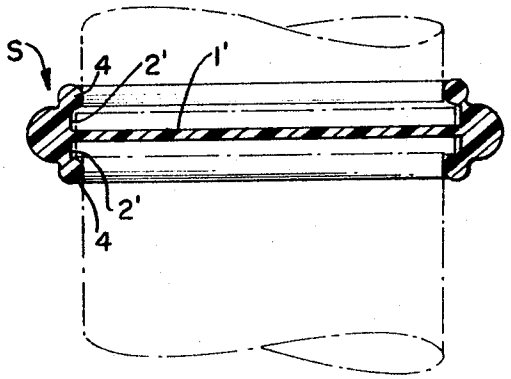

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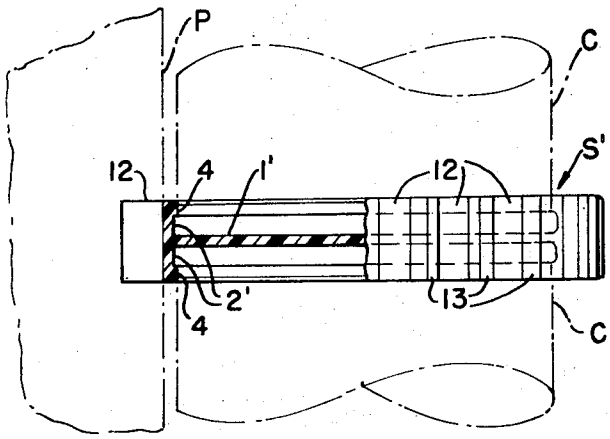

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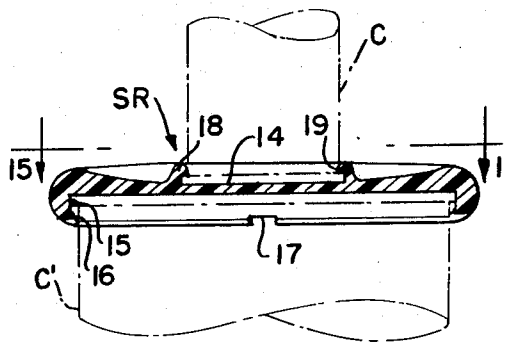

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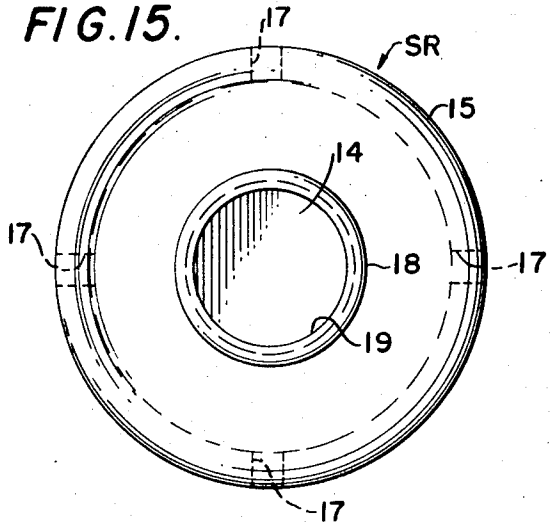

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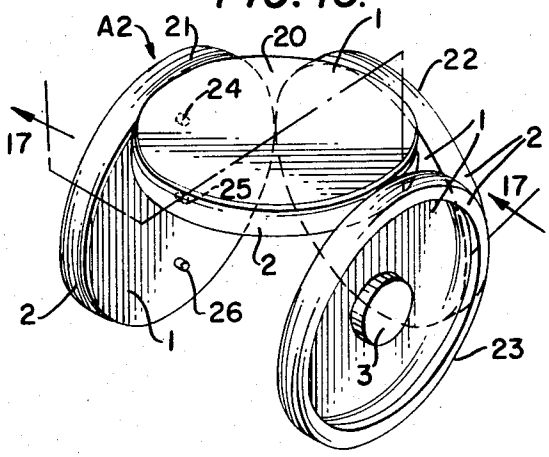

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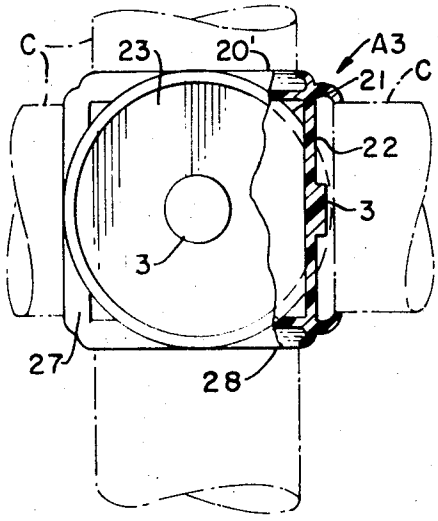

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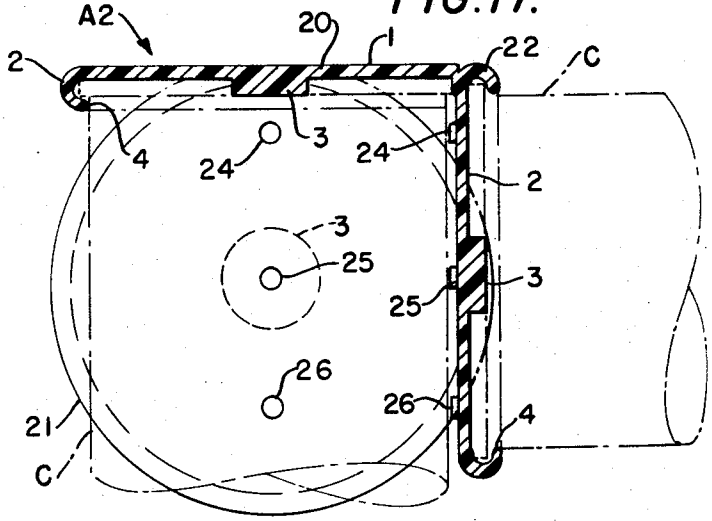

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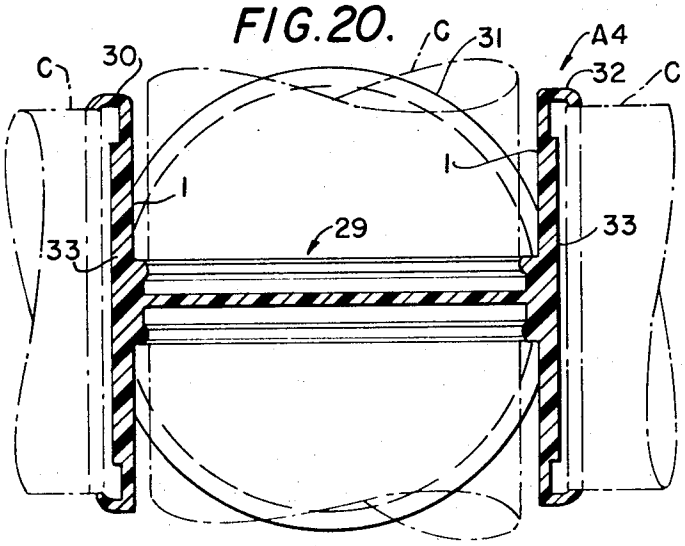

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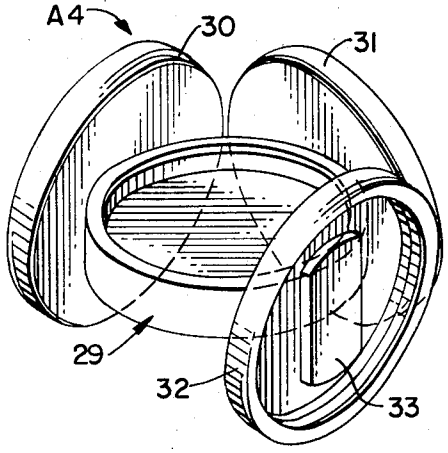

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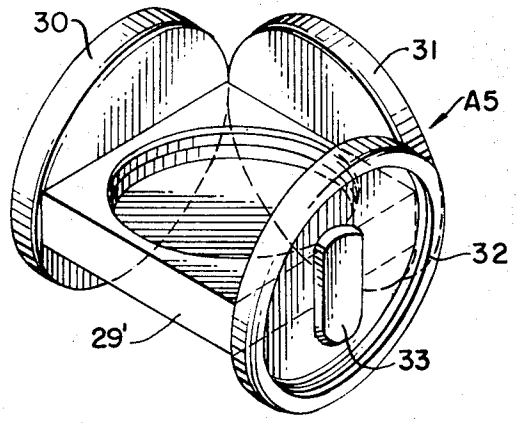

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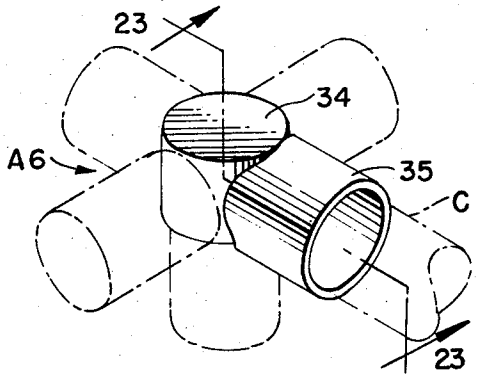

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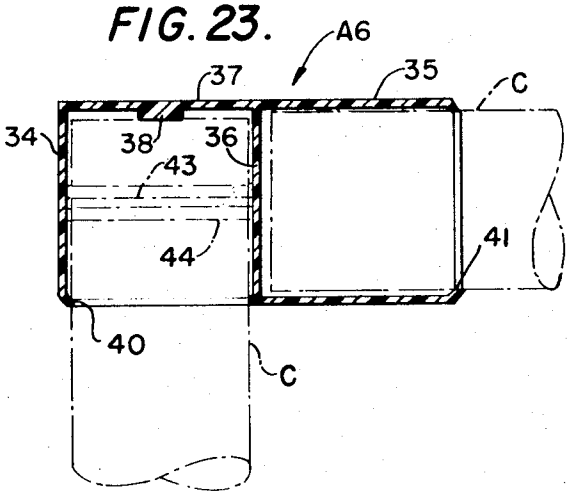

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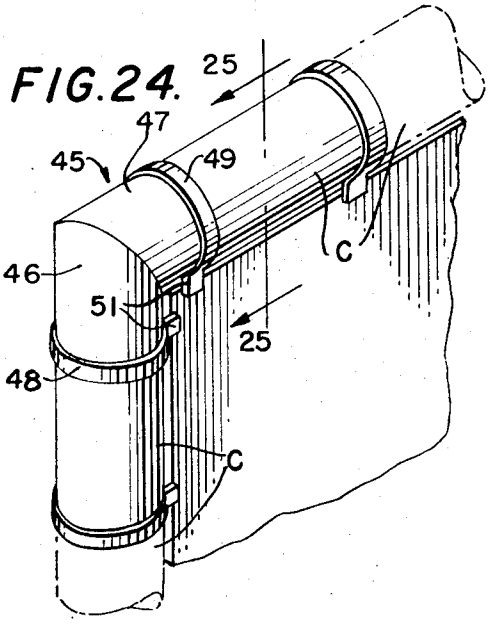

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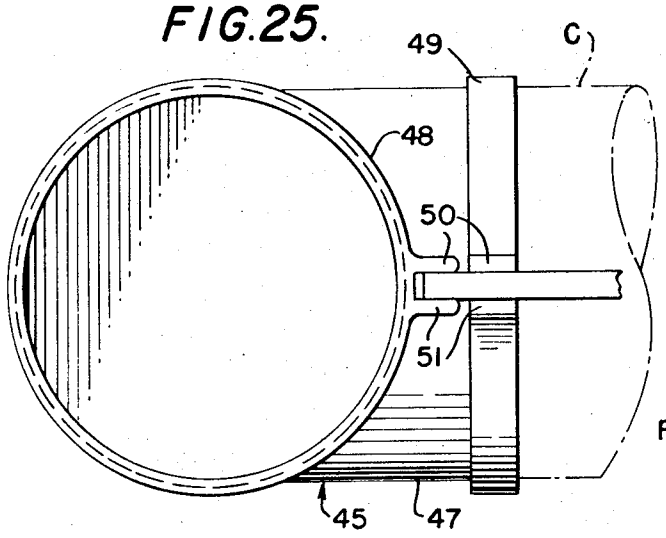

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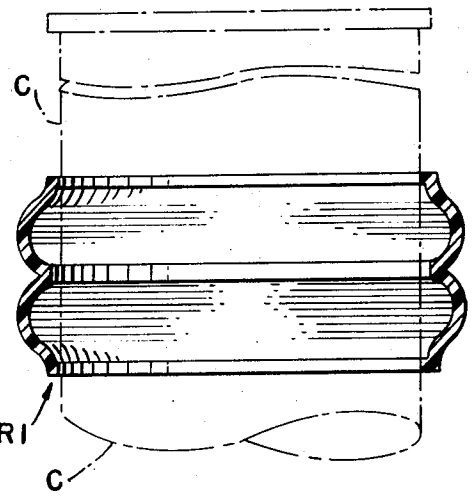

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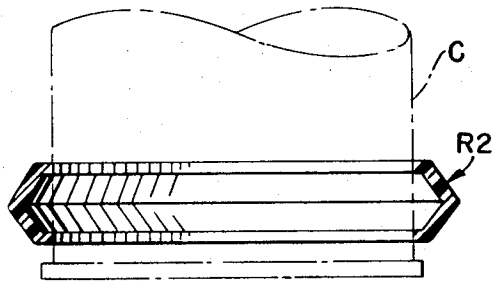

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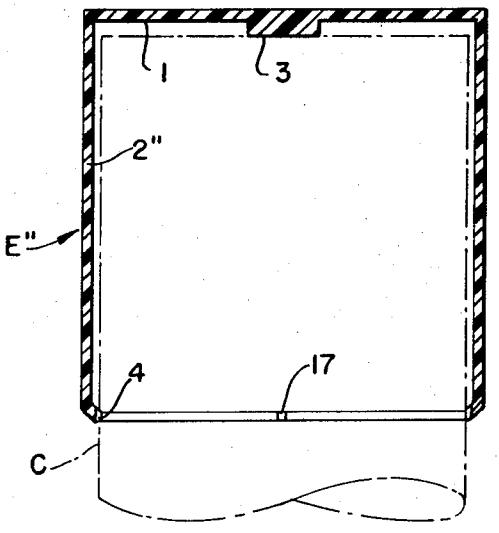

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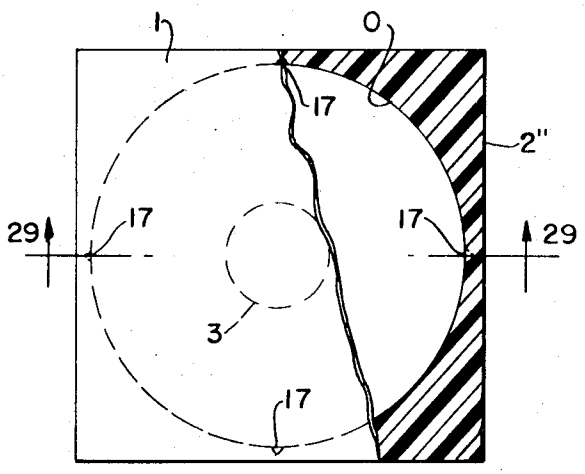

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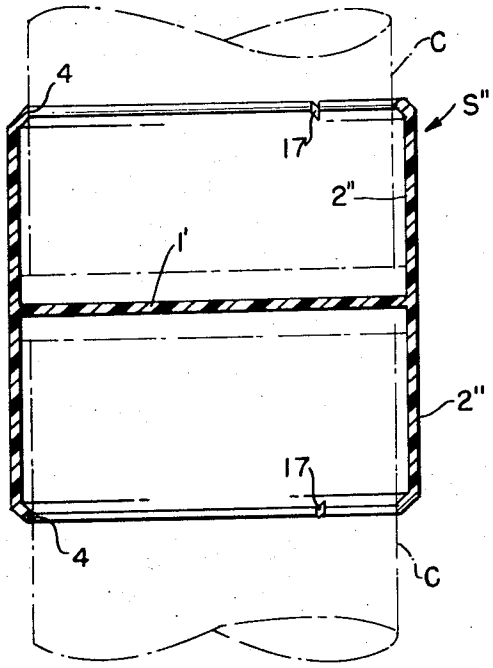

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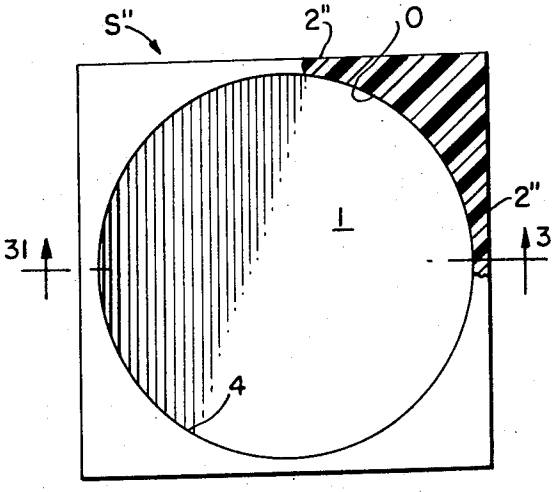

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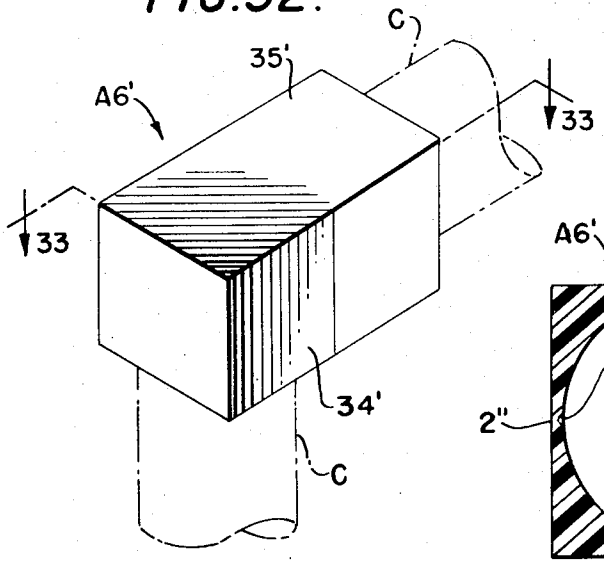

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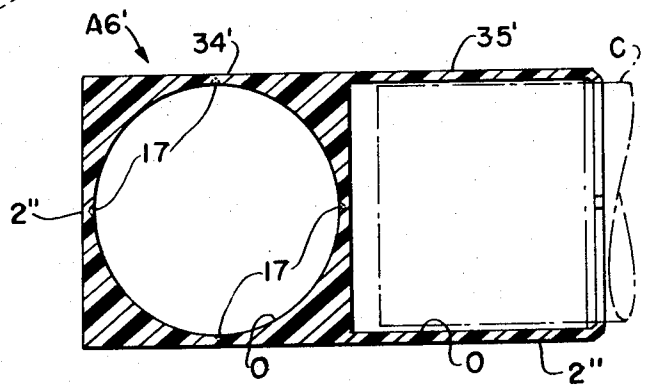


FIG.34.

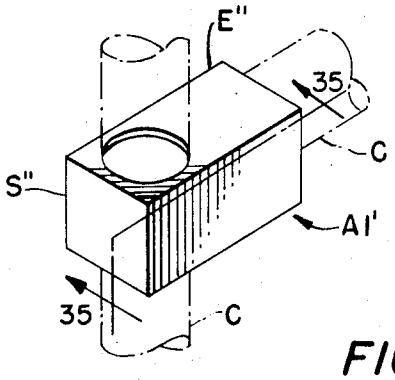
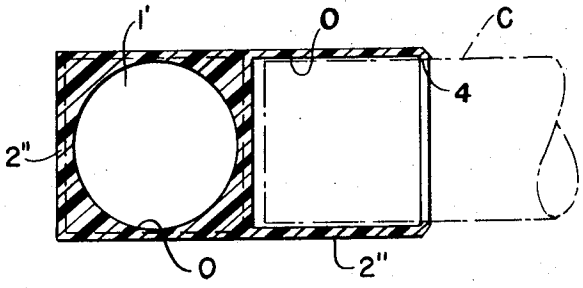


FIG.36.



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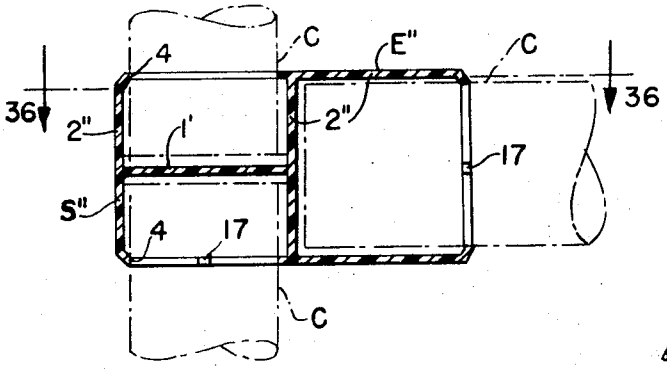

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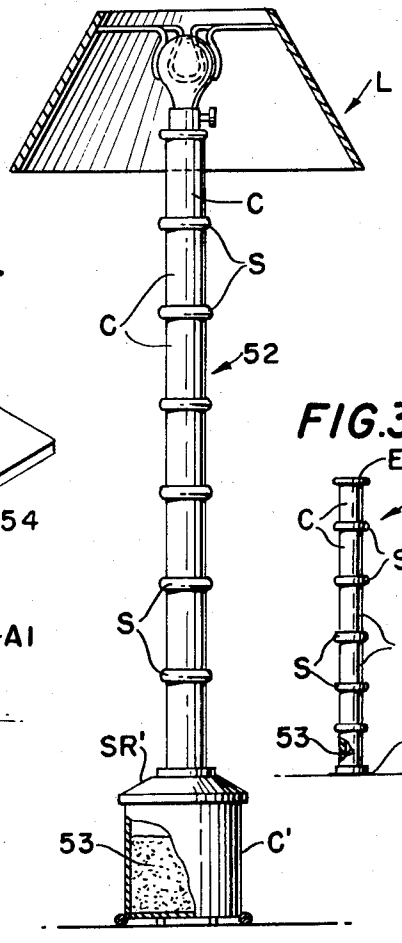

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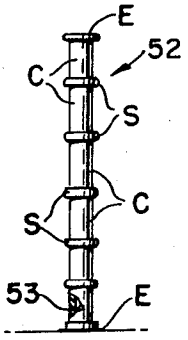
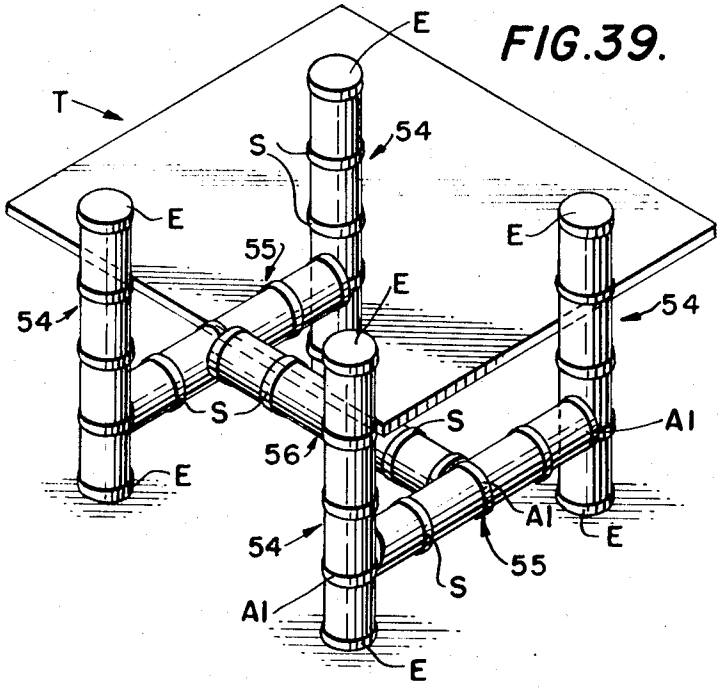


FIG.39.



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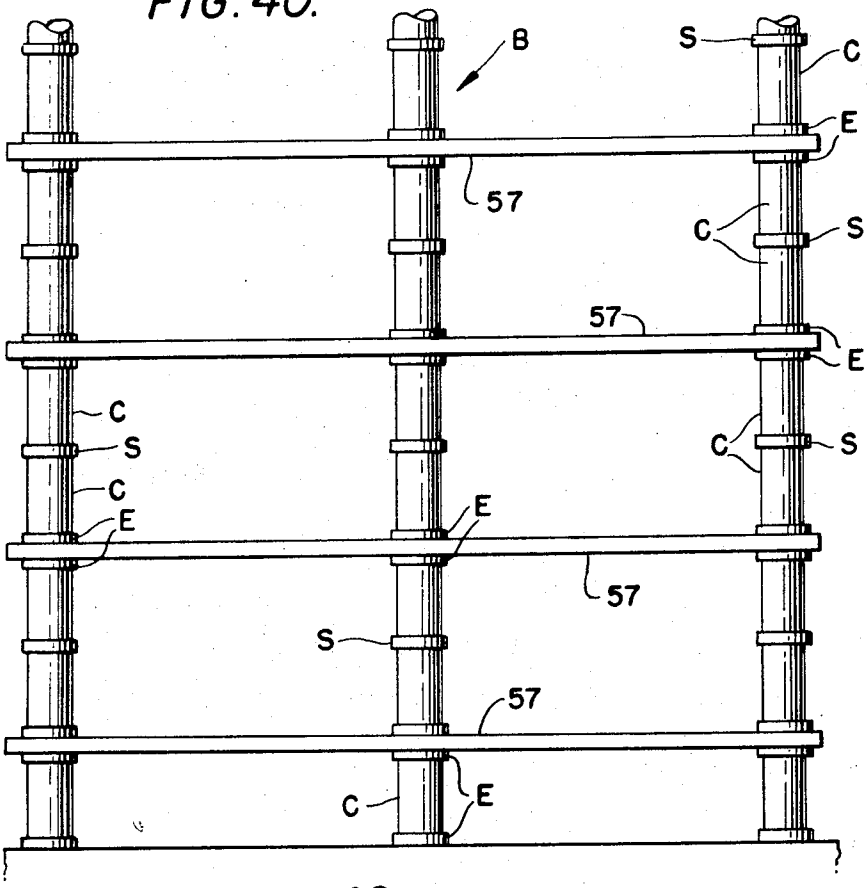
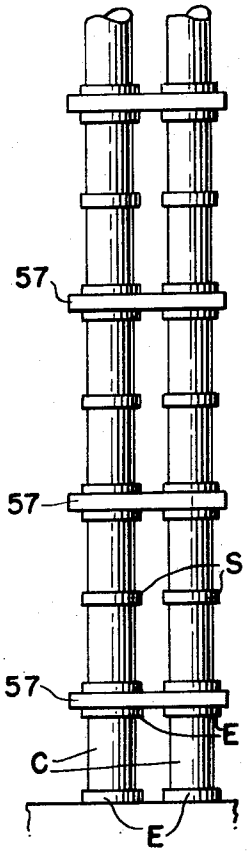


FIG. 41.



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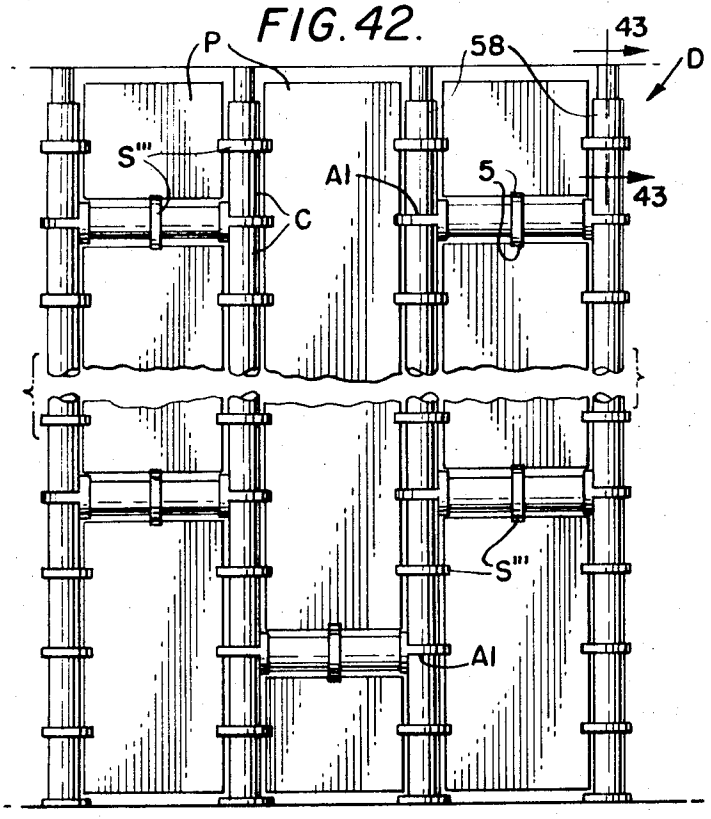

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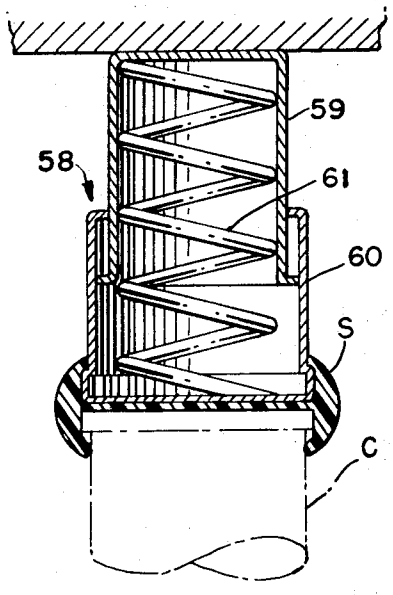

CONNECTOR AND MODULES FOR STRUCTURAL ASSEMBLIES

BACKGROUND OF THE INVENTION

This invention relates to furniture and the like constructed from cans of the type which normally contain food stuffs or beverages or other materials and which are normally discarded after the contents thereof are emptied, and to unique structural modules and method for joining together a plurality of such normally discarded cans to form the furniture and the like.

The widespread use of cans made of steel, aluminum, tin and the like for the packaging of food stuffs and beverages and other materials for merchandizing and sale has resulted in a serious problem from an ecological standpoint. Heretofore, when the contents of such cans were emptied, the cans were discarded, and because of the nondegradable nature of such cans, a serious disposal problem existed. Such cans are not readily recycled for further use nor are they capable of being burned in incinerators or the like, and accordingly, the handling and disposal of such cans is both expensive and extremely difficult to accomplish, resulting in substantial damage to the ecology.

With the present invention, cans of the type which normally contain food stuffs, beverages and other materials and which are normally discarded after the contents thereof are emptied are usefully reclaimed by using the cans to make inexpensive furniture and the like. Therefore, the invention serves not only to eliminate such cans from the tremendous amount of garbage and other refuse that accumulates daily in populous areas, and to thus enhance the ecological balance in such areas but also results in the cans being used for making useful articles such as furniture and the like.

Moreover, the simplicity and exceptionally low cost of the unique structural modules of the present invention enables a person to construct his own furniture or other articles with the use of only a few simple tools, such as a pair of pliers and a screwdriver.

According to the invention, an unique and inexpensive connecting means is provided for quickly and easily releasably joining together a plurality of such cans to form various useful articles such as household furniture and decorations and the like.

A plurality of modified forms of connecting means and couplers are taught by this invention, and each of the connecting means and couplers comprises a resilient disc-shaped web member of one-piece molded construction and having an integral, axially extending, annular, peripheral flange or wall on at least one side for receiving and holding a can therein.

The disc-shaped web member or portion of the couplers or connecting members extends across the end of an associated can when in use to reinforce the coupler or connecting member and prevent undesirable distortion of the annular flange.

According to one form of the invention, the connecting member has an annular flange or wall on only one side thereof and the web accordingly serves as an end cap for covering the end of an end most can in a structure constructed with a plurality of cans and connecting members or couplers according to the invention. In this form of the invention, a central spacing button or projection is formed on the same side of the web as the annular flange and abuts the end of the can to maintain the web in a substantially flat planar relationship.

In another form of the invention, the coupler has an annular, peripheral flange on both sides of the web for joining a pair of cans together in end-to-end relationship. In this form of the invention, it is not necessary to provide a button or projection on the web for engaging the ends of the cans since the web is not exposed to view.

In yet another form of the invention, the coupler includes a pair of connecting members joined together in right angular relationship, with each of the members having an annular flange thereon for receiving and holding a pair of cans in angularly disposed relationship with regard to one another. More particularly, according to this form of the invention, a pair of cans are held in right angular relationship and more than two connectors may be joined together in mutually perpendicular relationship for joining together as many as six cans disposed in perpendicular relationship to one another.

In still another form of the invention, the outer peripheral surface of the coupler or connecting member has at least one channel or notch therein for receiving the edge of a panel or the like so that a plurality of joined together cans may comprise a framework for supporting at least one generally flat, rectangular panel. This form of the invention should be used, for example, to form a room divider or other similar article wherein at least one and preferably a plurality of flat rectangular panels are held in assembled relationship by means of a plurality of cans held together with a coupling or connecting means as aforedescribed.

Other articles of furniture and the like can readily be made with the present invention such as, for example, tables, floor lamps, table lamps, ashtrays, bookshelves, umbrella stands and the like. Of course, it is readily apparent that there are various other items which can be made with the unique coupler or connector means of the present invention and a plurality of cans of the type which are normally discarded.

OBJECTS OF THE INVENTION

It is an object of this invention to provide articles of furniture and other items which are constructed from cans of the type which normally contain beverages or food stuffs or other materials and which are discarded after the contents thereof are emptied, said discarded cans being held together in assembled relationship by means of resilient coupler or connector means between the ends of adjacent cans.

Another object of the invention is to provide articles such as furniture and the like comprising a plurality of normally discarded cans held together in assembled relationship by connecting means and to the method of making same.

A further object of this invention is to provide a means for quickly and economically joining together a plurality of cans of the type which normally contain food stuffs or beverages or other materials and which are normally discarded after the contents thereof are emptied, to form useful items such as furniture or the like.

An even further object of this invention is to effectively reclaim and put to a useful purpose cans of the type which normally contain food stuffs, beverages or other materials and which are discarded after the contents thereof are emptied and to thus substantially reduce the problem of disposing of such cans and to accordingly improve the ecology.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an exploded perspective view of a structure incorporating a plurality of discarded cans and various types of couplers or connecting means according to the invention.

FIG. 2 is a plan view of one of the connecting means of the invention as used on the end of an end most can in a structure to provide a cover for the end most can.

FIG. 3 is a sectional view in elevation of a slightly modified connector of the type shown in FIG. 2.

FIGS. 4 and 5 are sectional views similar to FIG. 3 of further slightly modified connectors.

FIG. 6 is a view in elevation, shown partly in section, of another form of connector wherein a plurality of notches are formed about the periphery thereof for receiving the edge of a panel therein.

FIG. 7 is a top view of the connector shown in FIG. 6.

FIG. 8 is a top perspective view of a modified form of the connector shown in FIGS. 6 and 7, wherein a single channel or notch is on the periphery of the flange for receiving the edge of a panel therein.

FIG. 9 is a plan view of a coupler which includes a central web, on the opposite sides of which are formed a pair of radially inwardly directed annular flanges for receiving the ends of a pair of cans therein to hold the cans in assembled, end-to-end relationship.

FIG. 10 is a view in section taken along line 10—10 of FIG. 9.

FIGS. 11 and 12 are views similar to FIG. 10 of slightly modified types of couplers.

FIG. 13 is a view similar to FIGS. 10, 11 and 12 of still another form of coupler, wherein a plurality of channels are formed about the periphery thereof for receiving the edges of associated panels.

FIG. 14 is a view in section of still another form of the invention wherein the coupler comprises a reducing coupler for joining a pair of cans of different size together in end-to-end relationship.

FIG. 15 is a plan view taken along line 15—15 in FIG. 14.

FIG. 16 is a top perspective view of still another form of the invention wherein a plurality of connecting members are joined together in right angular relationship to one another to form an angle coupler for joining a plurality of cans together in right angular relationship.

FIG. 17 is a view in section taken along line 17—17 in FIG. 16.

FIG. 18 is a view in elevation, shown partly broken away, of another form of the invention similar to the form of invention illustrated in FIG. 16.

FIG. 19 is a top perspective view of still another form of the invention which is similar to the form of the invention shown in FIG. 16 except that one of the connecting members comprises a coupler including flange means on both sides thereof for joining a pair of cans in end-to-end relationship.

FIG. 20 is a view in section taken along line 20—20 in FIG. 19.

FIG. 21 is a top perspective view of yet another form of the invention similar to FIG. 19.

FIG. 22 is a top perspective view of a still further form of angle coupler which comprises a pair of tubular, cup-shaped connecting members in which the ends of associated cans are received and held to hold the cans in assembled right angular relationship to one another.

FIG. 23 is a view in section taken along line 23—23 in FIG. 22.

FIG. 24 is a top perspective view of a portion of a structure constructed in accordance with the present invention wherein a plurality of couplers, such as shown in FIG. 8, and a further form of angle coupler are used to hold a plurality of cans together to form a framework with a flat, rectangular panel held therein.

FIG. 25 is a view in section taken along line 25—25 in FIG. 24.

FIGS. 26 and 27 are sectional views in elevation of decorative rings positionable on a can between the ends thereof to enhance the aesthetic appearance of a structure made in accordance with the invention.

FIG. 28 is a plan view, shown partly in section, of a modified form of end cap.

FIG. 29 is a vertical sectional view taken along line 29—29 in FIG. 28.

FIG. 30 is a plan view, shown partly in section, of a modified form of coupler.

FIG. 31 is a vertical sectional view taken along line 31—31 in FIG. 30.

FIG. 32 is a top perspective view of a modified form of angle coupler.

FIG. 33 is a horizontal sectional view taken along line 33—33 in FIG. 32.

FIG. 34 is a top perspective view of a further modified form of angle coupler.

FIG. 35 is a vertical sectional view taken along line 35—35 in FIG. 34.

FIG. 36 is a horizontal sectional view taken along line 36—36 in FIG. 35.

FIG. 37 is a view in elevation with a portion thereof broken away showing a structural module comprising a column of cans coupled together with couplers of the present invention.

FIG. 38 is an enlarged view in elevation, with portions thereof broken away, of a floor lamp constructed in accordance with the invention from modules such as shown in FIG. 28.

FIG. 39 is a top perspective view of a table constructed in accordance with the invention.

FIGS. 40 and 41 are front and edge views, respectively, of a bookshelf constructed in accordance with the invention.

FIG. 42 is a view in elevation, with a portion thereof broken away, of a room divider constructed in accordance with the invention.

FIG. 43 is a view in section taken along line 43—43 in FIG. 42.

DETAILED DESCRIPTION OF THE INVENTION

Referring more specifically to the drawings, wherein like reference numerals indicate like parts throughout the several views, a structure comprising a plurality of cans C joined together by a simple inline coupler S and an angle coupler A, with a pair of end caps E and E' at the opposite ends thereof, is shown in exploded relationship in FIG. 1.

The end cap E, as seen best in FIGS. 1–5, comprises a disc-shaped web 1 with an integral annular wall or flange 2 projecting substantially perpendicularly from one side of the web 1 about the peripheral marginal edge thereof. A relatively short cylindrical button or projection 3 is in the center of the web on the same side

thereof as the flange 2 and engages the end of an associated can C when in use to space the web 1 from the end of the can and maintain it substantially flat and planar. The edge of the flange 2 is turned radially inwardly to define an annular lip 4 which engages behind the flanged or beaded end of a can positioned therebehind as seen in FIGS. 3, 4 and 5.

The outer surface of the end cap or connector E of FIGS. 1 and 2 is of relatively straight cylindrical shape, whereas in FIG. 3, the outer surface is rounded; in FIG. 4, the outer surface has a cove shape; and in FIG. 5, the outer surface is beaded.

In FIG. 8, a modified end cap or connector E' is shown and is identical in every respect with the end cap or connector E of FIG. 1 except that a pair of radially projecting lugs or ears 5 and 6 project from the outer surface of the annular flange 2 and define a groove or channel 7 therebetween for receiving the edge of a flat rectangular panel.

In FIGS. 6 and 7, a still further form of end cap or connector E'' is shown, and includes a web 1 and a central button or projection 3 for spacing the web from an end of an associated can C. In this form of the invention, a plurality of equally spaced tabs or projections 8 project radially outwardly from the outer surface of the annular flange 2 and define a plurality of notches or channels 9 therebetween for receiving the edge of a panel P. The web 1 extends radially outwardly beneath the notches or channels 9 to define a stop 10 for the bottom edge of the panel P.

In FIGS. 1 and 9 through 13, the simple inline coupler S is shown and comprises a flat, disc-shaped web 1' with an annular peripheral flange 2' projecting substantially perpendicularly from each side thereof about the marginal edge of the web 1'. The edge of each flange 2' is turned radially inwardly to define an annular retaining lip 4 for gripping and holding the flanged or beaded end of a can C therebehind when the coupler S is placed over the ends of adjacent cans.

In FIG. 1, the coupler S has a relatively straight cylindrical outer peripheral surface and in FIGS. 9 and 10, the outer peripheral surface of the coupler S is semicircular. In FIG. 11, the outer surface of the coupler is cove shaped, and in FIG. 12, the outer surface is beaded.

In FIG. 13, a modified coupler S' is shown and is substantially identical with the form of the invention shown in FIG. 1, except that a plurality of radially outwardly projecting ribs or flanges 12 are formed on the outer surface of the flange 2' to define a plurality of equally spaced channels 13 therebetween for receiving the edge of a panel P. A radially inwardly directed lip 4 is on each flange as in the previously described embodiments of the coupler S for receiving and holding the flanged or beaded ends of cans C therein on opposite sides of the web 1'.

Referring to FIGS. 14 and 15, a further form of inline coupler SR is shown, and in this form of the invention, the coupler comprises a reducing coupler for joining two cans of different size together in end-to-end relationship. The reducing coupler SR comprises a disc-shaped web 14 increasing in thickness toward its outer peripheral edge and having an annular peripheral flange 15 formed integrally with the web 14 at the peripheral edge thereof and extending substantially perpendicularly from one side of the web. The edge of the flange 15 is turned radially inwardly to define a lip 16 for gripping and holding the beaded or flanged end of a can C' therebehind. The size of the web 14 and flange 15 is such as to accommodate a typical one gallon can C'. A plurality of notches 17 are formed in the lip 16 about the circumference thereto to enable air to escape from behind the flange 15 when the end of the can C' is placed in operative position against the web 14 and behind the lip 16. A diametrically smaller flange 18 is integrally formed on the other side of web 14 generally concentrically with the axis of the coupling SR and the edge of the flange 18 is turned radially inwardly to define a lip 19 for receiving and holding the beaded or flanged end of a can C placed therebehind. The size of the flange 18 is substantially the same as the size of the flanges 2 and 2' previously described for holding and receiving the end of a typical can such as a food or beverage can or the like.

In FIGS. 1 and 16 through 23, various forms of angle couplers are shown for joining together a plurality of cans in angular relationship to one another.

In FIG. 1, a first form of angle coupler A1 is illustrated, and the coupler A1 comprises an in-line coupler S integrally joined at one edge thereof with the midportion of the back of the web 1 of a connector E. The coupler A1 thus comprises a tee coupler for joining a plurality of cans C together in the shape of a T.

A second form of angle coupler A2 is shown in FIGS. 16 and 17 and comprises a plurality of substantially disc-shaped, integrally joined together connectors 20, 21, 22 and 23, each of substantially the same construction as the end cap or connector E disclosed in FIG. 1, in that each of the connectors 20, 21, 22 and 23 comprises a web 1, an annular peripheral flange 2, and a central projection 3. Each of the connectors 21, 22 and 23 is integrally joined at one edge thereof to the connector 20 at points spaced approximately 90 degrees apart about the periphery of the flange 2 on connector 20, and connectors 21, 22 and 23 face outwardly while connector 20 faces inwardly. Additionally, each of the connectors 21, 22 and 23 has a plurality of aligned projections or tabs 24, 25 and 26 on the back of the webs 1 thereof for engaging the side of a can C received within and held by the flange 2 of connector 20 to maintain the connectors 21, 22 and 23 in substantially parallel relationship with the axis of the can C held by connector 20. With this form of the invention, the connector 20 would be placed over the end of the end most can in a stack or row of cans and the end of a can would be positioned behind and held within the flange 2 of each of the connectors 21, 22 and 23 so that three rows or assemblies of cans would extend perpendicularly from the top of the first row of cans at points spaced 90° apart about the axis of the first row of cans.

In FIG. 18, a third form of angle coupler A3 is illustrated, and this form of the invention is substantially the same as that form of the invention illustrated in FIGS. 16 and 17 except that the connector 21' faces outwardly and two additional connectors 27 and 28 are integrally joined at their edges to the edges of connectors 20' 21 and 23 to form a six-sided angle coupler having six connectors thereon disposed perpendicular to one another for receiving and holding the ends of a plurality of cans C therein with the cans C disposed in perpendicular relationship to one another.

A fourth form of angle coupler A4 is illustrated in FIGS. 19 and 20 and is similar to the angle coupler A2 illustrated in FIGS. 16 and 17 except that the connec-

tor 20 is omitted, and an in-line coupler 29 of substantially the same construction as the in-line coupler S is integrally joined at three points spaced 90 degrees apart about its periphery with the mid portion of the back of the webs 1 of three connectors 30, 31 and 32 of substantially the same construction as end caps E. Further, an oblong spacing projection 33 is formed in the center of web 1 rather than the circular projection 3. The connectors 30, 31 and 32 are disposed perpendicular to the plane of the coupler 29.

A fifth form of angle coupler A5 is shown in FIG. 21 and is substantially identical with the angle coupler A4 illustrated in FIGS. 19 and 20 except that the central in-line coupler 29' has a substantially rectangular configuration as opposed to the circular configuration of the in-line coupler 29 in the angle coupler A4.

In FIGS. 22 and 23, a different type of angle coupler A6 is shown and in this form of the invention, a pair of substantially cup-shaped connectors 34 and 35 are joined together in right angular relationship. The length of each of the cup-shaped connectors 34 and 35 is substantially the same as their diameter, and the cup-shape connector 35 is integrally joined to the side 36 of cup-shaped connector 34 with the axes of the connectors 34 and 35 disposed at a right angle to one another. The side wall 36 of cup-shaped connector 34 comprises the end wall of cup-shaped connector 35. The end wall 37 of cup-shaped connector 34 has a central projection 38 therein which engages the end of a can C inserted within the cup-shaped connector to space the end wall 38 of the connector from the end wall of the can to maintain the end wall 38 substantially flat and planar. The open ends of the cup-shaped connectors are turned radially inwardly to define lips 40 and 41 for engaging and gripping the sides of a can inserted therein.

As seen in phantom lines in FIG. 23, a web 43 and flange 44 may be provided in either one or both of the cup-shaped connectors intermediate the ends thereof for engaging and holding a can inserted therein, and thus the can need not be inserted fully into a cup-shaped connector as shown in full lines.

An elbow coupler 45 is shown in FIGS. 24 and 25 and comprises a pair of tubular connectors 46 and 47 integrally joined together at adjacent ends thereof and extending perpendicularly from one another.

Retaining flanges 48 and 49 of substantially the same construction as the flange 2' shown in FIG. 8, for example, are on the outer ends of each of the connectors 46 and 47, respectively, and a pair of radially projecting lugs or ears 50 and 51 project from each of the retaining flanges 48 and 49 for receiving the edges of a panel P.

Two forms of decorative rings R1 and R2 are shown in FIGS. 26 and 27, respectively. The rings R1 and R2 are positionable about a can C intermediate the ends thereof to enhance the aesthetic effect of a structure made in accordance with the invention.

A modified form of end cap E'' is illustrated in FIGS. 28 and 29 and has a substantially flat, planar disc-shaped end wall 1 with a central axially projecting button or stop 3 as in the first described form of end cap, but rather than a short cylindrical flange or wall 2 as in the first described form of end cap, the end cap E'' has a long wall 2'' with a circular or cylindrical inner configuration O and a rectangular outer configuration. The lower or open end of the side wall 2'' is turned radially inwardly to define a lip or flange 4 as in the previous embodiment and a plurality of notches or grooves 17 are formed through the lip to enable air to escape from the interior of the end cap when it is placed over the end of the can C.

A modified coupler S'' is illustrated in FIGS. 30 and 31 and is substantially identical to the coupler S except that relatively long walls or flange 2'' extend from opposite sides of the central web 1' and the outer or open ends of the walls 2'' are turned radially inwardly as at 4 to define a retaining flange for holding the end of an associated can therebehind. The configuration of the coupler S'' is similar to the configuration of the end cap E'' in that the hollow interior of the coupler has a circular or cylindrical configuration as at O and the exterior of the coupler has a rectangular or square configuration. Notches or slots 17 are formed through the lip 4 for enabling air to escape from the interior of the coupler when cans C are inserted thereinto.

In FIGS. 32 and 33, a modified angle coupler A6' similar to the angle coupler A6 is illustrated, and this form of angle coupler is substantially identical to the angle coupler A6 except that the exterior configuration of the angle coupler A6' is rectangular or square in shape and comprises a first connector 34' joined in right angular relationship to a second connector 35', each of the connectors having circular or cylindrical openings or bores O therein for receiving an associated can C. The connectors have elongated walls or flanges 2'' thereon which surround the end portion of a can C inserted within the cylindrical bores or openings O.

In FIGS. 34, 35 and 36, a modified form of angle coupler A1' is illustrated and is similar to the angle coupler A1 shown in FIG. 1. The angle coupler A1' differs from the angle coupler A1 in that it has relatively long walls or flanges 2'' extending in opposite directions from the web 1', and the outer configuration of the coupler A1' is rectangular rather than circular as in the form of coupler shown in FIG. 1.

In FIG. 37 a modular structural element 52 for use in constructing articles of furniture and the like is illustrated and comprises a plurality of cans C superposed one upon the other and releasably joined together in end-to-end relationship by a plurality of the unique coupler means S. An end cap E is positioned over the outer end of the end most cans in the column of cans, and the bottom most can may be filled with a suitable ballast material 53, such as sand or the like, if desired. The structural element 52 may be used as a standard or base for supporting an item such as an ashtray, table top, lamp, or the like, as illustrated in FIGS. 38 through 43.

A lamp L constructed in accordance with the invention is shown in FIG. 38, and comprises a plurality of cans C joined together in superposed, end-to-end relationship by a plurality of couplers S. A relatively large can, such as a typical one gallon can C' comprises the bottom most can in the lamp and is joined to the remaining cans C by a reducing coupler SR'. Suitable ballast 53 such as sand or the like is in the bottom can C' to prevent tipping of the lamp.

In FIG. 39, a table T is shown constructed in accordance with the invention and includes four legs or columns 54, each comprising a plurality of cans C joined together in superposed end-to-end relationship by a plurality of the in-line couplers S. An angle coupler A1 is connected between the bottom most and the next adjacent can in each column or leg 54, and a brace 55,

comprising a plurality of cans C connected together in end-to-end relationship by a plurality of in-line couplers S, is connected at its opposite ends with the angle coupler A1 in the legs at the opposite ends of the table.

A further brace **56** extends between the brace **55** at the opposite ends of the table and is joined to the braces **55** intermediate the ends thereof by a pair of angle couplers A1.

A bookcase or bookshelf B is shown in FIGS. **40** and **41** and comprises a plurality of pairs of cans C connected together in end-to-end relationship by in-line couplers S, with two pairs of cans C arranged in parallel, spaced apart relationship between pair of shelves **57**, such as boards or planks, at spaced intervals along the length of the shelves **57**. The pairs of cans C have end caps E on the opposite ends thereof in engagement with the shelves **57**, and as many alternate layers of cans C and shelves **57** can be provided as desired to obtain a particular size bookcase. a plurality of single cans C with end caps E on opposite ends thereof are arranged beneath the bottom shelf **57** in supporting relationship thereto. Different numbers of cans arranged end-to-end, or different size cans can be used between the shelves **57** to effect different spacing between the shelves, as desired.

A room divider or screen or the like D is shown in FIG. **42** and is comprised of a plurality of columns of cans C connected together in end-to-end superposed relationship by means of a plurality of couplers S''', each of which has a pair of protruding ears or lugs **5** and **6** thereon between which are received the opposite edges of a plurality of panels P. Horizontally arranged pairs of interconnected cans also extend between the adjacent columns of cans for engaging the top and bottom edges, respectively, of the panels P, and the horizontally disposed cans are joined to the columns of vertically disposed cans by means of angle couplers A1. The number and arrangement of the cans can be varied to effect different designs of the room divider.

In FIG. **43**, a yieldable spacer means **58** is shown and comprises a pair of telescopically engaged members **59** and **60** resiliently biased apart by a spring **61** interposed therebetween. The spacer means **58** is connected with the top most can C in the columns of cans by an in-line coupler S. The spacer **58** serves to permit the room divider or screen or the like D to be positioned between the floor and ceiling of a room, for example, wherein the telescopically engaged members **59** and **60** may be either moved toward one another or allowed to be urged apart to accommodate different dimensions or distances between the floor and ceiling or the like. The yieldable spacer insures a snug, friction-tight fit of the columns of cans between the floor and ceiling or the like of a room and the screen or divider D is accordingly securely supported in operative position.

Articles of furniture and the like constructed in accordance with the invention can be given different aesthetic effects, as desired, by painting the cans and connectors and the like with a suitable paint or the cans may be covered with a Contac Paper or similar material for giving the cans a desired texture and appearance, such as a wood grain appearance, or the cans may be left in their original condition with the labels showing to achieve a desired effect.

As this invention may be embodied in several forms without departing from the spirit or essential characteristics thereof, the present embodiment is therefore illustrative and not restrictive, since the scope of the invention is defined by the appended claims rather than by the description preceding them, and all changes that fall within the metes and bounds of the claims or that form their functional as well as conjointly cooperative equivalents are therefore intended to be embraced by those claims.

What is claimed is:

1. An article, comprising a plurality of connected together discarded cans, and a plurality of separate, resilient connecting members connected to adjacent ends of adjacent cans securing the cans together in desired relationship, said connecting members including an angle coupler, said angle coupler comprising a first, circular, disc-shaped web, an annular, peripheral flange integral with the web on at least one side thereof and projecting axially therefrom and engaging and holding the end of a can positioned within said flange, and at least one other circular, disc-shaped web integrally joined to said flange at one edge of said first web in right angular relationship thereto, an annular, peripheral flange integral with said other web and projecting axially therefrom and engaging and holding an end of another can positioned within said flange.

2. An article as in claim **1**, wherein an inturned lip is on the edge of each flange engaging and holding the end of an associated can behind said flange means.

3. An article as in claim **1**, wherein at least another of said connecting means comprises a reducing coupler joining together a pair of cans of different diameter, said reducing coupler including a circular, disc-shaped web increasing in thickness toward the periphery thereof, an annular peripheral flange extending axially from one side of said web, a radially inturned lip on the edge of said flange engaging and holding the end of an associated large can received behind said flange, and a second, diametrically smaller, annular flange projecting axially from the other side of said web and having a radially inturned lip on the edge thereof engaging and holding the end of an associated smaller can therein.

4. An article as in claim **1**, wherein there are three substantially identically formed connecting members each integrally joined adjacent one edge thereof with the flange of said first web at equally spaced points about the circumference thereof, said three connecting members each comprising a disc-shaped web and an annular, peripheral flange projecting axially from one side thereof, said webs lying in planes parallel to the axis of said first web and with the flanges thereof extending outwardly away from said first web.

5. An article as in claim **4**, wherein a central projection is on the web of each of said connecting members integrally joined to the flange of said first web, said projections each in engagement with an end of an associated can.

6. An article as in claim **1**, wherein said angle coupler comprises a first pair of axially aligned connecting members lying in spaced, parallel planes, a second pair of axially aligned connecting members lying in spaced parallel planes on opposite sides of said first pair of connecting members in perpendicular relationship thereto and integrally joined to said first pair of connecting members at adjacent edges thereof, a third pair of axially aligned connecting members lying in spaced, parallel planes above and below said first and second pair of connecting members in perpendicular relationship thereto and integrally joined thereto at the adja-

cent edges thereof, each of said connecting members having a disc-shaped web with an axially projecting annular peripheral flange extending outwardly therefrom receiving and holding the end of an associated can therein, and a central projection extending axially from each web on the same side thereof as the flange, engaging the end of an associated can to space the web from the end of the can.

7. An article as in claim 1, wherein an annular peripheral flange projects axially from each of the opposite sides of said first web, and three connecting members each having a disc-shaped web are integrally joined at the mid-portion of one side of their webs to the flange on said first web at three equally spaced points about the circumference thereof, said connecting members each having an annular peripheral flange projecting axially from the other side of said web and each lying in a plane perpendicular to the plane of said coupler member.

8. An article as in claim 7, wherein a central projection is on the web of each of said connecting members integrally joined to the flange of said first web, said projections each in engagement with an end of an associated can.

9. An article as in claim 1, wherein an annular peripheral flange projects axially from each of the opposite sides of said first web, the outer marginal surface of said flanges being rectangular and having opposite, straight sides, and three connecting members each having a disc-shaped web integrally joined across the middle thereof to a respective opposite, straight side of said flange on said first web, said connecting members each having an annular peripheral flange projecting axially from one side of the web and each lying in a plane perpendicular to the plane of said first web.

10. An article as in claim 9, wherein a central projection is on the web of each of said connecting members integrally joined to the flange of said first web, said projections each in engagement with an end of an associated can.

11. A connecting means as in claim 1, wherein each of said flanges is elongate in an axial direction and has a rectangular outer configuration and a circular or cylindrical inner configuration.

12. An article as in claim 11, wherein a flange projects axially from each of the opposite sides of said first web.

13. An article as in claim 1, wherein a flange projects axially from each of the opposite sides of said first web.

14. An article as in claim 1, wherein a central projection is on said first web on the same side thereof as said flange, said projection in engagement with the end of the can received in said flange.

15. An article, comprising a plurality of connected together discarded cans, a plurality of resilient connecting means connected to adjacent ends of adjacent cans securing the cans together in desired relationship, at least one of the connecting means including a circular disc-shaped web, an annular, peripheral flange integral with the web on each of the opposite sides thereof and projecting axially from the opposite sides of the web, each flange receiving and holding the end of an associated can therein, a plurality of circumferentially spaced, axially extending grooves in the circumferential outer surface of the said one connecting means, said grooves extending completely across the axial extent of said flanges, and at least one panel means received and held at an edge portion thereof in one of said grooves, with the plane of said panel means parallel to the axis of said one connecting means and said associated cans.

16. An article, comprising a plurality of connected together discarded cans, a plurality of resilient connecting means connected to adjacent ends of adjacent cans securing the cans together in desired relationship, said connecting means including an angle coupler, said angle coupler comprising a pair of hollow, cylindrical connectors integrally joined together at one end thereof in right angular relationship to one another, one end of a can received and held in each of said cylindrical connectors, a pair of radially projecting, closely spaced lugs on the outer surface of the other end of each of said cylindrical connectors, said pair of lugs lying in substantially the same plane, and a panel means having a pair of mutually perpendicular edges, said edges received and held between the respective pairs of lugs.

17. An article as in claim 12, wherein a central projection is on the web of said end cap on the same side thereof as said flange, said projection being in engagement with the end of the end most can to space the web from the end of the can and maintain it in substantially flat, planar relationship.

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