Nov. 24, 1936. J. MULLER 2,061,633

WALL SECTION AND WALL ASSEMBLY

Filed Nov. 20, 1933 2 Sheets-Sheet 1

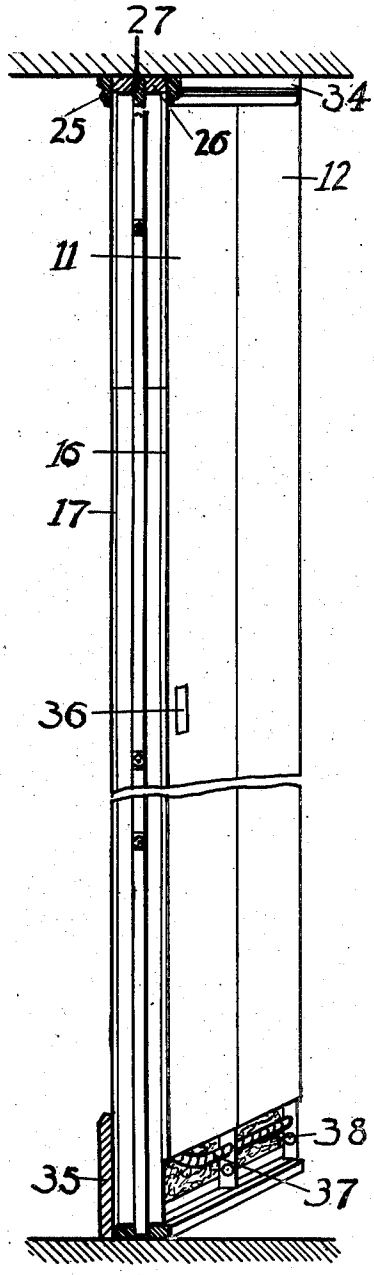



FIG. 1

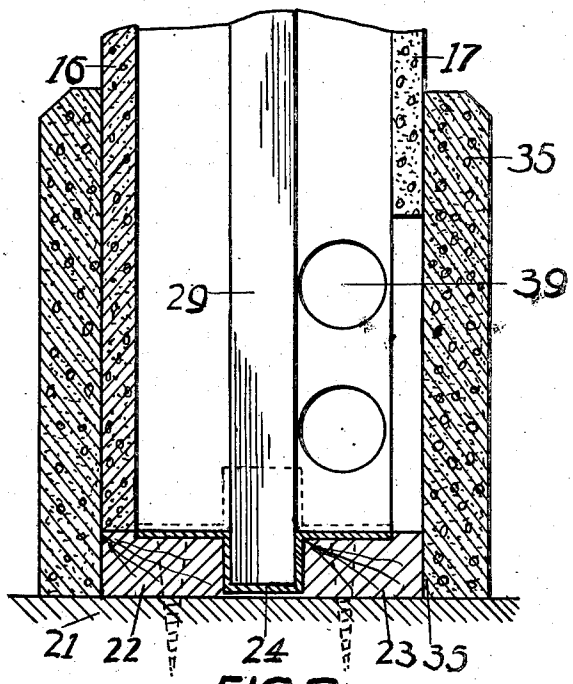



FIG. 2

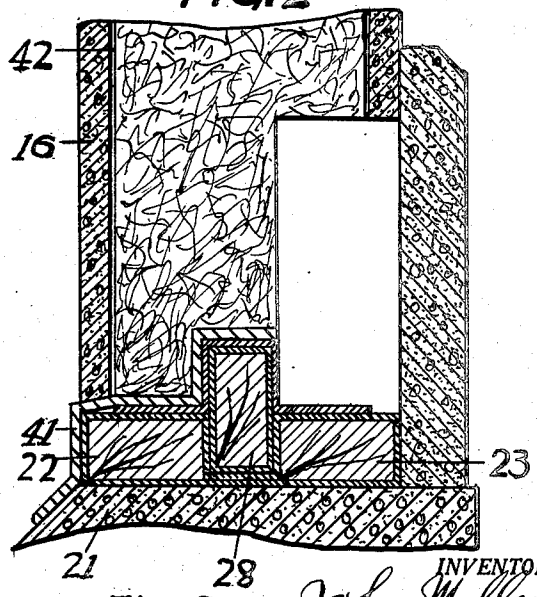



FIG. 3

INVENTOR.
BY John Muller
Theodore Simmons
ATTORNEYS.

Nov. 24, 1936. J. MULLER 2,061,633

WALL SECTION AND WALL ASSEMBLY

Filed Nov. 20, 1933 2 Sheets-Sheet 2

FIG. 4

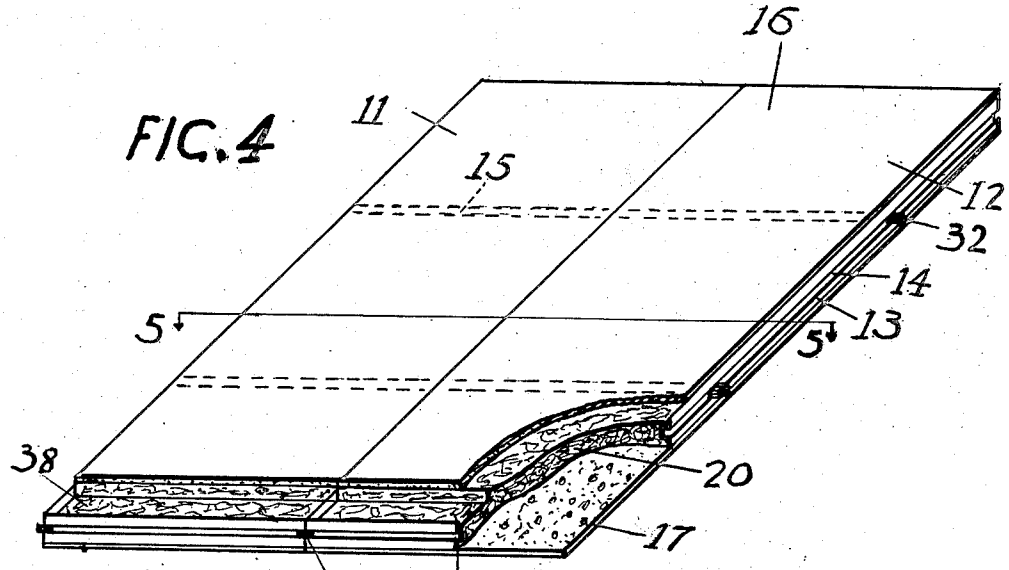



FIG. 5

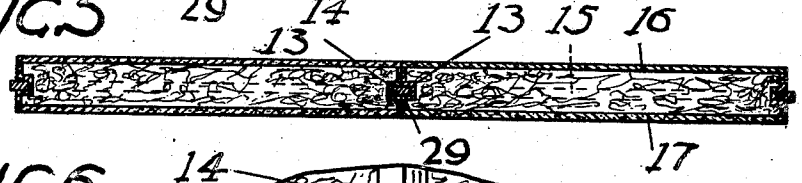
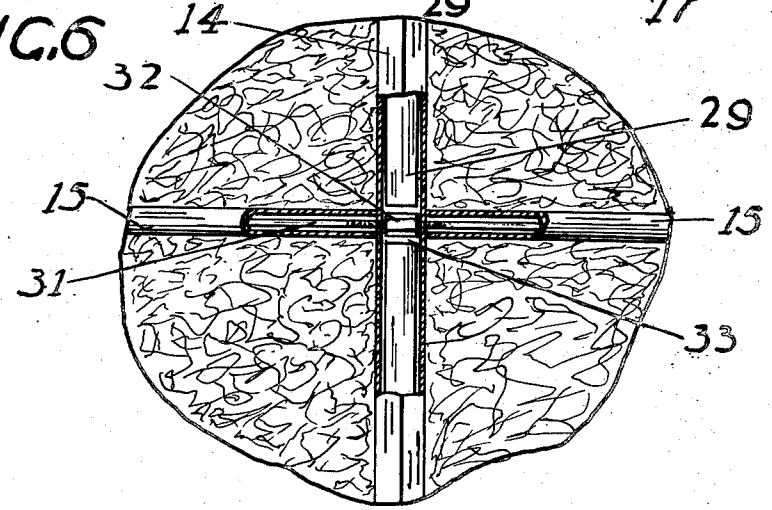



FIG. 6




INVENTOR.
John Muller
BY M. Hudson Simmons
ATTORNEYS.

Patented Nov. 24, 1936 2,061,633

# UNITED STATES PATENT OFFICE

2,061,633

## WALL SECTION AND WALL ASSEMBLY

John Muller, Brooklyn, N. Y.

Application November 20, 1933, Serial No. 698,780

13 Claims. (Cl. 72—16)

My invention relates to a new and improved method of erecting walls of building structures, interoffice partitions, etc.

In carrying out the improved method it has also been a part of my invention to devise a new and improved wall section.

In carrying out my invention I assemble a wall of a plurality of sections, each section complete in itself, of desired thickness, insulating qualities, height and surface finish. Each section is structurally rigid and is provided with a metallic frame. When the sections are assembled side by side the contiguous metallic frames are locked together by means which extend above and below the frames into the upper and lower supporting members. The upper and lower supporting members are otherwise locked to the sections at the top and bottom, the sections being slid between the upper and lower supporting members as they are assembled in place.

In addition I may provide a novel method of locking the wall sections together by imbedding in each wall section tubular members through which pass extension bolts. Between each pair of sections the extension bolts are provided with clamping nuts which engage the metal frames of the sections as the sections are drawn up in place.

Another phase of my invention consists in a new and improved insulating wall section wherein there is used an improved heat and sound insulation.

The objects and advantages of my invention will be best understood from a consideration of the following specification taken in conjunction with the accompanying drawings, wherein—

Figure 1 is a perspective view of a portion of the wall assembly of my improved wall sections and by my improved method of assembly;

Fig. 2 is an enlarged end view, partly in section, of one of my wall sections showing the assembly at the bottom;

Fig. 3 is an enlarged vertical section of one of my improved wall sections illustrating the construction when the same is to be used as an outside wall;

Fig. 4 is a perspective view of two of the assembly wall sections not mounted in place in the wall;

Fig. 5 is a cross section on the line 5—5 of Fig. 4, and

Fig. 6 is an enlarged view showing in detail the arrangement and assembly using the transverse extension bolts.

Referring to the drawings, 11 and 12 represent individual wall sections. Each wall section is provided with a surrounding metal frame 13 which is channeled on all sides as indicated at 14. In each section is mounted one or more tubes 15, the tubes being mounted between the channel offsets 14 and terminating in the channels 14. These tubes may be welded or otherwise secured in place, if they are used at all.

The frame 13 is of the depth desired for the wall section and I propose to make the wall formed of my improved wall sections sound and temperature proof by filling the frame with an insulation material which has a certain rigidity and which imbeds the channel offsets 14 and the tubular members 15. The layer of insulation is indicated at 20.

For this purpose I provide a new and improved composition insulation which consists in mixing excelsior or similar shavings or chips with a cement-like mortar composed of eighty parts of magnesium oxide, eighty parts of magnesium chloride, and an equal quantity of water, to which approximately thirty parts of powdered asbestos is added. The asbestos powder is added in a quantity to produce the proper consistency.

The excelsior mixed with this mortar is poured into the frame and spread out so as to fill the frame but not extend beyond the edges of the frame. The insulation mixture is then allowed to dry and stay, in which condition it becomes a hard mass filled with innumerable pores and air spaces.

My insulation has a further unique characteristic in that it is moisture-proof. I have found that even immersing the wall section in water will not injure the quality of the insulation and that the insulation will absorb only eleven percent of water. Accordingly, my wall sections are also moisture-proof.

The wall section may be completed by surfacing one or both sides of the framed section as indicated at 16 and 17. For this purpose I may use a mortar or plaster or cement, as it may be termed, composed of the same mixture with which the excelsior is coated except that when used for the outer surface coverings 16 and 17 the consistency will be heavier and will be made so by adding additional powdered asbestos. The surface coverings for the wall sections rest upon the insulation filling and overlie the edges of the frame so that when the wall sections are assembled together a continuous surface is provided as indicated in Figs. 1, 4 and 5.

When a wall is to be erected, top and bottom supporting members are erected in place as indi-

cated in Figs. 1, 2 and 3. There is secured to the foundation 21 a pair of runners 22, 23, which are spaced apart so as to leave a channel therebetween. These runners extend longitudinally of the wall. Over the runners there may be added, if desired, a metallic sheath 24 which is shaped so as to cover the channel between the runners 22 and 23 as clearly shown in Fig. 2. This channel between the runners 22 and 23 corresponds to the channels in the top and bottom of the frames of the respective sections and registers therewith when the sections are assembled in place between the top and bottom runners. A pair of runners 25 and 26 may be arranged at the top as indicated in Fig. 1 and they are constructed and covered in the same manner as described for the bottom of the wall.

With the runners in place, a wall section 12, for example, is slid into position between the top and bottom runners with the top and bottom grooves of its frame registering with the top and bottom grooves of the supporting members. Then a tongue such as indicated at 27 in Fig. 1 is slid into the registering channels between the members 25 and 26 and the channel of the top of the frame 12 and a similar runner indicated at 28 in Fig. 3 is slid into the registering channels at the bottom, thus locking the frame section 12 in place.

Then before the next section is mounted in place a vertical tongue 29 is placed in the exposed channel of the side frame of the section 12. The tongue 29 is long enough to extend into the channels made by the upper and lower runners. Then the next section, for example section 11, of Fig. 1 is slid into place between the upper and lower runners with the channel of its side frame completing the enclosing of the tongue 29. This is shown to good advantage in Fig. 5. Thus, with the steel frames 13 in close juxtaposition and the tongue 29 locking the frames together and extending into the upper and lower supporting members, the wall is given a strong vertical strut at the intersection of each section of the wall. Additional runners 27 and 28 are fitted in place and this is continued until the entire wall is assembled.

I have provided a further method of locking the wall sections together and of bracing the same which consists of passing through the tubes 15 extension bolts 31 (Fig. 6). Thus, before section 11 would be put in place in the above described assembly, the clamping nut 32 of each extension bolt would be screwed home, in which position the nut 32 engages the bottom of the channel 14. The vertical tongue 29 is provided with a plurality of transverse holes one of which is indicated at 33 to allow for the clamping nuts 32.

Then when the wall section 11 is slid into place, its tubes 15 are aligned with the tubes 15 of the wall section 12 and another set of extension bolts are passed through the tubes 15 of the section 11 and screwed into the opposite end of the clamping nuts 32 so that when the section 11 is in place the other side of the clamping nuts 32 will engage the bottom of the channel 14 of the section 11. I have found that this construction gives considerable additional rigidity to the wall, and after the last section is in place the whole section becomes firmly bolted together by the addition of a nut on the outer end of the exposed bolt. The finishing off of the exposed end of the wall, in the case of an office partition for example, is a simple matter, and the finishing off of the inner end of the wall is accomplished by the insertion of some filler strips not shown but well known which are then covered over with the same substance as in the surface 16, 17.

After the wall is assembled in place, finishing moldings such as shown at 34, and base boards such as shown at 35, may be put in position.

In Fig. 1 I have shown molded in place in the insulation a switch outlet box 36 and electric cable 37, which is led down to the bottom of the wall section as shown in Fig. 1.

This bottom section is purposely not finished off with insulation material or plaster surfacing, as shown for example in Figs. 1 and 4, thus leaving at the bottom of each wall section a pocket 38 for the passage of electric wires, telephone wires, etc., therethrough, below the level of the base board. For this purpose also, the sides of the frame are apertured as indicated at 39.

In Fig. 3 is shown a modified arrangement to be used when my wall section is used at the outer wall. In this case there is inserted into the base of the frame a lead or other malleable metal strip 41 which extends out beyond the edges of the frame and the width of the surface covering 16. After the wall section is in place, the strip 41 is bent down over the sides of the supporting runners 22 and along the foundation 21 to prevent the creeping in and the beating in of rain and water. Where my wall section is exposed to the weather, I find it advantageous to apply a coat of moisture-proof paint such as asphalt paint, as indicated at 42.

It may be seen from the foregoing that I have not only provided a new and improved wall section, but also a new and improved method of assembling walls so as to present rigid permanent structures.

Modifications may be made in the arrangement and location of parts within the spirit and scope of my invention, and such modifications are intended to be covered by the appended claims.

I claim:

1. A completely finished wall section ready for assembly comprising a surrounding channeled metallic frame, the channeled portion extending inwardly, said frame being filled with a loosely packed hardenable insulation material that is mixed with a cementitious binder, the inwardly extending channeled portion being imbedded in the hardened filler to support the same in the frame, the hardened filler being not reinforced, and a finishing plastered covering for one or both of the outer surfaces of said wall section applied upon the hardened filler and extending outside said frame.

2. A completely finished wall section ready for assembly comprising a surrounding channeled metallic frame, the channeled portion extending inwardly, a plurality of tubes extending transversely of said frame between opposite channeled portions and being secured therein, said frame being filled with a loosely packed hardenable insulation material that is mixed with a cementitious binder, said hardenable filling material surrounding and imbedding the channeled portions and the tubes, and a finishing plastered covering for one or both of the outer surfaces of said wall section applied upon the hardened filler and extending outside said frame.

3. A wall formed of a plurality of readily assembled and disassembled completely finished sections, each section extending the full height

of the wall and comprising a surrounding metallic frame filled with insulating material, the face of each section being covered with a cementitious covering which extends outwardly and overlies the edges of the frame to form a smooth outer finishing surface, the completed sections being assembled together so that the contiguous metallic frames constitute vertical bracing struts for the wall, the assembled wall sections being laterally supported at the top and bottom thereof by means engaging the metallic frame.

4. A wall formed of a plurality of readily assembled and disassembled completely finished sections supported between laterally extending members at the top and bottom of the wall, each section comprising a surrounding channeled metallic frame and insulating material combined with a mortar and filling the frame so as to imbed the channel offset of the frame, and separate locking means engaging in the channels of said frames and extending beyond the same and between the lateral supporting members.

5. A wall formed of a plurality of assembled sections supported between longitudinally extending members at the top and bottom of the wall, each section comprising a surrounding channeled metallic frame and insulating material combined with a mortar and filling the frame so as to imbed the channel offset of the frame, the sections being assembled side by side with adjacent channels of each section registering, and a tongue extending the full length of the registering channels and engaging the same, said tongue extending above and below the frames and in between the upper and lower longitudinal supporting members.

6. A wall formed of a plurality of assembled sections, each section comprising a surrounding metallic frame having inwardly offset hollow portions on each side of the frame, tubular members mounted between the offset portions, and a filling of insulating material imbedding the offset portions and the tubular members, the sections being assembled with the hollow offset portions and the tubular members aligned, and a series of extension bolts, one or more for each section, mounted in the tubular members, the clamping nuts of the bolts being located in the aligned hollow members.

7. A wall formed of a plurality of assembled sections, each section comprising a surrounding channeled metallic frame, tubular members mounted between the channel offsets of the frame, and a filling of insulating material imbedding the channel offsets and the tubular members, the sections being assembled with the contiguous channels and the tubular members aligned, and a series of extension bolts, one or more for each section, extending through the tubular members and terminating in the channels, the clamping nuts of the bolts being located in the channels and engaging the bottoms of the contiguous channels when the sections are in place in the wall.

8. A wall formed of a plurality of assembled sections supported between members extending longitudinally at the top and bottom of the wall, each section comprising a surrounding channeled metallic frame, tubular members mounted between the channel offsets of the frame and a filling of insulating material imbedding the channel offsets and the tubular members, the sections being assembled with the contiguous channels and the tubular members aligned, a series of extension bolts, one or more for each section, extending through the tubular members and terminating in the channels, the clamping nuts of the bolts being located in the channels when the sections are in place in the wall, and a tongue extending the full length of each pair of contiguous channels and engaging the same, the tongue having transverse holes for the passage of the clamping nuts and bolts, said tongues extending above and below the frames and in between the upper and lower longitudinal supporting members.

9. A wall formed of a plurality of assembled sections, each section comprising a surrounding channeled metallic frame and a filling of insulating material imbedding the channel offsets, the sections being assembled with the channels on the sides of the frames registering and with the channels at the tops and bottoms of the frames aligned, channeled upper and lower supporting members, the channels thereof registering respectively with the channels at the top and bottom of the frames, a tongue engaging the registering side channels and extending vertically above and below the frames into the channels of the upper and lower supporting members, and a plurality of tongues extending between the projecting vertical tongues and respectively engaging the registering channels of the upper supporting member and top of the frame and the bottom supporting member and bottom of the frame.

10. A wall formed of a plurality of assembled sections, each section comprising a surrounding channeled metallic frame, insulating material combined with a mortar and filling the frame so as to imbed the channel offsets of the frame, and a smooth face for each wall section formed of said mortar and overlying the edges of the frame and the filling of insulating material, the sections being assembled with the channels on the sides of the frames registering and with the channels at the tops and bottoms of the frames aligned, channeled upper and lower supporting members, the channels thereof registering respectively with the channels at the top and bottom of the frames, a tongue engaging the registering side channels and extending vertically above and below the frames into the channels of the upper and lower supporting members, and a plurality of tongues extending between the projecting vertical tongues and respectively engaging the registering channels of the upper supporting member and top of the frame and the bottom supporting member and bottom of the frame.

11. A wall formed of a plurality of assembled sections, each section comprising a surrounding channeled metallic frame, tubular members mounted between the channel offsets of the frame and insulating material combined with a mortar and filling the frame so as to imbed the channel offsets of the frame and the tubular members, and a smooth face for each wall section formed of said mortar and overlying the edges of the frame and the filling of insulating material, the sections being assembled with the channels on the sides of the frames registering and with the channels at the tops and bottoms of the frames and with the tubular members aligned, channeled upper and lower supporting members, the channels thereof registering respectively with the channels at the top and bottom of the frames, a tongue engaging the reg-

istering side channels and extending vertically above and below the frames into the channels of the upper and lower supporting members, a plurality of tongues extending between the projecting vertical tongues and respectively engaging the registering channels of the upper supporting member and top of the frame and the bottom supporting member and bottom of the frame, and a series of extension bolts, one or more for each section, extending through the tubular members and terminating in the channels, the clamping nuts of the bolts being located in the channels and engaging the bottoms of the contiguous channels when the sections are assembled in place in the wall.

12. A wall section comprising a surrounding metallic frame filled with a loosely packed insulation material that is mixed with a binder, a malleable weather strip mounted in the frame and secured in place so as to extend out beyond the frame in position and of a length to be bent downwardly over the foundation upon which the wall section may be supported.

13. A wall formed of a plurality of assembled sections supported upon longitudinally extending channeled members at the bottom of the wall, each section comprising a surrounding channeled metallic frame and insulating material combined with the mortar and filling the frame so as to imbed the channel offset of the frame, each section also having secured in the frame at the bottom thereof a lead insert which extends out beyond the edge of the frame, the insert being bent downwardly so as to cover the supporting member and overlie the foundation for the wall.

JOHN MULLER.