

Sept. 30, 1952

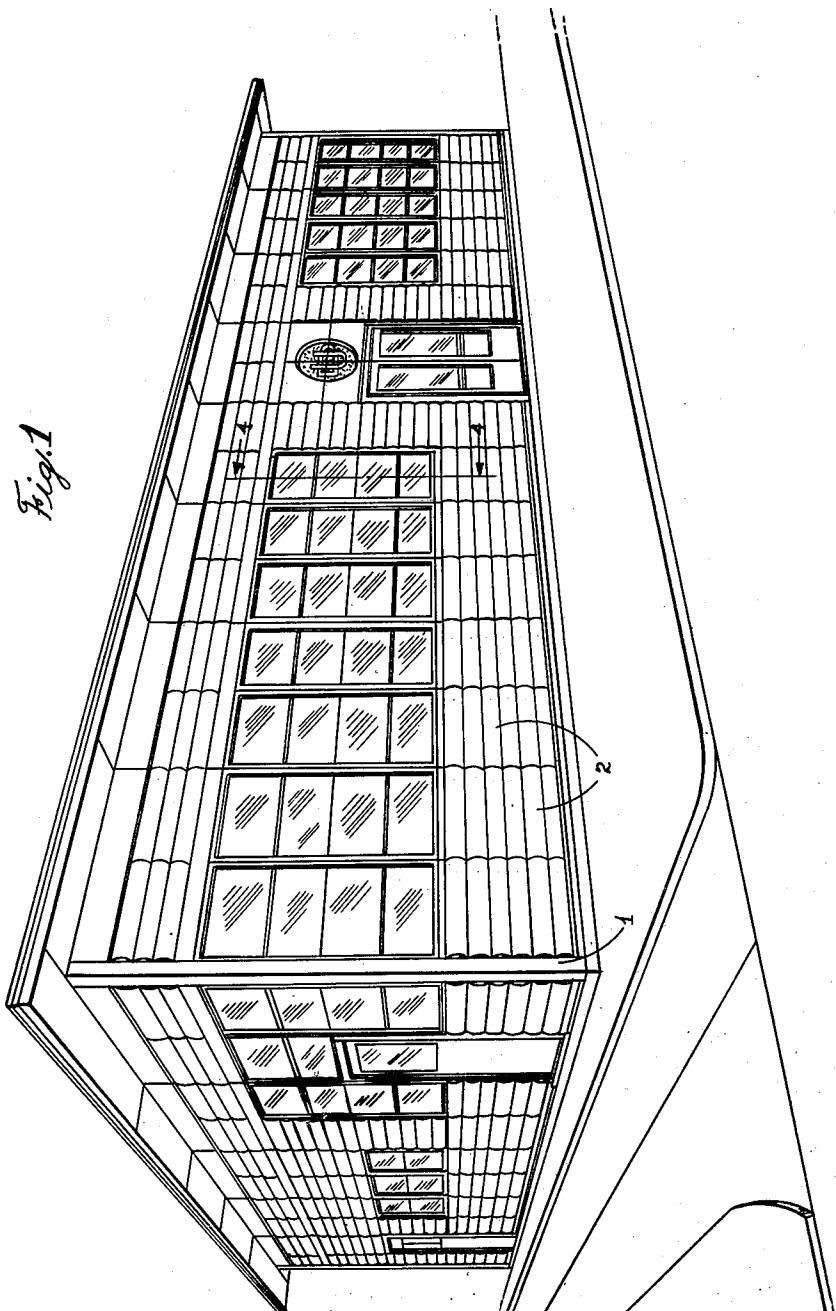
I. P. WHITEHOUSE ET AL

2,612,246

WALL CONSTRUCTION

Filed Nov. 9, 1945

3 Sheets-Sheet 1



INVENTORS
IRVING P. WHITEHOUSE
WOLFGANG W. KRAUSS
& AUSTIN G. DAMON.

BY *Rickey Watts*
ATTORNEYS

Sept. 30, 1952

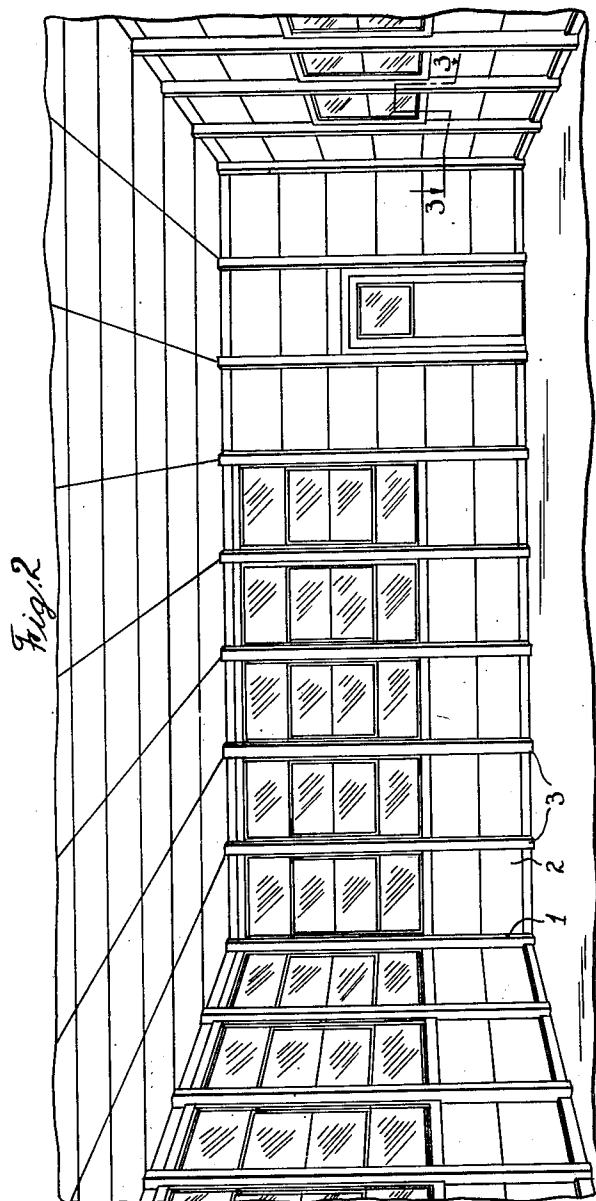
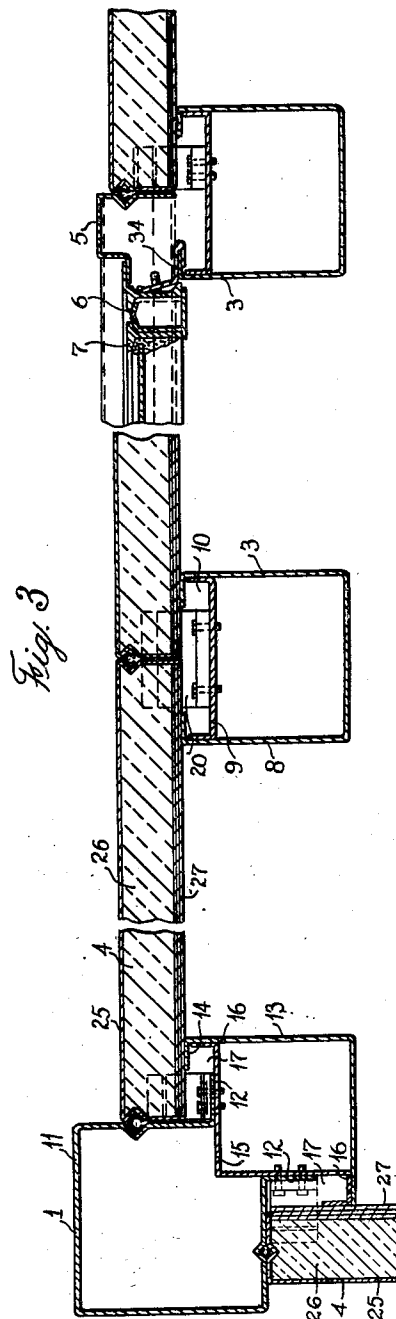
I. P. WHITEHOUSE ET AL

2,612,246

WALL CONSTRUCTION

Filed Nov. 9, 1945

3 Sheets-Sheet 2



INVENTORS
IRVING P. WHITEHOUSE,
WOLFGANG W. KRAUSS
& AUSTIN G. DAMON

BY

Richy Watts
ATTORNEYS

Sept. 30, 1952

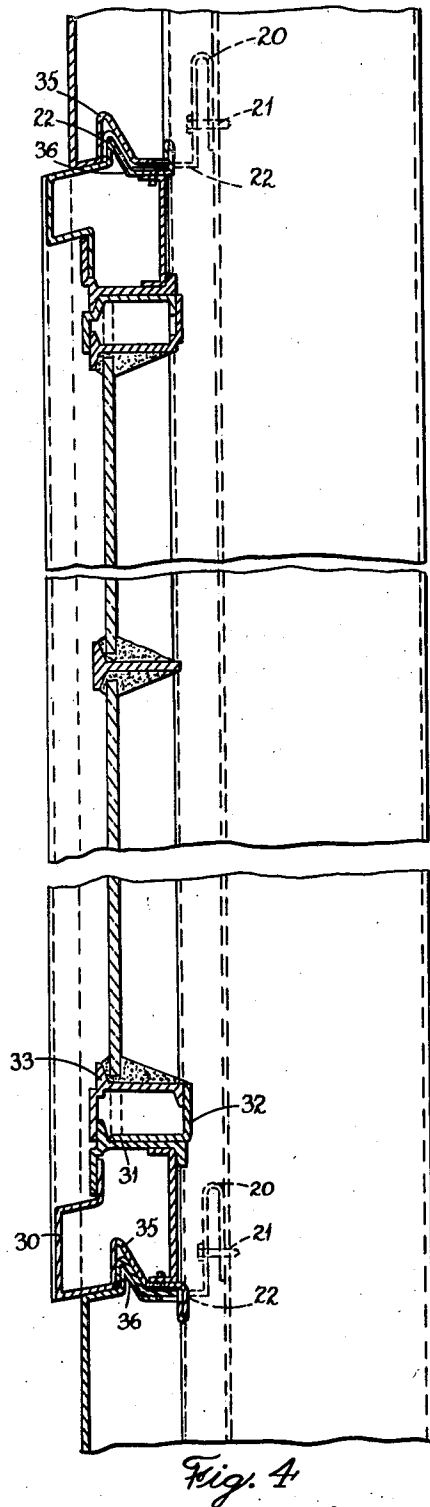
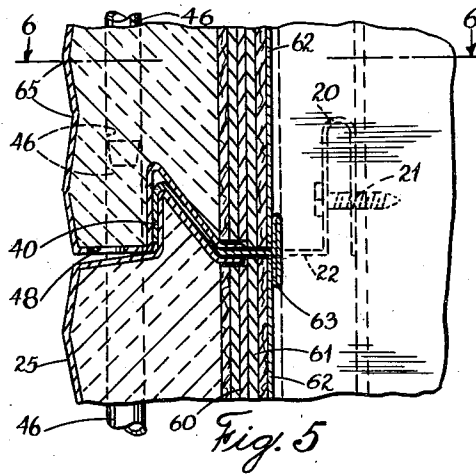
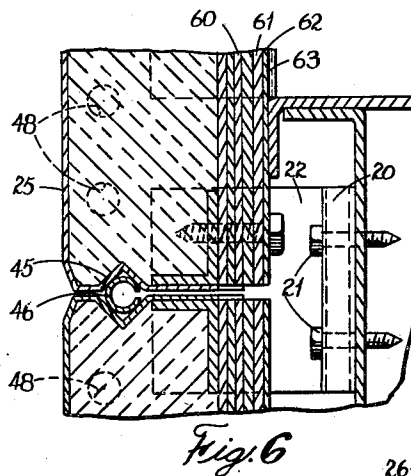
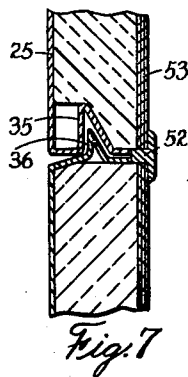
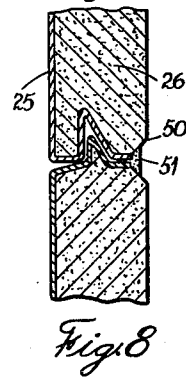
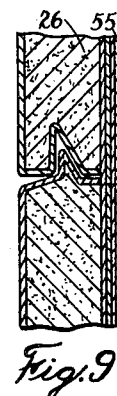
I. P. WHITEHOUSE ET AL

2,612,246

WALL CONSTRUCTION

Filed Nov. 9, 1945

3 Sheets-Sheet 3



INVENTORS
IRVING P. WHITEHOUSE,
WOLFGANG W. KRAUSS
& AUSTIN G. DAMON

BY *Richy Watts*
ATTORNEYS

UNITED STATES PATENT OFFICE

2,612,246

WALL CONSTRUCTION

Irving P. Whitehouse, South Euclid, Wolfgang W. Krauss, Aurora, and Austin G. Damon, Lakewood, Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio, a corporation of New Jersey

Application November 9, 1945; Serial No. 627,668

6 Claims. (Cl. 189-88)

1

The present invention relates to building construction and more particularly the construction of walls of low cost industrial buildings.

The present invention aims to provide substantial, inexpensive, attractive wall construction for buildings, such as warehouses, shops, stores, gas stations, office buildings and similar structures. It achieves these objects by employing a plurality of structural columns and mounting a plurality of panels against the outer sides of the columns. Both columns and panels may be made on a production basis and are strong and durable. This invention also aims to provide heat insulation when desired. The heat insulating objective is obtained by including heat insulating materials in the panels of such buildings as are to be insulated and thus preventing the passage of air and conduction of heat thru the building wall. The inclusion of the heat insulation involves no basic alteration of the structure of the panels and may be included or omitted depending on the results desired.

The attractiveness or pleasing appearance objective is achieved by the use of various finishing materials which may be applied to the surfaces of the panels and columns.

The present invention and its accomplishments will be better understood from the following description and the drawings which accompany this specification and in which,

Figure 1 is a perspective view of a building embodying the present invention;

Figure 2 is a fragmentary, perspective, inside view of the building of Fig. 1;

Figure 3 is a horizontal sectional view taken on line 3-3 of Fig. 2 with parts broken away;

Fig. 4 is a vertical sectional view taken on line 4-4 of Fig. 1;

Fig. 5 is a fragmentary, vertical sectional view of a panel embodying this invention;

Fig. 6 is a sectional view taken on line 6-6 of Fig. 5;

Fig. 7 is a fragmentary, sectional view of adjacent wall panels with covering on their inner sides and a molding strip between their adjacent horizontal edges;

Fig. 8 is a view similar to Fig. 5 but showing panels having composite material in the space between the horizontal edges of the panels near their inner surfaces; and

Fig. 9 is a view similar to Figs. 7 and 8 but showing a multiple layered covering for the inner surfaces of the panels.

As will be seen from Fig. 1, the building there illustrated includes a plurality of corner columns 1 and horizontal wall panels 2, some of which

2

include window sash and frames and others of which include door sash and frames. Fig. 2 shows the corner columns 1 and panels 2 of Fig. 1 and also shows a plurality of intermediate columns 3 between pairs of which the panels 2 extend.

Fig. 3 shows one corner column 1, two intermediate columns 3, solid panels 4 and a panel 5 including a window frame 6 and sash 7.

The intermediate structural columns 3 are formed from rolled and bent sheet metal parts 8 and 9. Part 9 is secured within part 8 and provides a recess 10 on the outer side of the column. Each corner column 1 consists of an outer and an inner column with the inner column projecting into the inner corner of the outer column. The outer column is formed from rolled metal 11 bent into substantially rectangular shape but with an open inner corner and flanges 12 extending therefrom. The inner column is formed from rolled metal part 13 bent into right angle shape with marginal flanges 14 and rolled right angle part 15 having marginal flanges 16 to rest against part 13; near flanges 14 and against flanges 12 of the outer column. Recesses 17 are defined on the outer side of the inner column by flanges 14 and the opposed wall of the outer column.

Spring clips 20 (see also Figs. 4, 5 and 6) are secured by screws 21 in the recesses 10 of the columns at heights corresponding to the upper edges of the panels 2. These clips are U-shaped with one leg bearing against the column and with a portion 22 extending from the other leg outwardly into the horizontal spaces between adjacent panels for a purpose presently to appear.

Each of the solid panels 4 is rectangular and includes a box-like metal shell 25 having an open inner side. When heat insulating properties are desired filler 26 preferably composed of heat insulating material such as Celotex, fibre glass, light weight concrete, cimento board, or plastic material may be included in the panels. In some instances the inner surface of the filler may have a covering 27.

In the case of the window panel 5, the panel includes a hollow rectangular metal body 30 (Fig. 4) provided along its inner margin with flanged structural members 31 and 32 against which the sash 33 of the window frame may contact when in closed position. Spring clips 34 (Fig. 3) which engage flanges 14 on the corner columns, or corresponding flanges on the intermediate columns, serve to retain members 31 in proper position relative to the sash member 33. If de-

3

sired, members 31 and 32 may be made in one piece.

Each of the wall panels 2, 4 and 5 is provided with grooves 35 extending longitudinally along their lower horizontal edges and corresponding projections 36 extending longitudinally of their upper horizontal edges. These grooves and projections, as shown in Figs. 4, 5 and 7 to 9 are V-shaped. The grooves 35 are formed by suitably indenting or deforming the thin metal shell 25 or 30 of the panels and the projections 36 are formed by deforming the shell outwardly. When two panels are assembled vertically one above the other the projection on the upper surface of the lower panel extends into the groove of the upper panel and thus the projection and groove locate two adjacent panels relative to each other. Portions 22 of clips 20 extend into the space between the projections 36 and grooves 35 of adjacent panels and preferably embrace the projections, as is illustrated in Figs. 4 and 5. When the clip retaining screws 21 are tightened, the leg of the clip to which portion 22 is connected is deflected inwardly toward the column and portion 22 is pressed downwardly and inwardly. As a result, portion 22 presses the panel therebelow down against the next lower panel and also pulls it against the column thereby closing cracks or spaces between the panel and a lower panel, as well as the column. This prevents rattling and passage of air between the panels and columns. The horizontal space between two vertically arranged panels is sealed by any suitable sealing material 40 (Fig. 5) and such material extends from one side of clip 20 to the opposed side of the next adjacent clip 20 and thereby seals the horizontal space between the two panels from within the projection of one column to within the projection of the next column.

The vertical edges of the panels are provided with notches 45 which may be made by deforming the shell 25. These notches extend lengthwise of the vertical edges of the panels and, as shown in Fig. 6, are preferably triangular in cross-section but may be of various cross-sectional shapes. When two adjacent panels are brought into assembled position the notches in the opposed vertical edges of the panels define a vertical space in which sealing means may be positioned. As shown in Fig. 6, a preferred form of sealing means is a corrosion-resistant, longitudinally split, resilient tube 46 which may be composed of copper, brass or the like. These tubes are compressed slightly between the adjacent panels so that they make good sealing contact with the panels and prevent the flow of fluid between the vertical edges of the panels. Preferably, each tube 46 extends from some little distance above the bottom edge of its panel to some little distance above the top edge of the panel so that there will be no break between the tubes at the horizontal space between the panels. The lower end of one tube is preferably tapered slightly so that it will telescope into the upper end of the next lower tube.

Means are provided for removing any moisture which may form in or find its way into the panel liners. As is shown in Figs. 5 and 6, this means comprises weep holes 48 in the lower parts of the liner shells to permit moisture to escape from the porous liner material.

The panels may be provided with various trims and coverings on their inner sides. Fig. 8 shows a simple form of trim in which the horizontal edges of the panel fillers 26 are beveled at 50 and

4

a trim strip 51 is located in the space provided by those beveled surfaces. This strip 51 may consist of various materials, such as any suitable plastic, cement or the like.

Fig. 7 shows a molding strip 52 and inside coverings 53 for the panels. The coverings 53 may consist of various materials such as Transite, plywood or the like, and these coverings are co-extensive vertically with each panel and cover the panels horizontally between the opposed surfaces of the columns. Preferably, the strips 52 are composed of metal, such as stainless steel, altho suitable plastic material may be used if desired, and these strips may be painted or otherwise colored.

In Fig. 9 the liners 26 have their inner surfaces covered with multiple layered coverings. In this instance four layers 55 of plywood are shown and the upper horizontal edge of this covering is flush with the upper edge of the liner while the lower edge of the covering on one panel extends to below the lower edge of the liner and abuts against the upper edge of the covering on the next lower panel. Since the coverings abut, no space is provided for horizontal trim strips. Covering 55 may extend from one vertical edge of the panel to the opposite vertical edge if desired, or may merely extend between the opposed surfaces of the two columns supporting the panel.

Still another type of covering and trim strip combination is shown in Figs. 5 and 6. There several layers 60 of covering material, such as plywood, are disposed on the inner surfaces of the panel fillers within the shell 25. Layers 61 of similar material are disposed on the inner surface of the inner layer 60 and are flush with the horizontal edges of the shell 25 but cover the inner ends of those edges. An inner covering 62, which may be made of material such as covering 53 or of steel is disposed against the inner surface of layers 61 and extends between the vertical and horizontal edges of those layers. A trim strip 63, which may be composed of stainless steel, plastic or the like, extends into the space between opposed coverings 61 and 62. These strips 63 abut against the opposed surfaces of adjacent columns, as is shown in Fig. 6.

It will be understood from the drawings and the foregoing description thereof that the columns 1 and 3 are inexpensive for they are composed of metal which may be rolled and bent and assembled at low cost and on a production basis. These columns are quite substantial because of their structural construction and may be made attractive by painting and in other obvious manners.

The panels are strong, substantial, serviceable over long periods of time and inexpensive. The shells 25 may be formed from sheet metal on a production basis and the fillers may be readily applied thereto. The filler may be made of poor heat conducting material which acts as an insulator to prevent the transfer of heat there-thru. The sealing means about the edges of the panels are effective in preventing the flow of fluids and heat there-thru. Thus, the wall is not only substantial and durable but is economical of fuel for heating purposes.

The outer surface of the panels may be formed so as to give the building a variety of different appearances. For example, as is shown in Fig. 5, the outer surface of shell 25 need not lie in a single plane but may be formed with undulations 65 which in this case extend horizontally. It will be understood that a variety of surface configurations may thus be imparted to the panels.

Furthermore, the outer surface of the shells 25 may be painted or coated with any of the well known finishes and thereby almost any desired color and combination of colors may be obtained. If desired, the outer surfaces of the panels may be enameled.

A wide variety of interior finishes may also be had by a suitable selection of coverings for the inner surfaces of the panels and trim strips may be used with these various coverings or omitted where and when desired.

Having thus described our invention so that others skilled in the art may be able to understand and practice the same, we state that what we desire to secure by Letters Patent is defined in what is claimed.

What is claimed is:

1. Building wall construction comprising a plurality of spaced, vertical, side wall and corner structural columns, each of said side wall columns having recessed outer sides, each of said corner columns including an inner rectangular column extending into the inner corner of an outer rectangular column and forming therewith recesses on the outer sides of said inner columns, a plurality of horizontal panels extending between adjacent columns and bearing against their outer sides, and clips secured in the recesses of said columns and operatively engaging said panels to retain them against the columns.

2. Building wall construction comprising a plurality of spaced, vertical, side wall and corner structural columns, each of said side wall columns having recessed outer sides, each of said corner columns including an inner rectangular column extending into the open inner corner of an outer rectangular column and forming recesses on the outer sides of said inner column, flanges at the open corner of the outer column bearing against and secured to the adjacent sides of the inner column, a plurality of horizontal panels extending between adjacent columns and bearing against their outer sides, and clips secured in the recesses of said columns and operatively engaging said panels to retain them against the columns.

3. Building wall construction comprising spaced, vertical, structural columns having recessed outer sides, horizontal panels spanning the space between two adjacent columns and arranged vertically one above another against the outer sides of said columns, said panels having interfitting horizontal edges, panel-retaining U-shaped sheet metal clips secured in the recesses in the columns for holding the panels against the recessed outer sides of the columns, said clips each having a leg bearing against a column, a leg spaced from the column, and a portion extending from the latter leg outwardly into the space between the interfitting edges and engaging and gripping said edges, and means extending through both said legs for exerting force on the outer leg tending to move it and said panels toward the columns.

4. Building wall construction comprising spaced, vertical, structural columns having recessed outer sides, horizontal panels spanning the space between two adjacent columns and arranged vertically one above another against the outer sides of said columns, said panels having interfitting horizontal edges of generally V-shape cross-section, and panel-retaining sheet metal clips for securing the panels against the recessed outer sides of the columns, each clip comprising

a U-shaped portion having an inner leg bearing against a column and an outer leg integral therewith and spaced from the column, and a V-shaped portion attached to the outer leg and engaging said interfitting edges of said panels, and means engaging the outer leg of each clip urging said leg and adjacent panels toward the inner leg and the column to which it is attached.

5. Building wall construction comprising spaced, vertical, structural columns, said columns each comprising an upright, elongated, metal, box-section member having an opening in one side extending substantially the full length of said member, and an upright, elongated, metal channel nested in said member and secured along its sides to opposing inner wall portions of the said member on opposite sides of said opening, horizontally extending panels spanning the space between two adjacent columns and arranged one above another against the open sides of said box-section members, and panel-retaining sheet metal clips secured in the columns to said channels and extending through said opening into the space between the horizontal edges of two adjacent panels for securing the panels against the opposed sides of the columns, each of said clips consisting of a first leg secured to a channel of a column, a second leg integral with and approximately parallel to said first leg and a portion integral with said second leg and projecting into the space between the horizontal edges of two adjacent panels, and means engaging and urging said second leg toward said column.

6. Building wall construction comprising spaced, vertical, structural columns, horizontal panels spanning the space between two adjacent columns and arranged vertically one above another against the outer sides of said columns, and panel-retaining sheet metal spring clips secured to the columns and extending into and weather-tightly closing spaces between adjacent panels each of said clips including a resilient portion consisting of two integral, approximately parallel legs, one of which is connected to a column and another resilient portion integral with the other leg and extending into the space between said panels, and means engaging and urging said other leg toward said column.

IRVING P. WHITEHOUSE.
WOLFGANG W. KRAUSS.
AUSTIN G. DAMON.

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
739,650	Clutter	Sept. 22, 1903
1,009,987	Murray	Nov. 28, 1911
1,709,988	Lampert	Apr. 23, 1929
1,863,231	Thune	June 14, 1932
2,056,359	Marty	Oct. 6, 1936
2,066,814	Williams	Jan. 5, 1937
2,114,155	Streich	Apr. 12, 1938
2,128,497	Olsen	Aug. 30, 1938
2,158,732	Shannon	May 16, 1939
2,175,271	Lethly	Oct. 10, 1939
2,209,283	Ronzzone	July 23, 1940
2,251,014	Firshing	July 29, 1941
2,266,599	Hasenburger et al.	Dec. 16, 1941
2,317,428	Anderson	Apr. 27, 1943
2,328,977	Hasenburger et al.	Sept. 7, 1943