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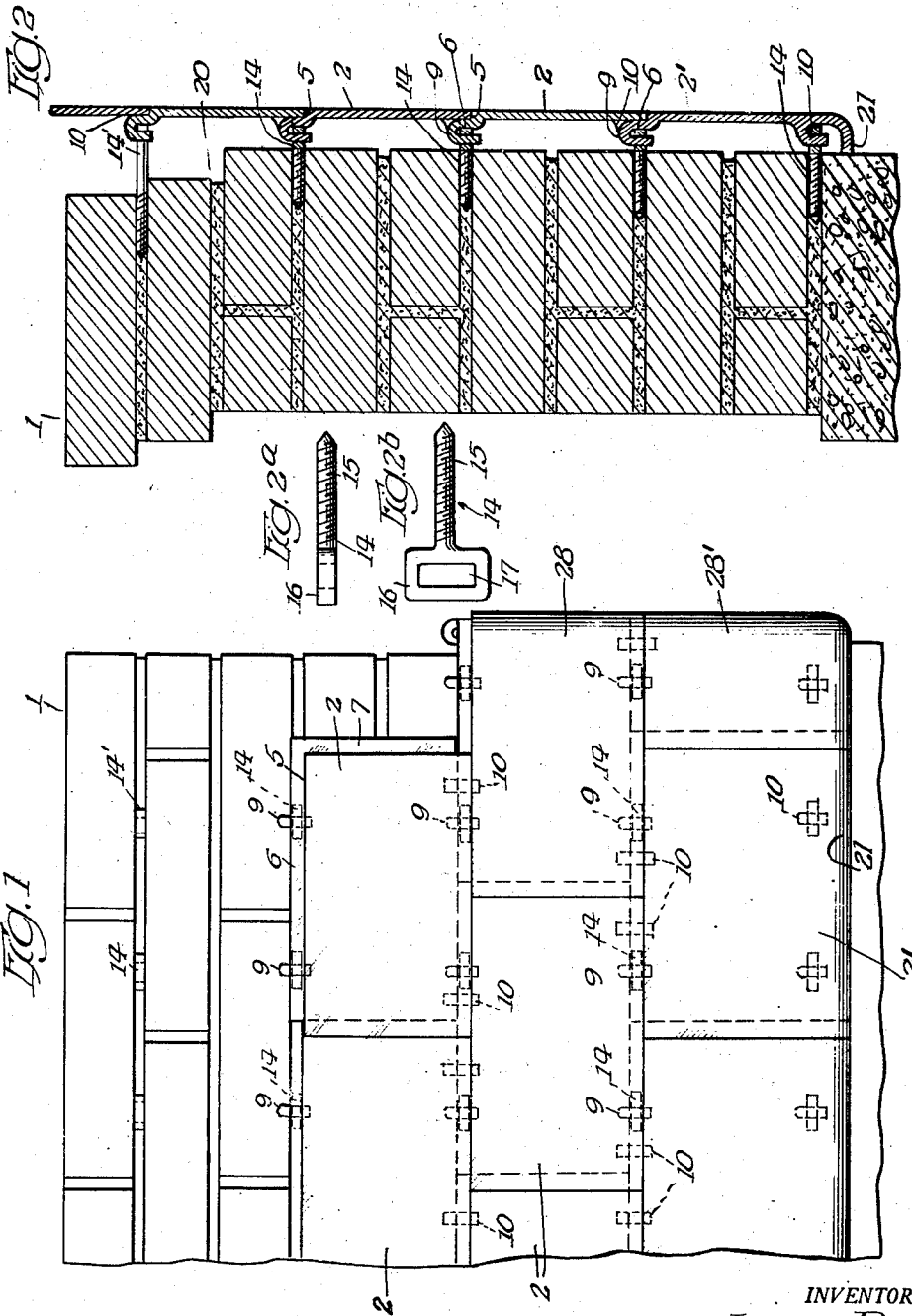
J. ROE

2,432,445

WALL OR ROOF TILE

Filed May 12, 1943

3 Sheets-Sheet 1



INVENTOR.

James Roe

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Dec. 9, 1947.

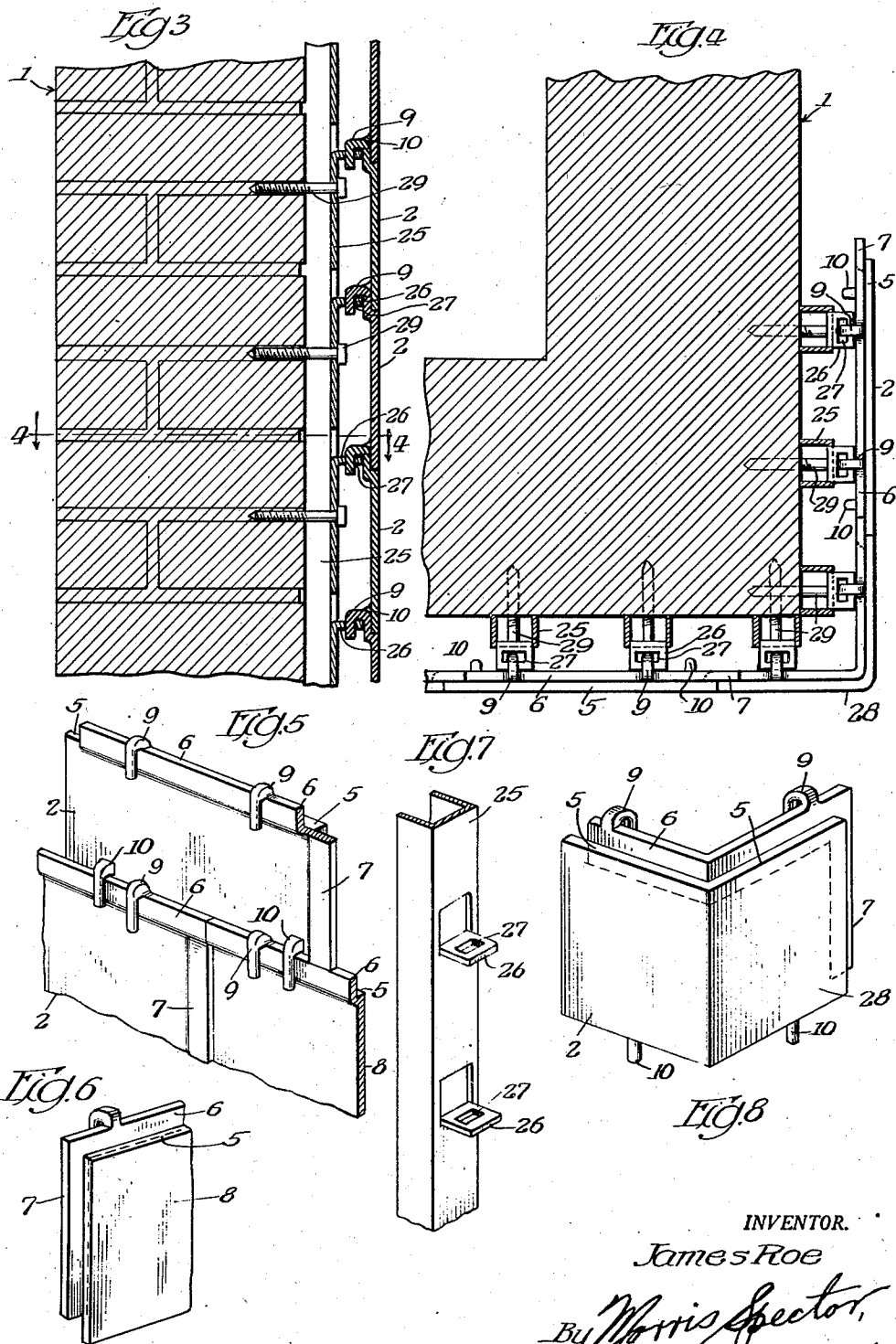
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3 Sheets-Sheet 2



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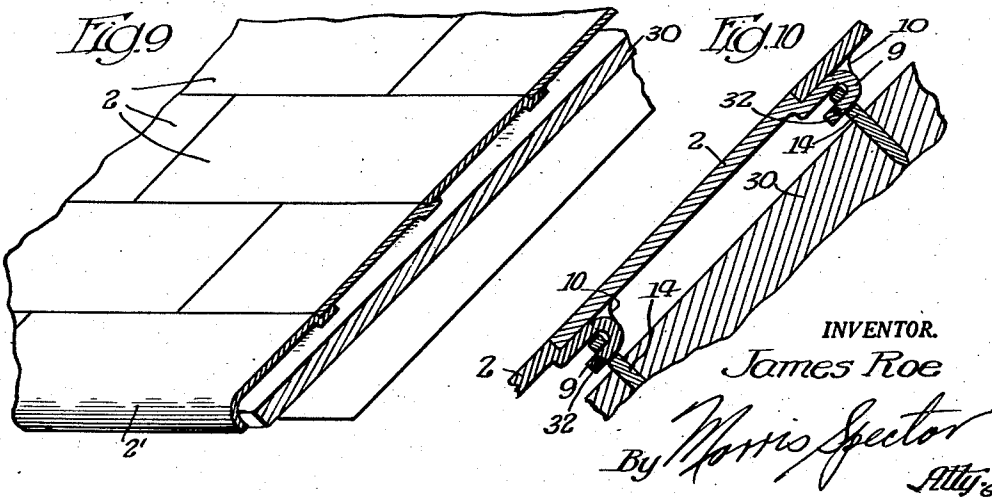
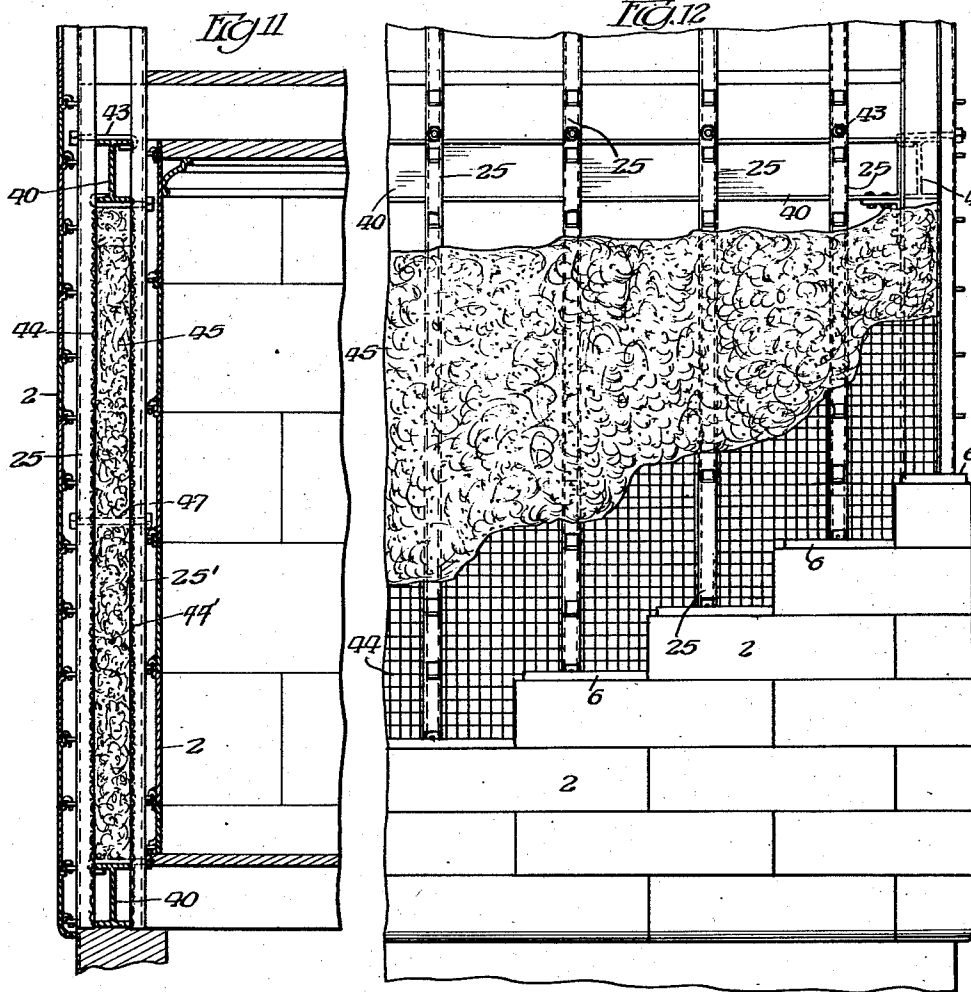
**J. ROE**

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WALL OR ROOF TILE

Filed May 12, 1943

3 Sheets-Sheet 3



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## UNITED STATES PATENT OFFICE

2,432,445

## WALL OR ROOF TILE

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6 Claims. (Cl. 72-18)

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This invention relates to the construction of building walls and to coverings applicable to walls or roofs of buildings, to ceilings, etc.

It is one of the objects of the present invention to provide an improved wall construction applicable to buildings of the type that are provided with supporting columns or other means for relieving the wall of the load due to the weight of the building. Modern tall buildings are provided with a framework that carries the entire dead load of the building, the brick walls being provided essentially for protection from the elements. It is one of the objects of the present invention to provide a wall structure for such a building which can be placed in position very quickly. The wall structure consists of a series of interfitting elements each of which is hung in place and which together form a smooth, continuous outer wall surface. A similar or different wall may be formed on the inner side of the steel skeleton frame. The space between the inner and outer walls is then filled with suitable insulation preferably, although not necessarily, a blown-in type of insulation, such as, for instance, rock wool.

It is a further object of the present invention to provide a building element capable of use as a wall covering or roof covering for buildings already constructed, where a change in the front wall surface is desired either for artistic reasons, or for weather protection, or for heat or cold insulation purposes.

It is a still further object of the present invention to provide preformed interfitting wall covering or forming elements which are capable of withstanding a wide range of weather conditions and which will remain intact and of presentable appearance even though a certain limited amount of distortion may take place in the wall or other base that is covered by the elements.

It is a further object of the present invention to provide a wall covering of preformed interfitting elements which may be easily applied or replaced with a minimum of labor.

The attainment of the above and further objects of the present invention will be apparent from the following specification taken in conjunction with the accompanying drawings forming a part thereof.

In the drawings:

Figure 1 is a front view of a portion of a building wall to which the covering of the present invention is being applied;

Figure 2 is a transverse sectional view of the wall of Figure 1;

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Figure 2a is an end view of one of the securing elements of Figure 1;

Figure 2b is a top view of the securing element of Figure 2a;

Figure 3 is a sectional view corresponding to Figure 2 and showing an alternate means for mounting wall coverings of the present invention in place;

Figure 4 is a sectional view, through a corner of a building to which the wall coverings of the present invention have been applied;

Figure 5 is a perspective view showing the rear of adjacent wall elements of the present invention;

Figure 6 is a perspective view of the front of a part of one of the building elements of Figure 5;

Figure 7 is a perspective view of a mounting channel used in Figure 3;

Figure 8 is a perspective view of one of the corner wall covering elements;

Figure 9 is a fragmentary perspective view illustrating the application of wall covering elements of the present invention to a roof;

Figure 10 is an enlarged sectional view through one of the roof elements of Figure 9;

Figure 11 is a transverse sectional view through the wall of another building embodying the present invention; and

Figure 12 is a broken away front view of the wall of Figure 11.

Throughout the drawings like reference numerals designate like parts.

Figures 1 and 2 show a wall 1, of brick or the like, which is part of an already built structure, and which is being covered by facing elements of the present invention. The facing elements or wall plates are indicated at 2 and consist in general of rectangular slabs provided with means for hinging the respective slabs and means for interfitting adjacent slabs to form water-tight, airtight joints. Each slab is preferably made of a plastic material which is non-hygroscopic and fire resistant, and which is not adversely affected by weather. Any thermo-plastic, thermo-setting, or synthetic resin material which answers these purposes and which affords a presentable appearance is suitable for the purpose. Each slab is of a generally rectangular shape, as may be seen from Figures 1, 2 and 5, and may be formed by molding or pressing the material to the required shape. The front face of each facing element or plate is flat. At the top of the element there is provided a shoulder 5 and an offset flange 6, the shoulder 5 being of a width exactly equal to the thickness of the facing element. Likewise, at one

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vertical edge of the facing element there is provided an offset flange 7 set back from the front surface 8 of the facing element an amount equal to the thickness of the facing element. Two supporting hooks 9—9 extend rearwardly and downwardly from the offset 6. Two interlocking hooks 10—10 project from the rear surface of the facing element adjacent the bottom thereof. The innermost vertical surface of each hook 10 is spaced from the rear surface of the element 2 an amount only slightly in excess of the thickness of the flange 6, so that a flange 6 of a subjacent element 2 fits snugly between the hooks 10 and the rear surface of a superposed element 2. The hooks 9—9 of a facing element are preferably spaced a distance equal to half of the exposed length of the element and equal distances from the center of the exposed edges. This brings the hooks 9 of successive tiers or courses of facing elements in alignment. The facing element, including the hooks thereof, constitutes one integral cast or pressure molded structure.

To mount the facing elements in place securing elements 14, such as shown more particularly in Figures 2a and 2b, are provided. These elements may be made of non-corrosive metal or of plastic material like the facing elements 2. Each securing element includes a roughened shank portion 15 adapted to be driven into the mortar between the joints of the brick wall in much the same manner as a nail would be driven, and a head 16 having an eye 17 for receiving the hooks 9. The eye 17 is of a rectangular shape and is of a width, in a direction lengthwise of the shank 15, equal to the thickness of the hook 9. Its length in a direction at right angles to the shank 15 is appreciably greater than the corresponding dimension of the hook 9. This permits a limited amount of adjusting movement of the facing element on the securing element, thus eliminating the need of extreme precision in the positioning of the securing elements 14 in the building wall. Also, should the building wall later skew or become otherwise slightly distorted, there is a certain limited amount of permissible movement of the securing elements 14 with respect to the facing elements or plates 2 hanging therefrom.

To mount the facing elements in place the securing elements 14 are first positioned in proper alignment both vertically and horizontally and appropriately spaced apart. Thereafter the facing elements are hung from the securing elements. To that effect the lowermost facing elements are first positioned and thereafter the succeeding facing elements are placed progressively upwardly from below. The bottom of each facing element rests on the top shoulder 5 of its subjacent element, the front surfaces of the respective elements being perfectly flush so that the front wall is flat. If there is an offset in the building wall 1, as indicated, for instance, at 20 in Figure 2, the corresponding securing element 14' is longer than the others so that the eye 17 thereof is in alignment with the eyes of the other securing elements 14. Each facing element hangs from the eyes of two securing elements 14 by means of the hooks 9. The hooks 10 of each facing element fit behind the offset 6 of the subjacent facing element and thus hold the bottom of each facing element in place and flush with its subjacent facing element. In any one row or course of facing elements one edge of each element overlies the offset 7 of the preceding element. Thus at each of the joints of the element

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there is provided an overlap which prevents the entrance of moisture or wind through the facing wall.

If desired the adjacent elements may be secured together at their joint by a suitable plastic cement or even by mortar. If a plastic cement is used it is preferable to use a cement which is a solvent for the plastic of the facing element. This cement is painted onto the shoulder 5 and offsets 6 and 7 of each facing element immediately before the next facing element is to be positioned. When the solvent or cement dries it firmly bonds the two elements uniting them integrally into one structure.

It is to be noted from Figure 2 that the bottom edge of the lowermost facing element is of a somewhat different shape from that of all the other facing elements. In the case of the lowermost facing element, indicated at 2', there is provided a lower lip 21 which extends the full length of the facing element and which abuts against the brick of the building to form a bottom closure for the space between the brick wall and the facing that is applied thereto. In the case of the lowermost facing element there are provided two additional securing elements 14 for receiving the hooks 10 which in the other facing elements merely hook in back of the offset 6 of the subjacent element.

Figure 7 shows an alternate means for mounting the facing element upon a wall, and Figures 3 and 4 show the application of the mounting means to a wall. The mounting means of Figure 7 consists of a channel strip 25 having lugs 26 stamped outwardly from the web of the channel, each lug having a rectangular hole 27 formed therein of a shape corresponding to the shape of the eye 17 of the securing element 14 previously described. The spacing of adjacent lugs 26—26 in the channel 25 is made equal to the height of the exposed front surface of one of the facing elements or plates 2. Channels 25 are mounted vertically on the wall 1 in any desired manner as, for instance, by nails or screws 29 driven into the joints between the bricks.

Figure 8 is a perspective view of a corner facing element 28. This facing element is essentially the same construction as the facing element 2 in that it provides front flat surfaces at the top of which there is a shoulder 5 and a vertically extending rearwardly displaced offset 6 having hooks 9 and along one side of which there is an offset 7 the purpose of which is believed to be apparent from the description previously given. Also, at the bottom rear surfaces of the corner facing element there are the hooks 10 for the same purpose as the correspondingly numbered hooks are provided on the element 2. The lowermost corner element 28' is provided with the closure ledge 21 as are the lowermost elements 2'.

If desired, heat insulation may be provided between the front of the wall 1 and the back of the facing elements. The insulation may be applied as each course or row of elements is laid, or it may be blown in after all or an appreciable part of the wall surface or covering has been mounted.

While I have here described facing elements as applied to a vertical wall surface of a building, it is within the purview of the present invention to apply these same facing elements to a horizontal or to an inclined portion of the building as, for instance, to an inclined roof. This is illustrated in Figure 9 wherein the elements 2 are

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mounted on an inclined roof 30 by means of securing elements 14 of the same construction as illustrated in Figures 2a and 2b or by mounting channels 25 of Figure 7, previously described. The lowermost element 2' is of a construction the same as the element 2' of Figures 1 and 2. In dealing with a roof it may be necessary to lock the individual elements against upward shifting, since such a tendency may take place during violent wind storms. In such cases, especially in the case of a roof only slightly inclined, the wind forces may be such as to tend to force the entire roof to slide upwardly. To prevent such action the end of each hook 9 of the facing elements is provided with a small bore therethrough. Through this bore a cotter pin or similar securing element 32 is passed after each facing element has been positioned and before the next succeeding element has been put in place. The cotter pins thus serve to hold the facing elements against shifting out of the eye of the securing elements 14.

In the case of a roof structure the shoulder 5 and offset 6 may be omitted. When that is done the offset 6 is flush with the front surface of the facing element and therefore there is an overlap of each succeeding tier over the upper end of the preceding tier. This facilitates drainage.

While I have shown the facing elements of the present invention as applied to the outer wall surface of a building or to a roof of a building, it is within the purview of the present invention to apply the same elements to an inner wall surface of a room of a building or to apply them to a ceiling of a building. In that case the facing elements are mounted in place in exactly the same manner as previously described, that is, by means of individual securing elements 14 or by means of stamped out channels, as illustrated in Figure 7. When that is done one edge of each facing element is held against downward movement by a securing element 14 or 25, and the opposite edge of the facing element is held by the preceding facing element.

Reference may now be had to Figures 11 and 12 wherein the present invention is shown as applied to inner and outer wall surfaces of a skeletonized steel building structure. In this case there are shown horizontal I-beams 40—40 that are supported by vertical columns 41, as is usual in steel building constructions. Each horizontal beam 40 supports the usual floor joists and ceiling joists, the beams 40 being displaced from one another to the extent of one story of the building. Channels 25 are secured in spaced parallel relationship to the I-beams 40—40, each channel preferably extending vertically one full story of the building, with aligned channels of successive stories of the building nestled together at the beam 40. Each channel 25 may be secured to the I-beams 40 in any desired manner as, for instance, by J-bolts 43 each of which hooks over the flange of the I-beam 40 and is provided with a threaded nut that bears against the outside of the web of the channel 25. It is, of course, understood that any other desired means may be used for rigidly securing the channels 25 in place. The outer facing elements 2 are hung on the lugs 26 of the channels 25 in the same manner as was previously described. Thereafter a screen 44 is positioned against the flanges of the channels 25. The screen may be of any desired construction and may be expanded metal, wire, or other type of screen satisfactory for the purposes for which it is provided, as hereinafter set

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forth. After the screen 44 has been positioned and tied in place to the channels 25 at a number of places another similar screen 44' is mounted in place and then another set of channels 25', similar to the channels 25, are mounted in place. Thereafter facing elements 2 are hung from the channels 25', which are of a construction the same as that of the channels 25. Opposite channels 25—25' may be tied together approximately midway between the two floors, as by bolts 47, to stiffen the construction. One or more tying bolts may be provided for each pair of channels 25—25'.

After the facing elements have been mounted in place on the inner and outer walls, the space between the screens 44—44' is filled with insulation 45. Any preferred type of insulation may be used, for instance, blown-in type of insulation such as, by way of example, rock wool. If desired the insulation may be placed in the space between the screens 44—44' even before the inner wall surface has been mounted. When this is the case other or non-blown-in types of insulation may be provided. The purpose of the screen 44—44' being merely to confine the insulation. When preformed insulating blocks are used the screens 44—44' may be entirely omitted. It is within the purview of the present invention to use any of the known types of insulation.

From the above description it is apparent that there is here provided a simple and economical wall structure to be built up in the initial erection of a building, which will require a minimum amount of labor and which will not require scaffolding in the forming of the outer wall surface. In addition, it is apparent that the wall illustrated in Figures 11 and 12 is of very much less weight than a corresponding wall of solid or hollow brick tiles of equal insulating properties. It is also apparent that the outer wall surfacing may be used independently of the inner wall surfacing. Furthermore, it may be seen that the insulation that is provided in a wall is supported at each floor by the corresponding horizontal beams 40. This prevents packing of the insulation which might otherwise take place.

In compliance with the requirements of the patent statutes I have here shown and described a few preferred embodiments of my invention. It is, however, to be understood that the invention is not limited to the precise constructions here shown, the same being merely illustrative of the principles of the invention. What I consider new and desire to secure by Letters Patent is:

1. A building facing element comprising a flat rectangular plate of substantially uniform thickness having a flange along the top thereof, the front surface of the flange being parallel to the front surface of the rest of the facing element and rearwardly offset therefrom an amount substantially equal to the thickness of the element, downwardly directed supporting hooks projecting rearwardly from the facing element at the upper part thereof, and locking hooks projecting rearwardly from the facing element at the bottom thereof and adapted to receive a flange of a similar building element, said supporting hooks and said locking hooks being of the same material as and integral with the plate.

2. A building facing element comprising a flat rectangular plate of substantially uniform thickness having a continuous flange of uniform thickness extending along the top and one adjacent side thereof, the front surface of the flange being

parallel to the front surface of the rest of the facing element and rearwardly offset therefrom an amount substantially equal to the thickness of the element, the flange terminating short of the other side of the plate at the top thereof by an amount equal to the width of the flange, and terminating short of the bottom of the plate by an amount equal to the height of the flange, and downwardly directed supporting hooks projecting rearwardly from the facing element at the upper part thereof.

3. A building facing element comprising a flat rectangular plate of substantially uniform thickness having a continuous flange of uniform thickness extending along the top and one adjacent side thereof, the front surface of the flange being parallel to the front surface of the rest of the facing element and rearwardly offset therefrom an amount substantially equal to the thickness of the element, the flange terminating short of the other side of the plate at the top thereof by an amount equal to the width of the flange, and terminating short of the bottom of the plate by an amount equal to the height of the flange, downwardly directed supporting hooks projecting rearwardly from the facing element at the upper part thereof, and locking hooks projecting rearwardly from the facing element at the bottom thereof and adapted to receive a flange of a similar building element.

4. A wall plate having a flat front surface and having rearwardly offset flanges parallel to the front surface and extending along the top edge and one adjacent edge of the plate, a pair of downwardly directed supporting hook members integral with and projecting from the rear of the wall plate adjacent the top thereof, and a pair of downwardly directed locking hook members integral with and projecting from the rear of the wall plate adjacent the bottom thereof for locking behind the top offset flange of a subjacent plate in a wall.

5. A wall plate having a flat front surface and having rearwardly offset flanges parallel to the front surface and extending along the top edge and one adjacent edge of the plate, a pair of downwardly directed supporting hook members integral with and projecting from the rear of the

wall plate adjacent the top thereof, and a pair of downwardly directed locking hook members integral with and projecting from the rear of the wall plate adjacent the bottom thereof for locking behind the top offset flange of a subjacent plate in a wall, the inner surface of each bottom hook being spaced from the adjacent rear surface of the wall plate an amount only slightly in excess of the thickness of the top offset flange.

6. A building facing element comprising a comparatively thin flat plate of non-hygroscopic plastic material and having spaced rearwardly projecting downwardly directed supporting hooks adjacent the top thereof and spaced rearwardly projecting locking hooks adjacent the bottom thereof, the bottom of the facing element being rearwardly curved to form a continuous rearwardly projecting closure flange extending the full length of the plate and terminating adjacent an end of the plate to form a continuous flange with the closure flange of an adjacent element.

JAMES ROE.

#### REFERENCES CITED

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

#### UNITED STATES PATENTS

| Number    | Name      | Date          |
|-----------|-----------|---------------|
| 569,002   | Boehm     | Oct. 6, 1896  |
| 587,263   | Lanyon    | July 27, 1897 |
| 664,705   | Anderson  | Dec. 25, 1900 |
| 664,707   | Anderson  | Dec. 25, 1900 |
| 825,304   | DuMontier | July 10, 1906 |
| 1,632,421 | Stevenson | June 14, 1927 |
| 1,882,529 | Thulin    | Oct. 11, 1932 |
| 2,120,195 | Valenti   | June 7, 1938  |
| 2,156,277 | Corbin    | May 2, 1939   |
| 2,151,447 | Stanley   | Mar. 21, 1939 |
| 2,210,115 | Dodds     | Aug. 6, 1940  |
| 2,213,355 | Woodworth | Sept. 3, 1940 |
| 2,262,899 | Mechlin   | Nov. 18, 1941 |
| 2,321,860 | Ruppel    | June 15, 1943 |

#### FOREIGN PATENTS

| Number | Country       | Date |
|--------|---------------|------|
| 9,916  | Great Britain | 1911 |