

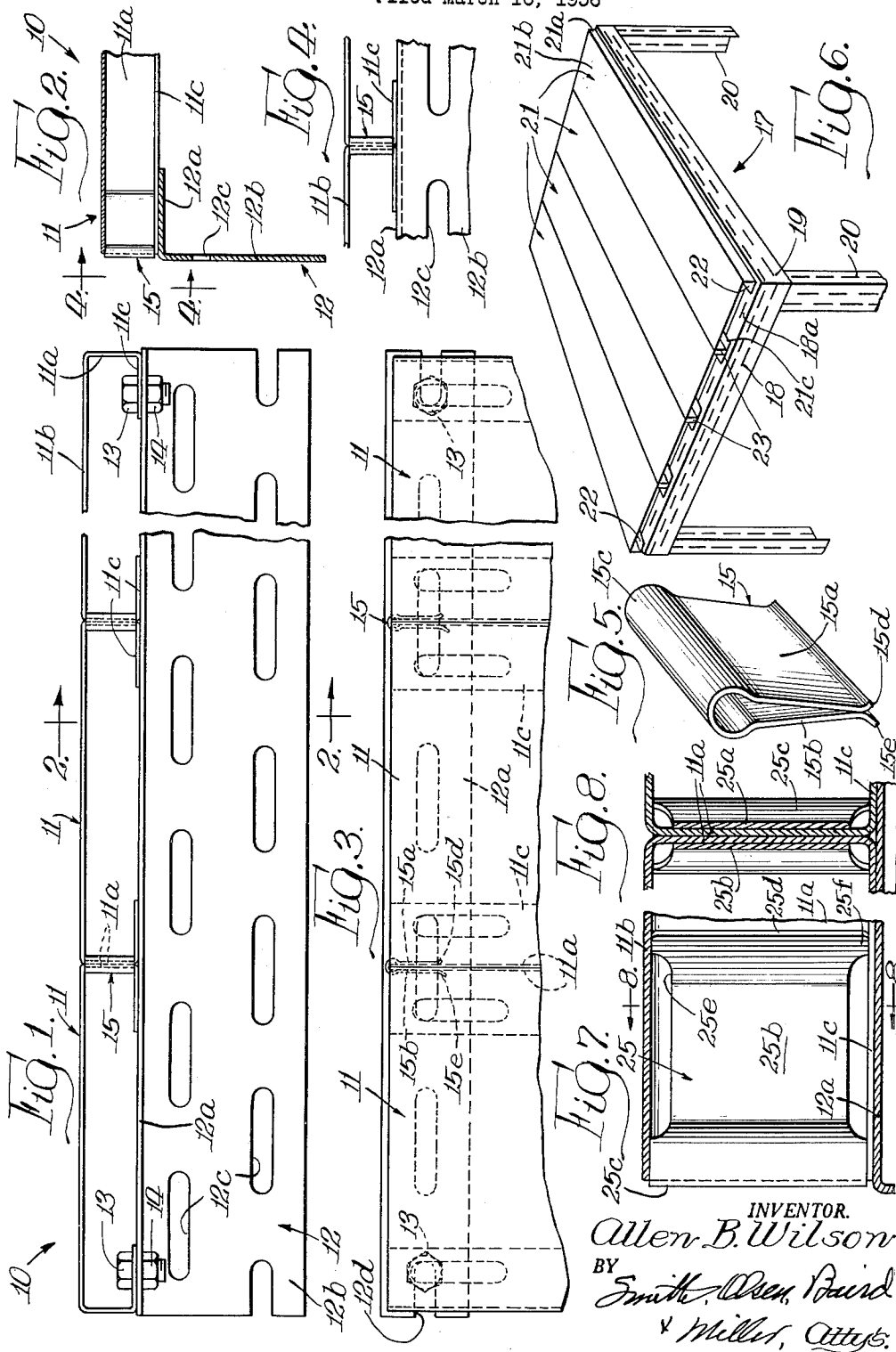
Sept. 12, 1961

A. B. WILSON

2,999,569

PANEL CONSTRUCTION

Filed March 16, 1956



INVENTOR.  
Allen B. Wilson  
BY  
Smith, Owen, Baird  
& Miller, Attys.

1

2,999,569

## PANEL CONSTRUCTION

Allen B. Wilson, Chicago, Ill., assignor to Acme Steel Company, Chicago, Ill., a corporation of Illinois  
Filed Mar. 16, 1956, Ser. No. 571,991  
2 Claims. (Cl. 189—35)

This invention relates to improvements in shelf structure and the like and its purpose is to provide novel constructional elements and combinations thereof adapted to be employed in industrial establishments such as manufacturing plants, warehouses, etc., in forming shelves, racks, platforms, tables, bins and the like and for other general utility purposes.

One object of the invention is to provide a novel structure comprising metal panels which may be secured together in any desired number to provide areas of suitable extent to support the goods to be stored. Another object is to provide a novel structure comprising metal panels which are secured together by novel metal clips or connectors, whereby the panels may be quickly and securely connected. A further object is to provide metal panels secured together by connectors which act to reinforce the panels to sustain the load carried thereby. Still another object of the invention is to provide a novel structure comprising metal panels which are secured together by novel metal connectors which automatically locate the top surfaces of the panels in the same horizontal plane. Other objects relate to various features of construction and arrangement which will appear more fully hereinafter.

The nature of the invention will be understood from the following specification taken with the accompanying drawings in which the structural elements and certain combinations thereof are illustrated. In the drawings,

FIGURE 1 shows an end elevation of a shelf constructed according to the present invention;

FIG. 2 shows a vertical section taken on the line 2—2 of FIG. 1;

FIG. 3 shows a top plan view of a portion of the structure illustrated in FIG. 1;

FIG. 4 shows an end elevation taken on the line 4—4 of FIG. 2;

FIG. 5 is a perspective view of one form of connector constructed according to the present invention which is embodied in the assembled structure shown in FIGS. 1 to 4, inclusive;

FIG. 6 is a perspective view of a table embodying the features of the present invention;

FIG. 7 is a sectional view taken through the edge portion of a panel illustrating an inside elevation of a modified form of connector for securing two adjacent panels together; and

FIG. 8 is a sectional view taken on the line 8—8 of FIG. 7.

As illustrated in FIGS. 1 to 4 inclusive, the invention is embodied in the construction of what may be regarded as a shelf 10 made up of a series of sheet steel panels 11 which rest upon angle bar supports 12. Each panel 11 has two depending side walls 11a which are at right angles to the flat body portion 11b of the panel and the lower edge of each side wall 11a has integrally formed therewith an inwardly directed flange 11c which lies in a plane parallel to the body portion 11b. The two flanges 11c of each panel are directed inwardly toward each other and they are adapted to rest directly upon the top flanges 12a of the supporting members 12. The supporting members 12 are preferably provided with downwardly extending flanges 12b which are provided with two rows of elongated slots 12c, the slots of one row being staggered with respect to the slots of the other row. These slots are provided to facilitate the connection of the supports 12

2

to upwardly extending pedestals or frame members at any desired points. Two or more supports 12 may be provided for each shelf 10.

The outermost flanges 11c of the outermost panels 11 are secured to the top flanges of the supports 12 by means of bolts 13 and nuts 14, the bolts being arranged to engage elongated slots 12d which are formed in the top flanges 12a. It is ordinarily sufficient to use bolts or the like for attaching only the outer parts of the outermost panels 11 to the supports 12 on which they rest.

All of the panels 11 are secured in place and to each other by connectors in the form of spring clips 15 having the form shown particularly in FIG. 5. These connectors are adapted to embrace the ends of the side walls 11a of adjacent panels 11 between the body portions 11b and the flanges 11c so that the adjacent side walls of adjacent panels are held securely in contact with each other while, at the same time, all of the panels are maintained in contact with the flanges 12a of the supports by reason of the connection of the outermost panels to these supports through the bolts 13 and nuts 14.

Each connector 15 is in the form of a spring clip having two arms 15a and 15b which are in the form of flat, resilient steel plates connected by an integrally formed tubular portion 15c. When a spring clip is detached from an assembly, as shown in FIG. 5, the arms 15a and 15b converge toward each other and contact with each other at points spaced inwardly from their free edges. The two arms 15a and 15b are of different lengths and are curved outwardly at their free edges as shown at 15d and 15e, respectively, so that the free edges diverge away from each other to facilitate the movement of the spring clip to embrace the side walls of two adjacent panels. The dimension of the U-shaped portion 15c is preferably such in relation to the thickness of the side walls 11a of the panels that the arms 15a and 15b will lie parallel to each other and in substantially continuous contact with the oppositely directed faces of adjacent side walls 11a when the clip has been moved to a position, such as that shown in FIG. 3, where the side walls extend between the arms 15a and 15b into the tubular cavity of the U-shaped portion 15c.

The dimension of each clip 15, measured parallel to the axis of the U-shaped portion 15c, is preferably such that, when the clip is inserted into engagement with the side walls of adjacent panels, as shown in FIGS. 1 and 3, the clip will fit between the body portions 11b and the flanges 11c of two adjacent panels and thus reinforce the panels while at the same time more securely hold the clips in position with respect to the panels. In this way, there is provided a novel form of construction which may be readily assembled and which comprises parts capable of being readily secured together with a minimum use of fastening devices, such as bolts, nuts, and the like.

In FIG. 6 of the drawings, there is shown the use of the present invention in the formation of a table 17 comprising frame members 18 which are all slotted angle bar forms similar to the supports 12 and which are secured together at their meeting ends, at which points they are also secured by bolts 19, or the like, to upwardly extending legs 20. These legs 20 may also preferably be formed of slotted angle bar construction. The top flanges 18a of the frame members 18 have secured thereto a plurality of panels 21 which are similar to the panels 11, each comprising depending side walls 21a which extend downwardly from the flat body portions 21b and which have inwardly turned flanges 21c at their lower edges. These flanges at the outer edges of the outermost panels 21 are secured by bolts 22 and nuts (not shown) to the top flanges 18a of the frame members. The intermediate side walls 21a of the panels 21 are secured to each other at the places where the side walls of adjacent

panels contact, by means of spring clips 23 which are constructed like the spring clips 15 previously described.

In FIGS. 7 and 8 of the drawings there is shown a modified form of connector 25 for securing the side walls of adjacent panels together. This form is constructed of resilient metal and comprises arms 25a and 25b which are connected by an arcuate or U-shaped portion 25c formed integrally with the arms and adapted to force the arms against the side walls 11a of the panels when the arms are inserted between the top walls 11b and the bottom flanges 11c of adjacent panels. The free ends of the arms 25a are flared away from each other as shown at 25d and the upper and lower edges of the arms are cut away from points somewhat within the portions 25c and extend to points adjacent to the free ends of the arms as shown at 25e, thus leaving projections 25f extending vertically at the ends of the arms and bearing against the flat surfaces of the top walls 11b and the bottom flanges 11c. The cutting away of the edges of the arms 25a at their top and bottom edges avoids any interference between the arms and the panels where the metal of the panels is curved at the junctures of the walls 11a with the parts 11b and 11c, so that the arms 25a may lie in flat contact with the walls 11 from the outer edges of the walls inwardly and thereby more securely hold adjacent panels together.

Both of the connectors 15 and 25 have the advantage that both arms of each connector are of the same dimension as the spaces between the top walls and the lower horizontal flanges of the panels so that, when the clips are in place embracing adjacent panel walls, they not only secure adjacent panels together but also locate the top surfaces of the top walls of the connected panels in the same horizontal plane.

The structural elements of the present invention have been shown and described in certain structural assemblies which illustrate the use and advantages of the present invention; but it will be understood that the invention may have various other forms which come within the scope of the appended claims.

#### I claim:

1. A structure comprising a plurality of panels, each panel having a substantially flat body portion, the adjacent edges of adjacent panels having side walls formed thereon and disposed substantially perpendicular thereto and terminating in juxtaposed free ends, inwardly directed flanges formed on each of said side walls and extending therefrom in the same direction as the associated body portion and substantially parallel thereto, and a clip interconnecting adjacent panels, said clip including two resilient arms connected by a U-shaped resilient portion, said U-shaped portion being disposed about the free ends of two adjacent side walls and having an inner maximum dimension greater than the combined thickness of said side walls, said arms pressing against the oppositely directed faces of said adjacent side walls of adjacent panels and lying flat thereagainst for the major part of the length of said arms, the edge of said U-shaped portion and the edge of the outer ends of said arms on each side of said clip lying in a common plane and the planes defined by said edges being parallel and spaced apart a distance equal to the space between said body portion and said flange, whereby portions of said arms extend between and are in contact with the associated flange and the adjacent face of the associated body portion, the ends of said arms opposite the U-shaped portion being directed outwardly away from the associated side

wall to facilitate assembly therewith, said edges of said U-shaped portion of said clip and said edges of said outer ends of said arms on each side of said clip being spaced from said adjacent side walls and contacting said body portions and said flanges of said panels at points disposed outwardly of said side walls, all portions of said arms of said clip which are intermediate said U-shaped portion and said outer ends and which are in contact with said side walls of said panels being of reduced width and out of contact with said body portions and said flanges of said panels, said clip serving to hold said adjacent panels firmly together with the surfaces of said body portions lying in common planes.

2. A clip for use in interconnecting a pair of panels, each of which panels has a flat body portion with a side wall formed thereon perpendicular thereto and an inwardly directed flange on the side wall extending therefrom in the same direction as the body portion and substantially parallel thereto and with the side wall joined to the body portion and flange by curved junctures, said clip comprising two resilient arms connected by a U-shaped resilient portion, said U-shaped portion being adapted to be disposed about the free ends of two adjacent ones of said side walls and having an inner maximum dimension greater than the combined thickness of said side walls, said arms normally converging toward each other and contacting each other adjacent their free ends when not in use and in use being adapted to press against the oppositely directed faces of said adjacent side walls of adjacent panels and adapted to lie flat thereagainst for the major part of the length of said arms, an edge of said U-shaped portion and an edge of the free end portions of said arms on each side of said clip lying in a common plane and the planes defined by said edges being parallel, said free end portions of said arms being directed outwardly away from each other, all intermediate portions of said arms of said clip intermediate said U-shaped portion and said free end portions being of reduced width with the opposite edges of said intermediate portions spaced inwardly of said planes so as to clear said curved junctures, the opposite edge portions of said U-shaped portion and said free end portions immediately adjacent said intermediate portions also being spaced inwardly of said planes so as to clear said curved junctures.

#### References Cited in the file of this patent

##### UNITED STATES PATENTS

|           |                |                |
|-----------|----------------|----------------|
| 90,055    | Shoemaker      | May 11, 1869   |
| 255,013   | Oleson         | Mar. 14, 1882  |
| 298,381   | Holden         | May 13, 1884   |
| 944,022   | Eken           | Dec. 21, 1909  |
| 977,794   | Griswold       | Dec. 6, 1910   |
| 1,681,830 | White          | Aug. 21, 1928  |
| 1,758,307 | Bales          | May 13, 1930   |
| 1,809,153 | Barrett        | June 9, 1931   |
| 1,845,268 | Harvey         | Feb. 16, 1932  |
| 2,150,497 | Fernberg       | Mar. 14, 1939  |
| 2,269,782 | Fischer et al. | Sept. 22, 1942 |
| 2,502,849 | Jennings       | Apr. 4, 1950   |
| 2,618,086 | Komorous       | Nov. 18, 1952  |
| 2,685,372 | Palaith        | Aug. 3, 1954   |
| 2,742,116 | Fitzgerald     | Apr. 17, 1956  |

##### FOREIGN PATENTS

|         |               |                |
|---------|---------------|----------------|
| 170,013 | Switzerland   | Sept. 1, 1934  |
| 608,399 | Great Britain | Sept. 15, 1948 |