

June 22, 1954

ERNEST KATZ
NOW BY JUDICIAL CHANGE OF NAME
ERNEST HENRY CASSON
BUILDING ELEMENTS AND BUILDING STRUCTURE

2,681,714

Filed Aug. 9, 1947

2 Sheets-Sheet 1

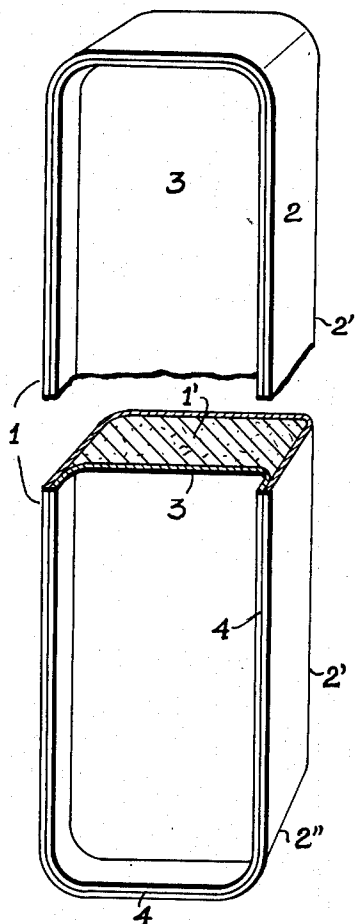


Fig. 2

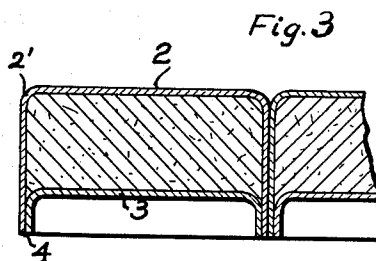


Fig. 3

Fig. 4

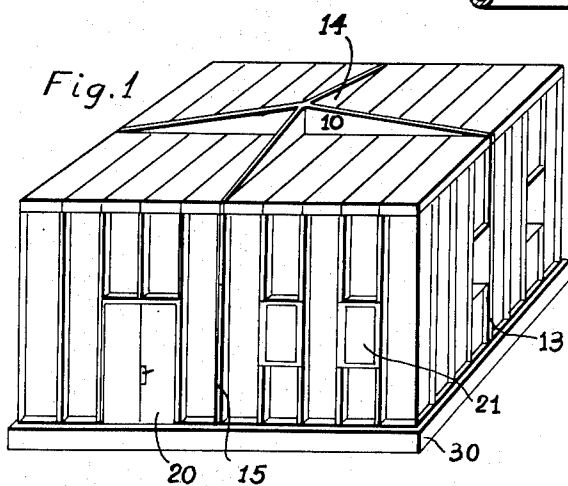
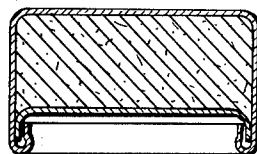


Fig. 1

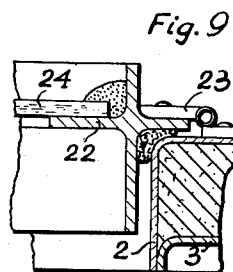


Fig. 9

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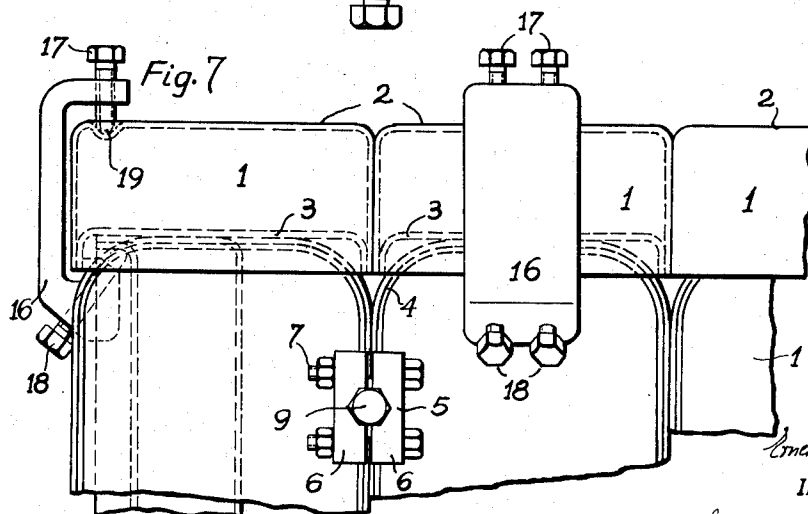
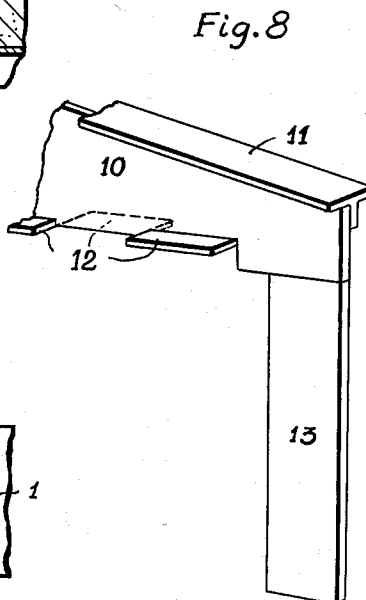
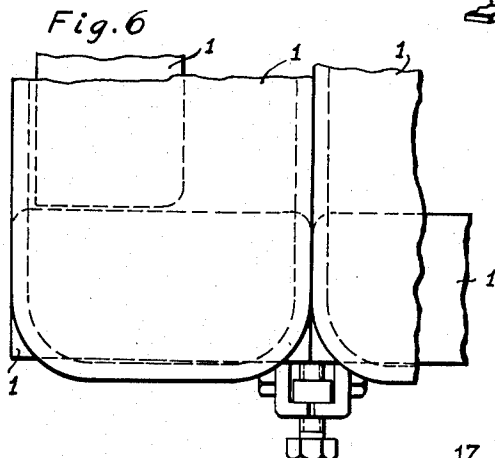
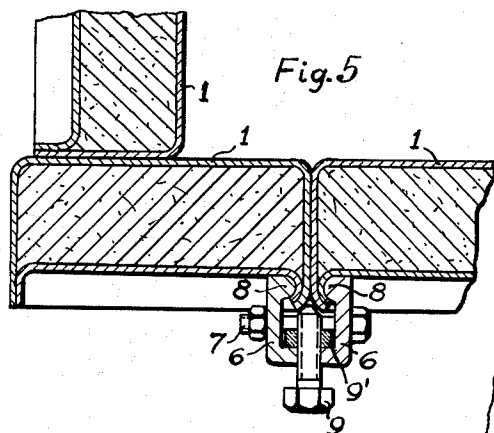
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,681,714

BUILDING ELEMENTS AND BUILDING
STRUCTUREErnest Katz, Haifa, Israel, now by judicial change
of name Ernest Henry CassonApplication August 9, 1947, Serial No. 767,713
In Great Britain January 22, 1945Section 1, Public Law 690, August 8, 1946
Patent expires January 22, 1965

2 Claims. (Cl. 189—2)

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The scarcity of timber, the extraordinary progress of later times in the utilisation of aluminium, and the need for a quick and easy production of housing were the incentives to the present invention.

According to the invention the building elements are composed of elongated drawn relatively deep troughs of metal, preferably aluminium closed by covers, formed by like, but relatively shallow trays, inserted into the troughs so that the margins of the troughs project beyond the plane of the covers and can be connected by clamping means with the margins of juxtaposed elements. The troughs are filled with a heat insulating material prior to being closed by covers. The elements are preferable exhausted of air. Out of these elements walls are formed by positioning the elements in an upright way and with their projecting margins to the outside of the building, where the vertical margins are connected by clamping means. The roof is formed by elements positioned with their projecting margins directed downwards and elements of the walls entering with their ends into the space between the margins of the roof-elements. The roof-elements are connected to the wall-elements by clamping means engaging underneath the margin of the elements and into depressions provided in the wall of the roof-elements. The term aluminium whenever used in this specification includes also aluminium alloys.

The invention is shown by way of example in the annexed drawings, wherein

Fig. 1 is a perspective view of a building composed of elements according to the invention.

Fig. 2 is a like view of the new building element, partly in section.

Fig. 3 is a cross-sectional view of two juxtaposed elements, partly broken away.

Fig. 4 shows a cross-section of a further modification of the element.

Fig. 5 shows a cross-section of elements adjoining at a corner of a building.

Fig. 6 is a plan of the roofed building at that corner.

Fig. 7 is an elevational view of an upper corner of a building.

Fig. 8 is a partial perspective view of the girder and its support used in connection with a roof as shown in Fig. 1.

Fig. 9 shows a fractional horizontal cross-section of a metal window frame hinged to a building element.

Each box like element (see Fig. 2) is composed of two parts 2, 3 of sheet aluminium, a bottom

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part 2 being formed by cupped or drawn relatively deep trough, and a cover part 3 formed by a like relatively shallow tray fitting with its upturned edges into part 2 and directed with its hollow side outwardly. The edges of both parts form a projecting margin 4 of an elongated flat four sided closed prismatic element 1. Prior to connecting of the parts, part 2 is filled with a heat insulating material 1', like disintegrated cork or peat. The closed boxes are preferably exhausted of air. The edges 2' around the bottom of part 2 have a relatively sharp bend, while its lateral edges 2'' are much more rounded off.

The elements may be standardized and have a length equal to that of the storey and to a multiple of their width. The elements can be assembled to form walls by placing them temporarily on the ground one beside the other with the projecting margins 4 upside. The longitudinal margins 4 of each two neighboring elements are at a few points connected with each other by clamping devices 5 (see Fig. 5). These devices consist of two jaws 6 adapted to be pressed against each other by throughgoing screws 7. The jaws 6 have on their inner side thickened lips 8 between which the upturned margins 4 of two neighbouring elements enter. By tightening the screws 7 the margins of two neighbouring elements are firmly pressed together and the two elements thus fixedly united. After compressing the edges of the elements by means of the screws 7 their outermost rims can be spread apart at the points of compression and rolled around the lips 8 by the ends of screws 9 screwed into nuts 9' located within the clamping device being urged between them, thus increasing the strength of the union. The so assembled wall is righted and erected with the margins 4 directed to the outside of the building on a previously prepared foundation 30. The upper surface of the foundation as well as the contacting surfaces of the elements are prior to their assemblage covered with a layer of a not hardening rubber solution, asphalt or the like substance adapted to make the joints water tight. The arrangement of the elements at the corner formed by two walls meeting at right angles is shown in Fig. 5. The adjoining walls are held together by the roof structure (see Figs. 1, 6, 7). The roof (see Fig. 1), is composed of two rows of elements which are identical with the elements of the walls. They are placed one beside the other with the projecting margins downwards, according to Fig. 1. The outermost elements of each row lie upon four elements of a

lateral wall and one element of an adjoining front wall. The intermediate roof elements are supported each at its narrow outer end on a narrow upper end of a wall element and at its inner end on a girder 10 of plate aluminium located in a vertical plane between the two rows and extending from the right to the left wall. The upper border of the girder is reinforced by a T-section 11. The lower border of girder 10 (see Fig. 8) has several incisions and the flaps 12 produced by the incisions are alternately bent to the front and to the rear. They constitute flanges upon which the inner ends of the roof elements are rested. The two ends of the girder are straight and rest each on the upper ends of vertical plates 13 of aluminium clamped between two middle elements of the lateral walls. The girder 10 may further be supported in its middle by a flat girder 14 of aluminium extending from the front to the rear. Girder 14 has no lateral flaps or flanges. It is composed of two parts welded at their inner ends to girder 10 and resting with their outer ends on the upper ends of vertical plates 15 of aluminium clamped between two middle elements of the front and rear walls.

The wall and roof elements are fixed to each other by means of angular clamps 16 (see Fig. 7). The clamps are provided at their inner ends with screws 17, 18, screw 17 penetrating into a depression 19 provided in the wall of a roof element, and screw 18 pressing the margin 4 of a wall element against the parts 3 of a roof element.

Doors 20 and windows 21 are easily built in by having the same width (see Fig. 1) or a multiple of the width of a building element. The spaces above the doors and above and below the windows are filled with elements 1 of a shorter length. The doors and windows may be of any construction, but for the windows an aluminium frame 22 of a cross-shaped section is used, as shown in Fig. 9, which can be easily attached to the wall elements 1 by means of hinges 23 and into which the panes 24 are inserted in the usual way. A rubber strip 25 is placed around the window frame in the angle of the cross-shaped section adjacent to the corners of the neighbouring elements 1 for assuring a tight closure.

Several constructional details may be modified. So for instance the connection of the trough-like parts 2 of the elements 1 with their covers may be effected in the way shown in Fig. 4, according to which the cover 3 has the same shape of a tray like Fig. 2, but the edges of the box are tightly bent over the edges of the cover. Instead of the shown clamping means simple screws or rivets may be used for uniting the margins of the elements of the walls. The elements may be painted or subjected to some chemical treatment of their outer surfaces by dipping the whole elements into a suitable bath. Since the air in the elements is exhausted, the walls of the elements will not bulge outwards, as would be the case with the air expanding in the elements in summer times. On the other hand a bulging to the inside of the elements is counteracted by the filled in insulating material.

It can thus be seen that there has been provided, according to this invention, a building structure which comprises at least two adjacent building elements adapted for connection with each other, each element being provided with a relatively deep rectangular-shaped trough body having a bottom wall, two side walls, and two

end walls, rounded corners connecting said side walls to said bottom wall and said end walls to said side walls, respectively, said side walls and said end walls of said trough body terminating in an outermost marginal edge, a relatively shallow rectangular-shaped tray body having a bottom wall, two end walls, and two side walls connected to the latter, said side walls of said tray body being conformed to the shape of the side walls of said trough body and being nested in the latter and forming with the corresponding end walls of said tray body an outermost marginal edge, the ends of said marginal edge of said tray body and of said marginal edge of said trough body substantially coinciding with each other in assembled condition of each element, said bottom wall of said tray body being spaced from the marginal edges of said trough body and of said tray body to an extent sufficient to accommodate, within the space defined by said bottom wall and said marginal edge of said tray body, portions of end walls of adjacent elements of similar construction, and clamping means connecting contiguous marginal edges of adjacent elements together, said clamping means including bulbous end portions for forcibly engaging with juxtapositioned side walls of adjacent tray bodies and further including a pointed and threaded member directed perpendicular to the bottom walls of said adjacent tray bodies for engagement between and to split apart said contiguous marginal edges of said adjacent elements to thereby conform said contiguous marginal edges to said bulbous end portions of said clamping means, thus increasing the strength of juncture between said adjacent elements.

I claim:

1. In a building structure; at least two adjacent building elements adapted for connection with each other, each element being provided with a relatively deep rectangular-shaped trough body having a bottom wall, two side walls, and two end walls; rounded corners connecting said side walls to said bottom wall and said end walls to said side walls, respectively, said side walls and said end walls of said trough body terminating in an outermost marginal edge, a relatively shallow rectangular-shaped tray body having a bottom wall, two end walls, and two side walls connected to the latter; said side walls of said tray body being conformed to the shape of the side walls of said trough body and being nested in the latter and forming with the corresponding end walls of said tray body an outermost marginal edge, the ends of said marginal edge of said tray body and of said marginal edge of said trough body substantially coinciding with each other in assembled condition of each element, said bottom wall of said tray body being spaced from the marginal edges of said trough body and of said tray body to an extent sufficient to accommodate within the space defined by said bottom wall and said marginal edge of said tray body a portion of an end wall of an adjacent element of similar construction, and clamping means connecting contiguous marginal edges of adjacent elements together, said clamping means including bulbous end portions for forcibly engaging with juxtapositioned side walls of adjacent tray bodies and further including a pointed and threaded member directed perpendicular to the bottom walls of said adjacent tray bodies for engagement between and to split apart said contiguous marginal edges of said adjacent elements to thereby conform said con-

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tiguous marginal edges of said adjacent elements to said bulbous end portions of said clamping means, thus increasing the strength of juncture between said adjacent elements.

2. In a building structure according to claim 1, wherein further adjacent elements are arranged at substantially right angles to each other, whereby trough portion of one of said further elements overlies and embraces a portion of an end wall of another of said further elements, and additional clamping means extend-

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ing from said one further element to said other further element to connect said further elements with each other.

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