Aug. 12, 1958 J. J. GRUBER 2,847,099

METAL WALL PANELS

Filed Jan. 16, 1956

2 Sheets-Sheet 1

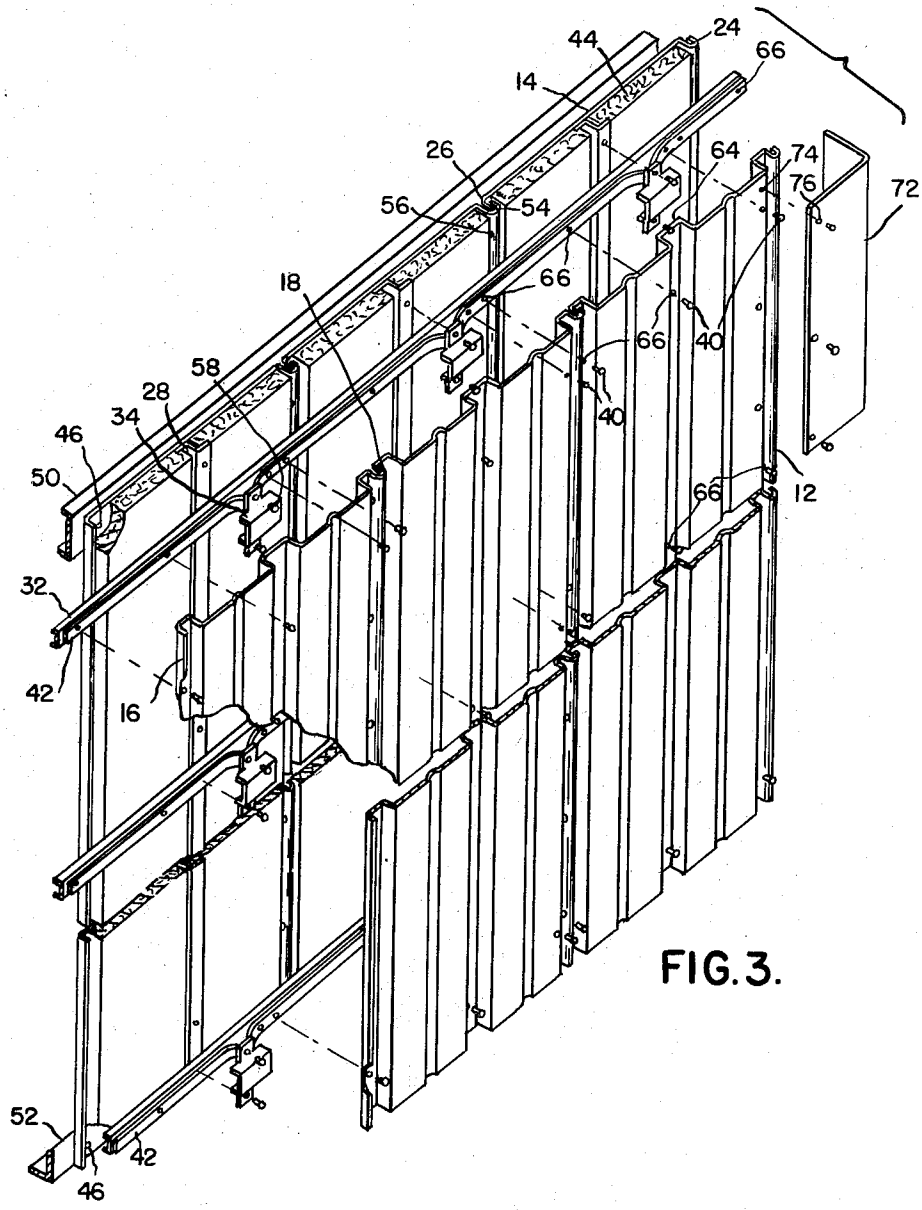

FIG. 3.

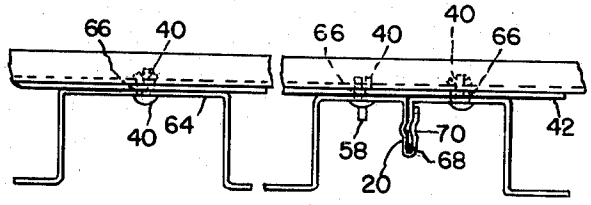

FIG. 6.

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FIG.1.

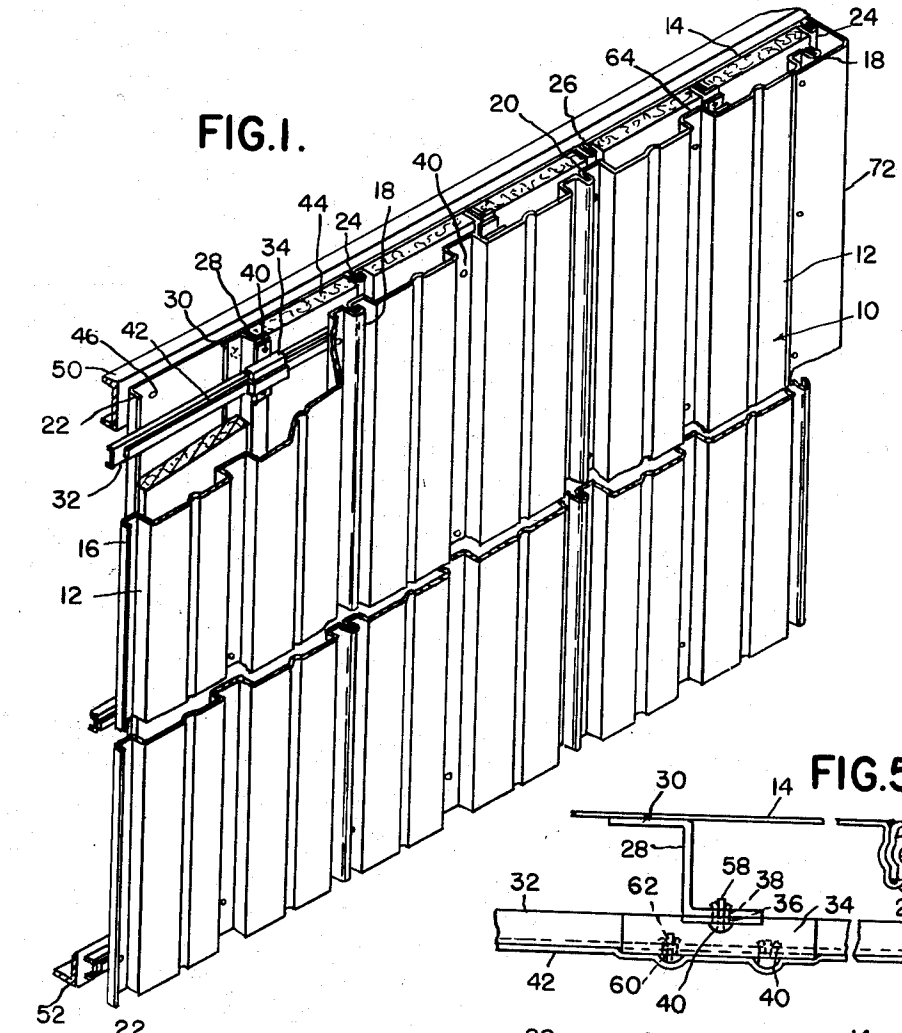

FIG.5.

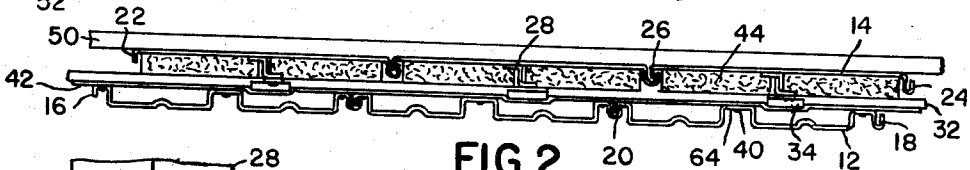

FIG.2.

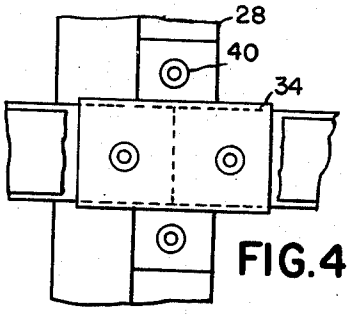

FIG.4.

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METAL WALL PANELS

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Application January 16, 1956, Serial No. 559,330

4 Claims. (Cl. 189—34)

The present invention relates to metal wall panels particularly adapted to form the exterior curtain walls of building constructions.

It is an object of the present invention to provide a metal wall panel comprising component parts manufactured in the shop and assembled on the job in the field.

It is further object of the present invention to provide a metal wall panel that can be easily erected and assembled in the field with only the use of hand tools.

Other objects and features of the invention will become apparent as the description proceeds, especially when taken in conjunction with the accompanying drawings, wherein:

Figure 1 is a perspective view of a portion of the assembled panel partly broken away.

Figure 2 is a top view of a portion of the assembled panel shown in Figure 1.

Figure 3 is an exploded view, partly broken away, of a portion of the panel showing the component parts and how they fit together.

Figure 4 is an enlarged view of a saddle clip.

Figure 5 is a top view of the saddle clip shown in Figure 4.

Figure 6 is an enlarged view of a portion of the panel attachment to a channel-shaped member.

Referring now to the drawings, there is illustrated generally at **10** a panel assembly having fluted plates **12** usually exposed to the weather side of the building construction, and flat plates **14** usually facing the interior of the building construction. The fluted plates have a male lap **16** along one terminal edge and a groove **18** along the opposite terminal edge to form a lap joint **20** when the plates are assembled in side by side relationship. The flat plates have the male lap **22** and a groove **24** along opposite terminal edges to form the lap joint **26**.

Z-shaped members or support bars **28** are attached to the flat plates **14** by spot welds **30** spaced along the length of the members. Channel-shaped members or girts **32** are held in position against the members **28** by saddle clips **34**. The girt members each comprise a web and edge flanges forming legs thereon. Apertures **36** which preferably are prepunched, in clips **34** are in alignment with apertures **38** in members **28** to receive the drive rivets **40** that hold the pieces assembled. Apertures **38** are intended to be drilled in the field to be in alignment with the prepunched apertures **36**.

Girt members **32** are of a length to span a plurality of flat plates **14** and are placed adjacent the top and bottom of the wall assembly and spaced intermediate the top and bottom appropriate distances to provide rigidity to the assembly.

Fluted plates **12** are attached to the members **32** by drive rivets **40**. A strip **42** of insulating material serves to prevent through metal conductivity of heat from one side to the other of the wall assembly. Batts **44** of insulating material such as glass fibre serve to provide heat insulating qualities to the finished wall.

The prefabricated members of the wall assembly are

shipped disassembled to the construction site where they are to be assembled to form a building wall. To secure the wall to the building, structural members such as the channel **50** and angle **52** are provided as part of the building structure.

A first plate member **14** is erected in the proper position with its top attached to channel **50** and its bottom to angle **52** by bolts or drive rivets **46**, or if desirable by welding. A sealing compound **54** is placed in the bottom of the groove **24** of the second plate member **14** and it is erected alongside of the first plate with the groove **24** fitting over the lap **22** to form a weathertight joint **26** when the lap becomes imbedded in the sealing compound. To additionally make the joint secure a hand tool is used to crimp the metal as at **56**, Figure 5, at spots spaced along the length of the joint. The second plate is also secured to structural members **50** and **52** by bolting or welding. Additional plates are erected side by side in the same manner for the length of the wall.

After the flat plates have been erected the batts **44** are placed in position between the members **28** and the joints **26**. The channel-shaped members **32** are then placed against members **28** and held secure with saddle clips **34** by drilling apertures **38** in alignment with the apertures **36**, placing the drive rivets **40** through aligned apertures **36** and **38**, and driving the pin **58** inward until its end is flush with the top of the rivet head, spreading the opposite end of the rivet body.

When members **32** are not of a sufficient length to span the length of the wall a second member **32** is placed end to end with the first member with their abutting ends being positioned under a clip **34**, as best seen in Figures 4 and 5. With the clip in place over the abutting ends of the channel-shaped members, apertures **60** and **62** are drilled through the clip and each of the abutting ends of the members **32**, respectively. Drive rivets are secured in the apertures in the same manner as previously described.

The insulating strip **42** is applied over the girt member **32**, by means of a suitable adhesive, or a strip may be used having a pressure sensitive adhesive on one side that will adhere to the member.

Fluted plates **12** are erected against the insulating strip **42** and are positioned laterally with respect to the plates **14** so that the web portions **64** come alongside of the clips **34**, as best seen in Figure 2. With the first plate **12** in correct horizontal and vertical position, apertures **66** are drilled through the plate **12**, strip **42** and girt channel **32**. Drive rivets are placed through apertures **66** and driven secure.

Sealing compound **68** is placed in groove **18** of a second plate **12** and the plate erected alongside of the first plate with the groove fitting over the lap joint **16** of the first plate to form a weathertight joint **20** when the lap becomes embedded in the sealing compound. Apertures **66** are drilled in the second plate and drive rivets are used to secure the plates. With the use of the hand tool crimps **70**, best seen in Figure 6, may if desired be spaced along the joint **20**. Additional plates **12** are erected in the same manner to complete the wall assembly.

At the ends of the wall or where openings occur plates **72** close the openings. They are erected in place by drilling apertures **74** in plates **12**, and **76** in plate **72** preferably simultaneously with plates **72** in erected position, and placing drive rivets through the apertures.

If desirable, the construction can be dismounted by removing rivets and/or bolts. Rivets may be removed by driving pins **58** on through the rivet, which may then be pulled out.

It can be readily understood from the foregoing description that the components of the wall can be prefabri-

cated in the shop, shipped to a building site and assembled on the job into a finished wall with only the use of hand tools.

The improved prefabricated field applied wall panel is described in such clear, concise and exact terms as to enable any person skilled in the art to practice the invention, the scope of which is indicated by the appended claims.

What I claim as my invention is:

1. In a wall construction, a plurality of edge-lapped panels, a flanged support bar carried by each panel intermediate its edges, the flange of said bar being parallel to and spaced from the plane of said panel, a girt member of U-shaped cross-section having a length to span a plurality of panels, the free edges of the legs of said U-shaped girt member engaging the flanges of said flanged bars, the webs of said U-shaped girt members being spaced from the plane of said flanges, clips securing said girt members to said flanges, said clips comprising a U-shaped portion overlying said girt members and apertured assembly flanges engaging the flanges of said support bars, and rivets connecting said assembly flanges to the flanges of said support bars.

2. In a wall construction, a plurality of edge-lapped panels, a flanged support bar carried by each panel intermediate its edges, the flange of said bar being parallel to and spaced from the plane of said panel, a girt member of U-shaped cross-section having a length to span a plurality of panels, the free edges of the legs of said U-shaped girt member engaging the flanges of said flanged bars, the webs of said U-shaped girt members being spaced from the plane of said flanges, clips securing said girt members to said flanges, said clips comprising a U-shaped portion overlying said girt members and apertured assembly flanges engaging the flanges of said support bars, blind rivets connecting said assembly flanges to the flanges of said support bars, additional panels, means connecting the additional panels to the girt members, and thermal insulating strips covering said girt members and interposed between said girt members and said additional panels and insulating said additional panels from said girt members.

3. A wall construction comprising a plurality of edge-lapped panels, a flanged support bar carried by each panel

intermediate its edges, the flange of said bar being parallel to and spaced from the plane of said panel, a girt member of U-shaped cross-section having a length to span a plurality of panels, the free edges of the legs of said U-shaped girt member engaging the flanges of said flanged bars, the webs of said U-shaped girt members being spaced from the plane of said flanges, clips securing said girt members to said flanges, said clips comprising a U-shaped portion overlying said girt members and apertured assembly flanges engaging the flanges of said support bars, rivets connecting said assembly flanges to the flanges of said support bars, and fluted panels secured to said girt members with inwardly concave fluted portions spanning said clips, and inwardly convex portions directly adjacent said clips connected to the webs of said girt members, said inwardly convex portions and the webs of said girt members having aligned apertures, and blind rivets expanded in the apertures.

4. Metal wall structure adapted for field assembly comprising first coplanar edge-lapped panels for initial connection to a frame, a support bar permanently secured to each of said first panels located intermediate and extending substantially parallel to the lapped edges thereof, said bars having flanges parallel to and spaced outwardly from the plane of said first panels, elongated girt members spanning a plurality of said first panels and extending substantially perpendicular to said bars, saddle clips spanning said girt members and having flanges engaging the flanges of said support bars, means securing the flanges of said saddle clips to the flanges of said support bars, second coplanar edge-lapped panels, means connecting said second panels to said girt members, and a thermal insulating strip covering said girt members and interposed between said girt members and said second panels and insulating said second panels from said girt members.

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