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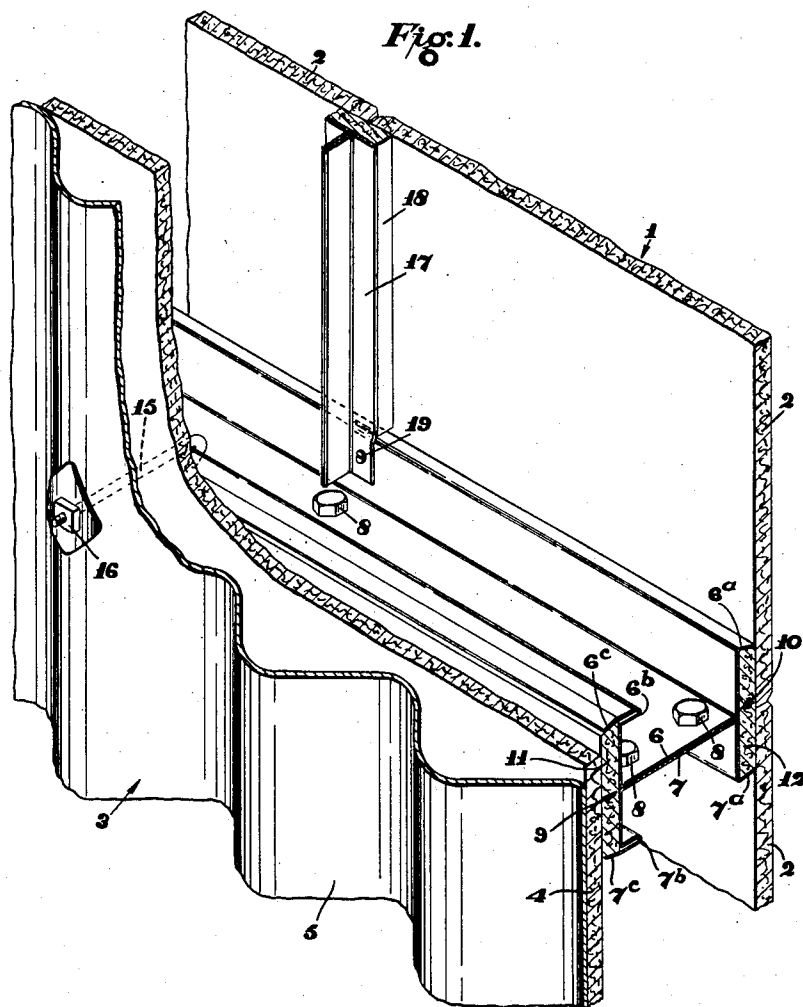
E. GRIFFIN ET AL

2,904,851

WALL STRUCTURES FOR BUILDINGS

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3 Sheets-Sheet 1



Inventors:
Eric Griffin
Barry Robert Flury
By Walter Becker
Patent Agents

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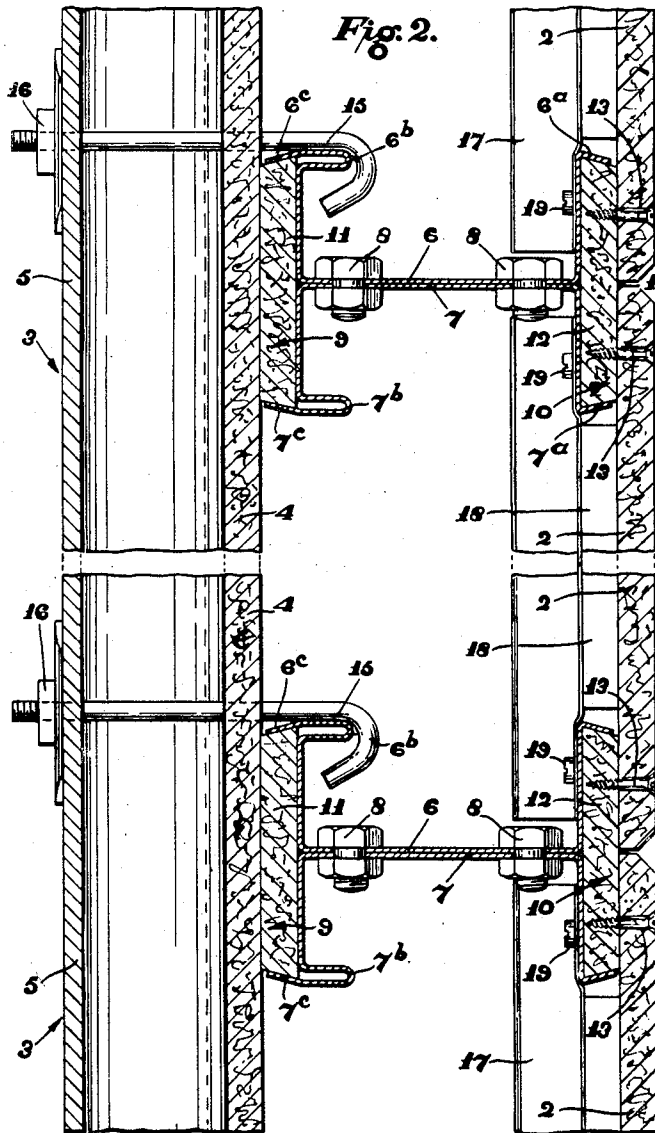
E. GRIFFIN ET AL

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Inventors,
Eric Griffin
Barry Robert Flury
By *William B. Bunker*
Patent Agents

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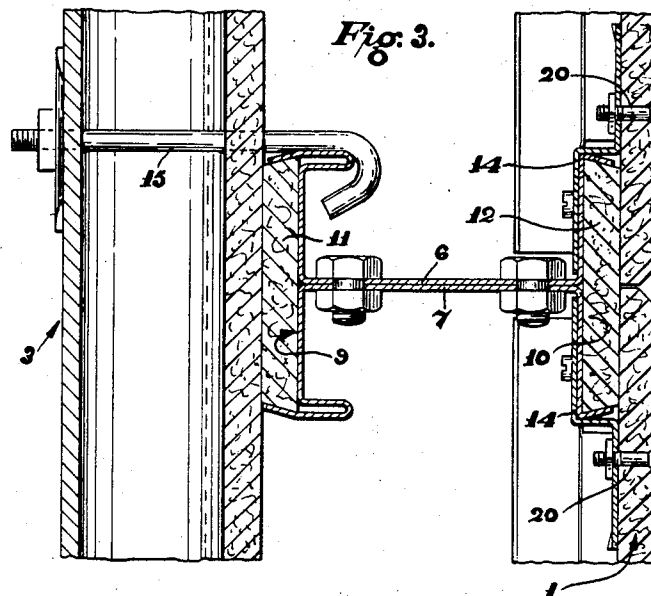
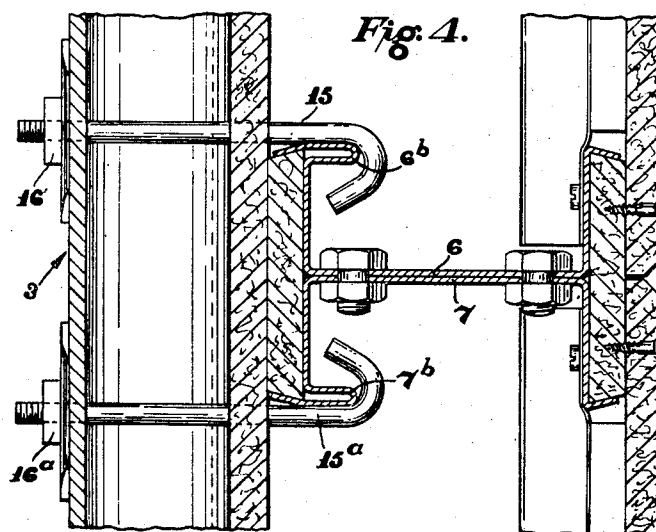
E. GRIFFIN ET AL

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Inventors:
Eric Griffin
Barry Robert Fury
By *William D. Berlin*
Patent Agent

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WALL STRUCTURES FOR BUILDINGS

Eric Griffin, Oldbury, near Birmingham, and Barry Robert Flury, Aston, Birmingham, England, assignors to Metal Sections Limited, Oldbury, near Birmingham, England, a British company

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4 Claims. (Cl. 20—4)

This invention relates to composite wall structures particularly for buildings, such structures being of a hollow construction comprising two spaced-apart walls, preferably of asbestos composition or other fire-proof material tied together by suitable means. Wall structures of this kind are used, for example, in the construction of houses and other buildings for reducing fire risks particularly where the buildings are situated closely together, so that in the event of a fire breaking out in one of the buildings it is confined within that building and is prevented from spreading to adjacent houses. The object of the invention is to provide a wall structure of the kind referred to of an improved and novel construction, which considerably reduces the cost of erection.

According to the invention, a wall structure comprises a pair of spaced-apart walls tied together at spaced intervals by pairs of channel members disposed between the walls and secured together back-to-back, two corresponding sides of the two channels being connected to the one wall and the other two corresponding sides of the channels, or one of the said sides being connected to the other wall. The sides of the channels may be formed with outwardly-directed parts or flanges to provide between them shallow auxiliary channels at right-angles to the main channels, the shallow channels carrying fillets of asbestos or other material intended to bear against the faces of the walls. The main channels may be secured to the walls by clips, bolts or other means engaging the sides of the said main channels.

Figure 1 of the accompanying drawings represents a perspective view of a double wall structure constructed in accordance with this invention, the structure being broken away and shown partly in section.

Figure 2 represents a vertical section through a portion of the improved wall structure.

Figure 3 shows a slight modified construction.

Figure 4 another modification.

Referring to Figures 1 and 2 of the drawings, the improved double wall structure comprises an inner wall 1 made up of asbestos composition slabs 2 and an outer wall 3 spaced laterally from the said inner wall 1 and made up of similar asbestos composition slabs 4 covered on the outside by a shell or casing 5 of corrugated sheet metal. The said inner and outer walls 1 and 3 are rigidly tied together by metal spacing devices secured to the two walls by bolts and clips, the said spacing devices or ties extending horizontally between the two walls, for the full length of the latter, if necessary, a number of spacing devices being arranged one above another, according to the height of the wall structure, and being separated vertically from one another. Each spacing device or tie is formed by two metal channels 6 and 7 reversed relatively to one another and disposed back-to-back, the two channels being formed with flat bases which are secured together in close contact by bolts 8, or by other means, so that the said channels are presented, as shown, in opposite directions, and when the spacing device or tie is in position the one channel 6 is presented upwards and

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the other channel 7 downwards. The sides of the two channels 6 and 7 are mainly at right-angles to their bases, with corresponding sides of the two channels, which are of equal width, in alignment, but whilst the outer edge of the one side of each channel is bent outwards to form a flange 6^a or 7^a disposed at an acute angle to the said side, the outer edge of the other side of each channel is first bent inwardly at right-angles to the said other side and is then folded over to form an inwardly-directed flange 6^b or 7^b composed of a double thickness of metal, the folded-over portion being directed horizontally outwards and bent at a slight angle to form a flange 6^c or 7^c.

Correspondingly bent sides of the two channels 6 and 7 are disposed at the same side of the complete two-channel structure, as shown, and the construction is such that there is provided at each side of the latter a shallow auxiliary channel 9 or 10 disposed in a plane at right-angles to the bases of the main channels, with the bent-in flanges 6^a, 7^a and 6^c, 7^c which forms the sides of the two auxiliary channels converging slightly towards one another. Each of these auxiliary channels 9 and 10 is fitted with a flat-faced fillet or insert 11 or 12 of asbestos composition, the fillet, which has bevelled longitudinal edges, being held within the respective auxiliary channel by the converging sides of the latter, with a flat face of the fillet projecting outwards slightly beyond the channel, as shown in Figure 2. When the composite metal spacing and tie device formed by the channels is placed between the two walls 1 and 3 of the building the flat faces of the asbestos fillets 11 and 12 engage the opposed faces of the composition slabs 2 and 4 of the two walls so that no metal parts of the device engage the latter. The fillets 11 and 12 may be positioned to cover the joints between the slabs 2 or 4 of the wall structure, when desired.

In order to secure each composite channel structure between the two walls 1 and 3 of the building screws 13 are inserted through the inner wall 1 and are screwed into the fillet or inset 12 within the adjacent auxiliary channel 10. The opposite side of the composite channel structure, on the other hand, is secured to the outer wall 3 of the building by a row of hook-ended bolts 15 fitted with nuts 16, the bolts passing not only through the slabs 4 of the said outer wall but also through the outer corrugated sheet metal or asbestos composition shell 5. Only a single row of hook bolts 15 need be provided for each double-channel tie, the bolts being spaced at suitable intervals apart and their hook ends being arranged to engage over the inwardly-directed flange 6^b of the upper main channel 6, as shown. If desired, however, similar hook bolts may engage a corresponding part 7^b of the lower channel 7, as well as, or instead of, the hook bolts engaging the flange of the upper main channel.

When the clips or clamping members 14 are secured and the nuts 16 on the hook bolts 15 are tightened the whole double wall structure is made perfectly rigid, the two walls 1 and 3 being tied together by the sets of metal channels 6 and 7. In addition to the clips 14 and hook bolts 15 vertical T-sectioned angle-iron 17, with facing fillets of asbestos composition 18, are applied against the face of the inner wall 1, so that the fillets 18 come between the latter and the angle-irons and, if desired, cover the vertical joints between the slabs or blocks 2 forming the wall, as shown in Figure 1. The ends of these vertical angle-irons 17 are arranged to seat themselves against, and are secured to, the sides of the main channels 6 and 7 of the spacing and tie devices and each vertical T-iron may be of a length to extend from the side of the upper channel 6 of the one spacing and tie device to the corresponding side of the lower channel 7 of an adjacent spacing and tie device. The vertical T-irons 17 are secured to the channels by bolts 19 and in conjunction with the spacing and tie devices serve to

provide a very rigid interior structure for supporting the two walls of the building.

The main channels 6 and 7 of each spacing and tie device are identical in form, so that they may be fitted together with either channel uppermost, and the device, with the asbestos fillets in place, may be completely assembled and transported as a unit to the wall structure ready for fitting into place between the two walls.

If desired, layers of heat insulating material may be interposed between the asbestos composition fillets 11, 12 and 18 and the walls. The vertical bars connecting one pair of back-to-back channels to an adjacent pair may be of any other suitable cross-sectional shape.

In the modification shown in Figure 3 of the drawings, the composite channel structure which ties together the walls 1 and 3 is the same as previously described, comprising two back-to-back main channels 6 and 7 and auxiliary side channels 9 and 10 each containing a fillet or inset 11 or 12 of asbestos composition, and whilst the one side of the composite channel structure is secured to the outer wall 3 by hooks 15, as before, the other side is secured to the wall 1 by upper and lower rows of stepped or Z-shaped clips or clamping members 14 each consisting of two arms joined by an intermediate part. One arm of each of the members 14 of the upper row engages closely against the inside face of the adjacent side of the upper main channel 6 and one arm of each of the clips or clamping members of the lower row engages closely against the inside face of the adjacent side of the lower inverted main channel 7. The other arms of the clips 14 of both rows engage flatly against the face of the inner wall 1 of the building, fixing bolts 20 passing through the said arms and through the said inner wall, as shown.

The constructions shown in Figure 4 of the drawings is the same as that illustrated in Figures 1 and 2, except for the fact that two rows of hook-ended bolts 15 and 15^a are provided for securing the one side of the composite channel structure to the wall 3. The upper row of hook bolts 15 engage over the inwardly-directed flange 6^b of the main channel 6, the bolts passing through the wall 3 and being each tightly clamped by a nut 16, and the lower row of hook bolts 15^a engaging over the inwardly-directed flange 7^b of the main channel 7, these bolts likewise passing through the wall 3, as shown, and being each secured by a nut 16^a.

We claim:

1. A wall structure comprising two spaced-apart walls, a pair of main channels secured together back-to-back and disposed between the two walls, the edges of two corresponding sides of the two main channels being bent into outwardly-directed flanges and the edges of the other two corresponding sides of the main channels being bent first inwards to form inwardly-directed flanges and then folded over and directed outwards to form outwardly-directed flanges, the outwardly-directed flanges providing between them auxiliary channels disposed one at each side of the main channels in planes at right-angles to the bases of the latter, insets within the auxiliary channels bearing against the inner faces of the respective walls, bolts passing through the one wall, the bolts having hook ends engaging the inwardly-extending flange of at least one of the main channels, to secure the latter to the said wall, and means for securing the two main channels to the other wall.

2. A wall structure comprising two spaced-apart walls, a plurality of vertically-spaced pairs of main channels

secured together back-to-back and disposed between the two walls, the edges of two corresponding sides of each pair of main channels being bent into outwardly-directed flanges and the edges of the other two corresponding sides of the said main channels being bent first inwards to form inwardly-directed flanges and then folded over and directed outwards to form outwardly-directed flanges, the outwardly-directed flanges providing between them auxiliary channels disposed one at each side of the afore-said main channels in planes at right-angles to the bases of the latter, insets within the auxiliary channels bearing against the inner faces of the respective walls, bolts passing through the one wall, the bolts having hook ends engaging the inwardly-extending flange of at least one of the main channels of each pair, to secure the channels to the said wall, means for securing the two main channels to the other wall, and uprights connecting one pair of spaced-apart main channels to an adjacent pair.

3. A wall structure comprising two spaced-apart walls, a pair of main channels secured together back-to-back and disposed between the two walls, the edges of two corresponding sides of the two main channels being bent into outwardly-directed flanges and the edges of the other two corresponding sides of the main channels being bent first inwards to form inwardly-directed flanges and then folded over and directed outwards to form outwardly-directed flanges, the outwardly-directed flanges providing between them auxiliary channels disposed one at each side of the main channels in planes at right-angles to the bases of the latter, insets within the auxiliary channels bearing against the inner faces of the respective walls, bolts passing through the one wall, the bolts having hook ends engaging the inwardly-extending flange of at least one of the main channels, to secure the latter to the said wall, and Z-shaped attachment members each having one arm secured to the other wall and the other arm bearing on an adjacent side of one of the main channels with the intermediate part of the attachment member extending across the outwardly-directed flange of the said side.

4. A wall structure comprising two spaced-apart walls, a pair of main channels secured together back-to-back and disposed between the two walls, the edges of two corresponding sides of the two main channels being bent into outwardly-directed flanges and the edges of the other two corresponding sides of the main channels being bent first inwards to form inwardly-directed flanges and then folded over and directed outwards to form outwardly-directed flanges, the outwardly-directed flanges providing between them auxiliary channels disposed one at each side of the main channels in planes at right-angles to the bases of the latter, insets within the auxiliary channels bearing against the inner faces of the respective walls, bolts passing through the one wall, the bolts having hook ends engaging the inwardly-extending flange of at least one of the main channels, to secure the latter to the said wall, and screws passing through the other wall screwing into the auxiliary channel inset which bears against the inner face of said wall.

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