Jan. 13, 1942. M. H. BRIGGS 2,270,161

PORTABLE BUILDING

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FIG. 1.

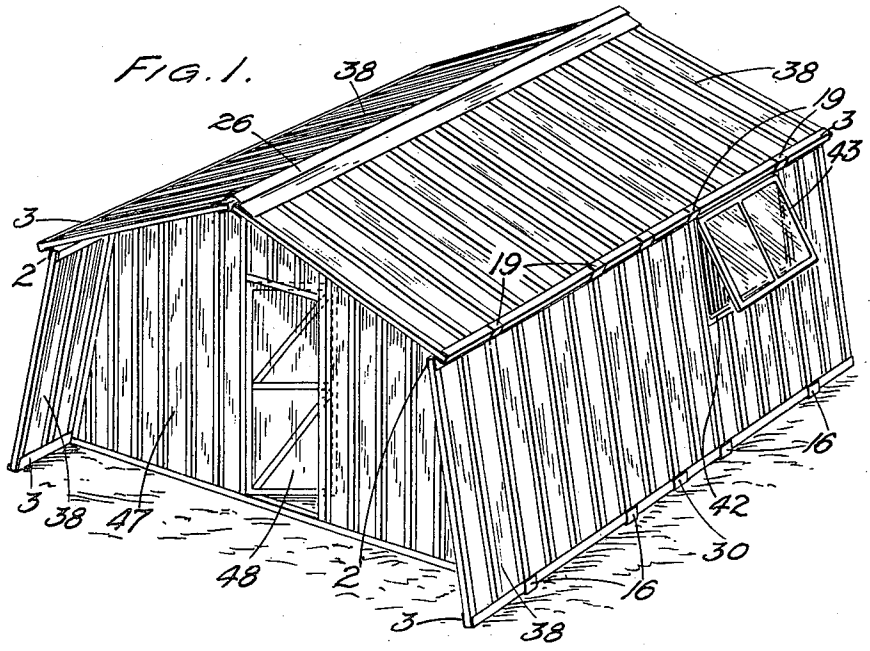
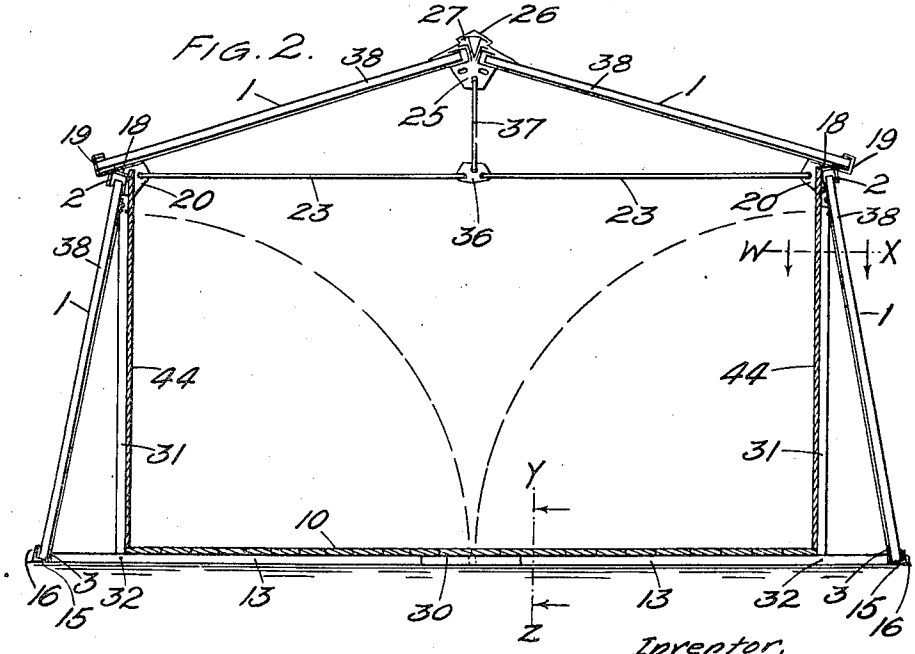


FIG. 2.



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PORTABLE BUILDING

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FIG. 3.

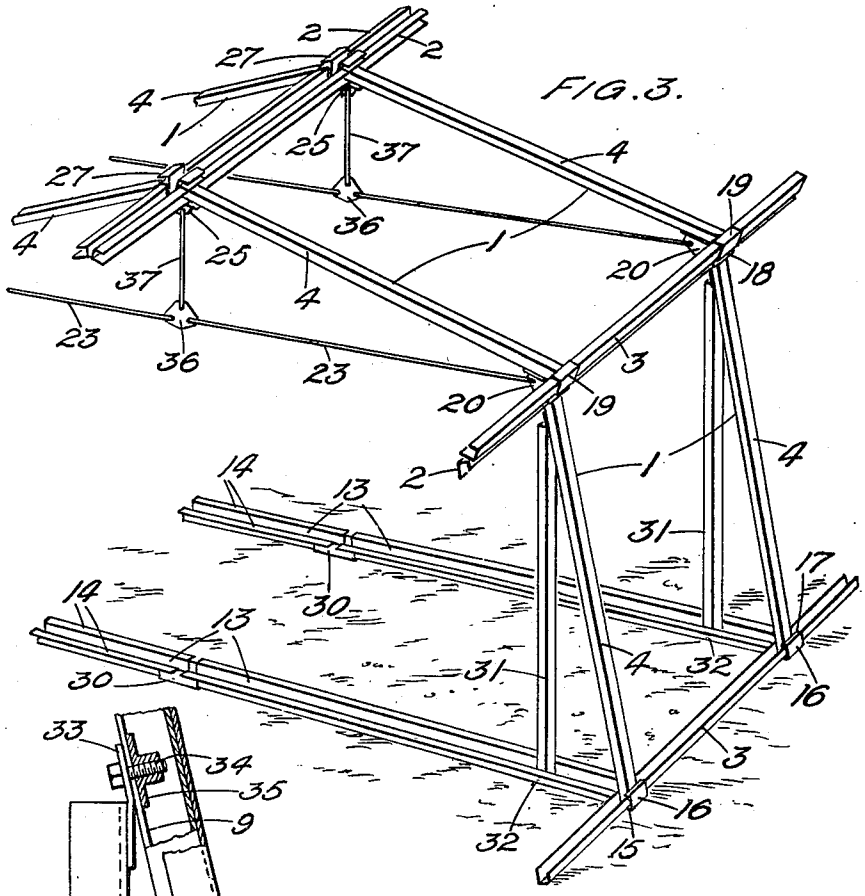

FIG. 4.

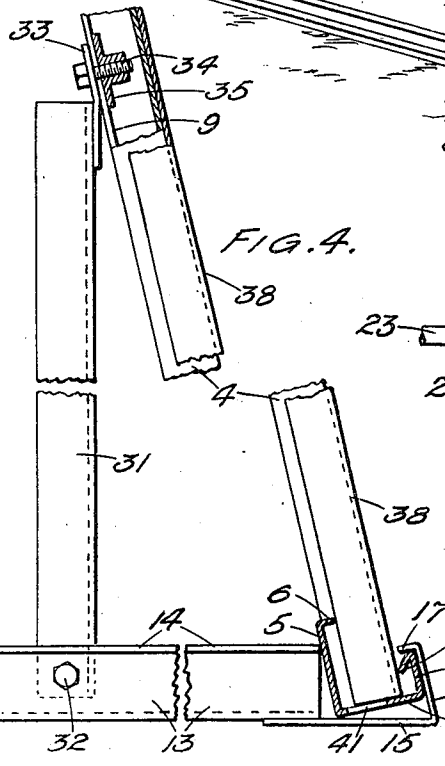

FIG. 5.

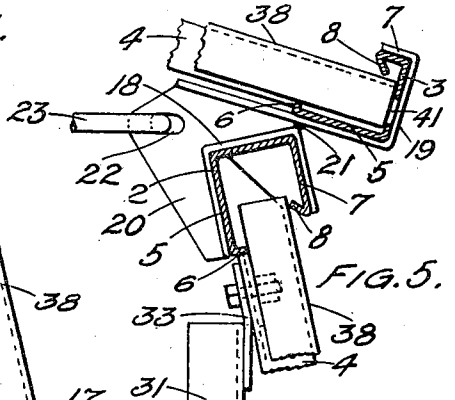

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FIG. 6.

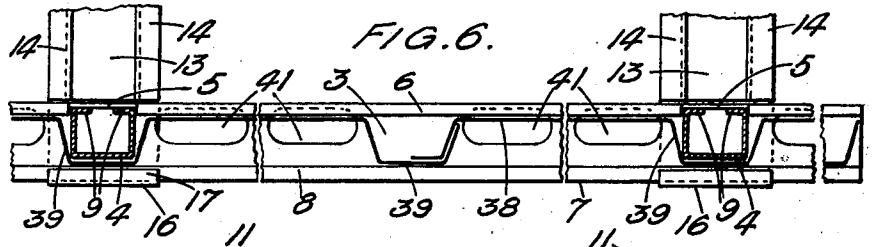


FIG. 7.

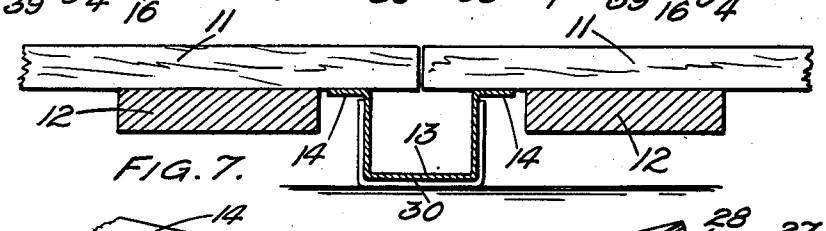


FIG. 8.

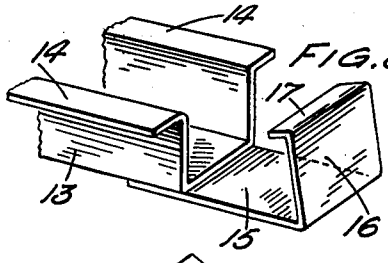


FIG. 9.

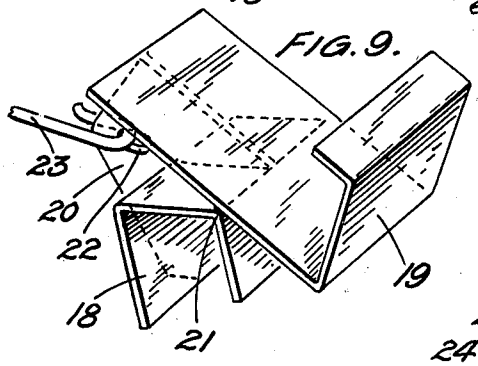


FIG. 10.

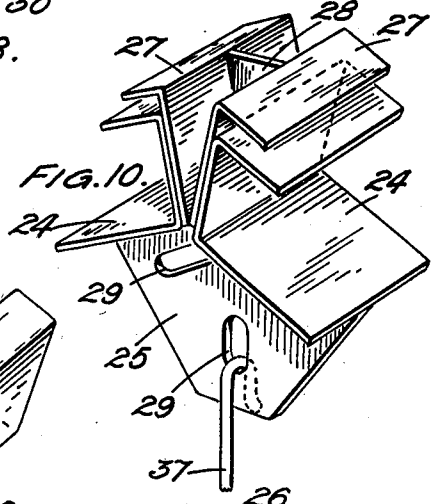


FIG. 11.

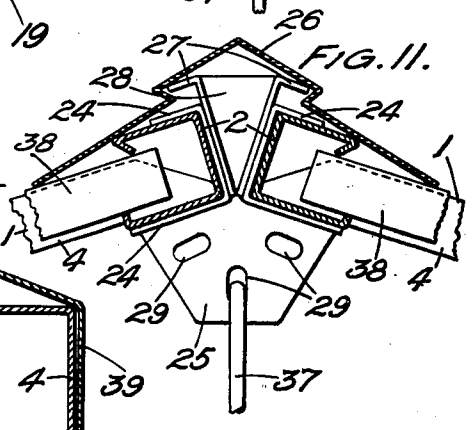
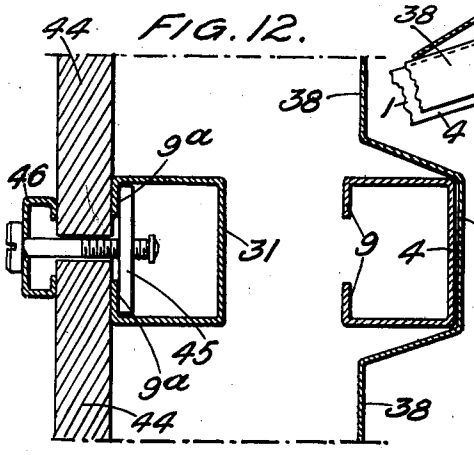


FIG. 12.



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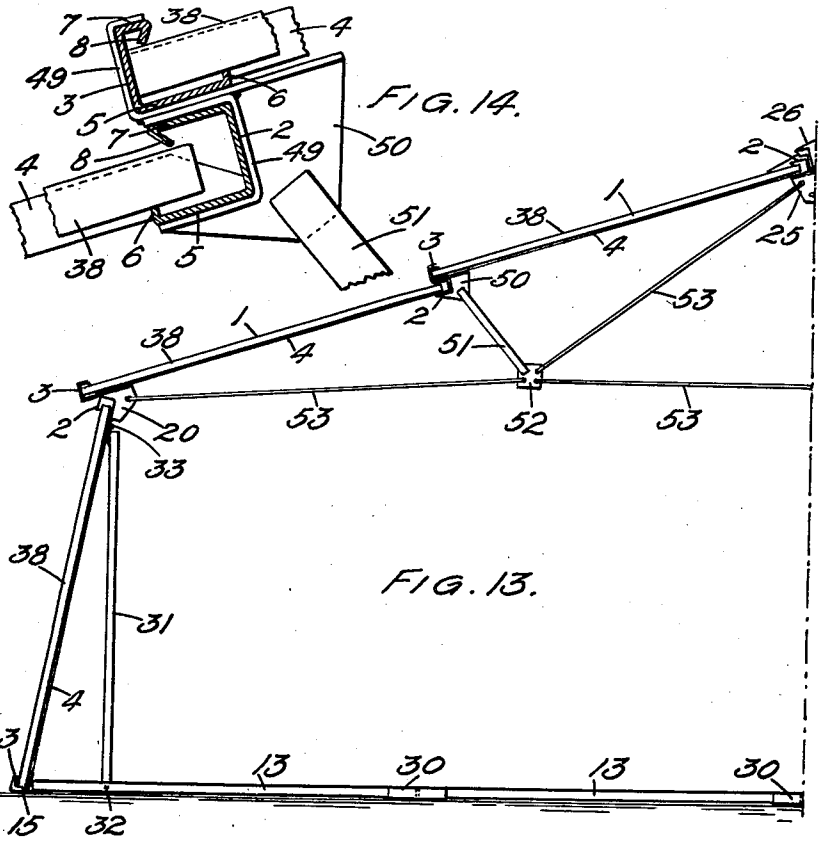

FIG. 14.

FIG. 13.

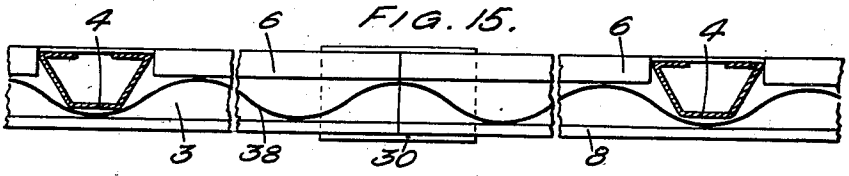

FIG. 15.

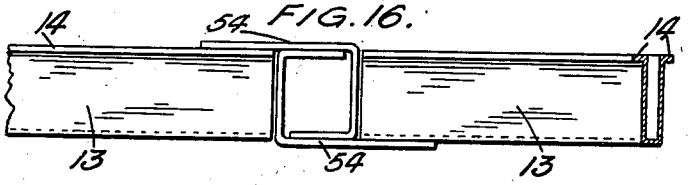

FIG. 16.

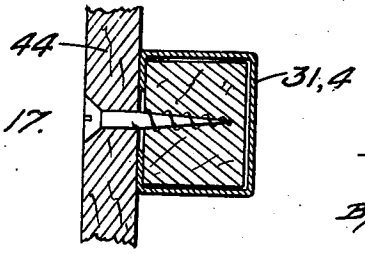

FIG. 17.

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PORTABLE BUILDING

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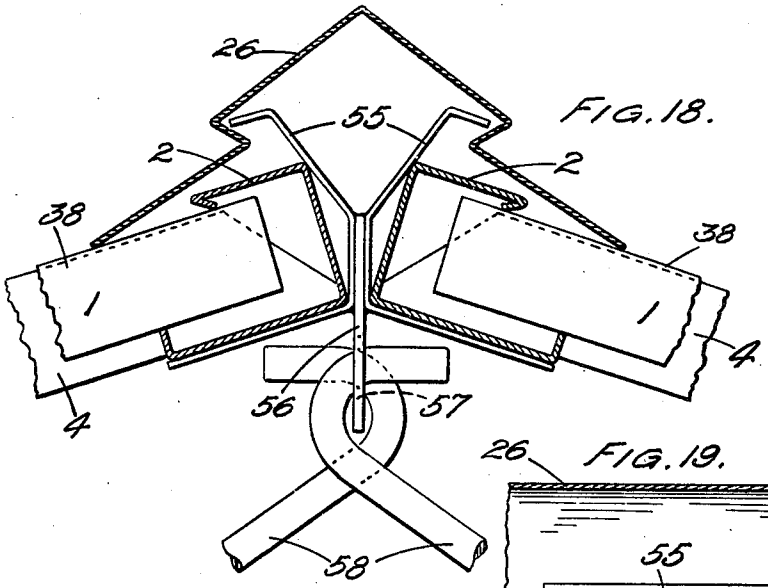

FIG. 18.

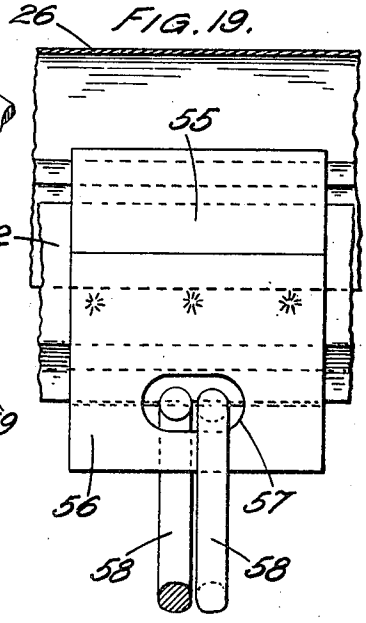

FIG. 19.

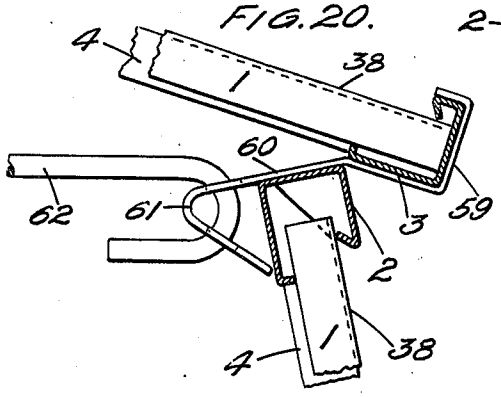

FIG. 20.

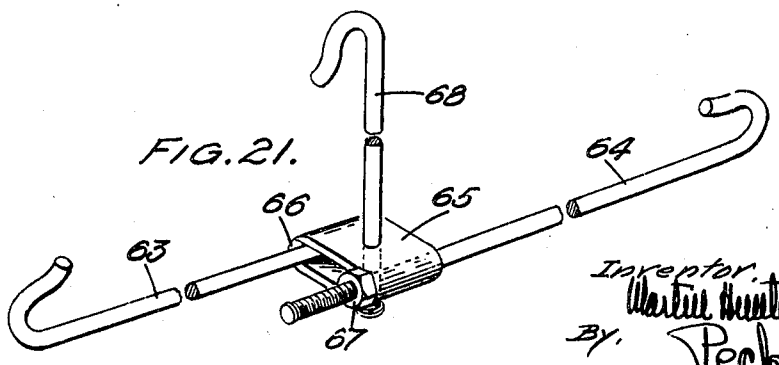

FIG. 21.

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UNITED STATES PATENT OFFICE

2,270,161

PORTABLE BUILDING

Martin Hunter Briggs, Coulsdon, England

Application May 16, 1940, Serial No. 335,604
In Great Britain June 15, 1939

14 Claims. (Cl. 189—2)

This invention relates to portable buildings and has for its main object the provision of a sectional structure which shall be capable of easy erection and dismantling by unskilled labour and shall require no detachable or "loose" bolts or the like for connecting the parts or sections. A further object is the arrangement of the sections in such a manner that buildings of various sizes, i. e. of different spans and/or lengths, may be produced from a minimum number of parts.

According to the invention a portable building comprises a plurality of skeleton frames capable of use in both walls and roofing structure, a plurality of members at floor or ground level and each having a socket-like formation adapted to receive the lower end of one of said frames erected to form parts of the walls of the building and a plurality of other members at eaves' level each having two socket-like formations the one adapted to receive the upper end of one of the said erected frames and the other adapted to receive the lower end of one of said frames disposed to form part of the roof of the building, the arrangement being such that all said frames are in compression and remain engaged with the respective socket-like formations by reason of this fact, and outer skin or covering sheets applied to said frames and of such length as to extend from top to bottom of said frames.

Opposed members with two socket-like formations are preferably connected by tension elements or tie-rods which remain in engagement with the said members by reason of the tension to which they are subjected and the frames are preferably clothed with an outer skin or covering of sheet material and an inner lining of insulating material.

The nature of the invention will best be understood from the following description, given by way of example only and illustrated by the accompanying drawings, of suitable ways in which it may be carried into effect as applied to portable steel huts.

In the drawings:

Figure 1 is a perspective view of one form of portable hut type of building constructed in accordance with these improvements.

Figure 2 is a transverse section of the building shown in Figure 1.

Figure 3 is a perspective view illustrating the frames, floor supporting members, roof ties and other parts.

Figure 4 is a part-sectional broken view of a wall with bracing member and part of a floor-supporting member, this figure being to a larger scale than Figures 1 to 3.

Figure 5 is a fragmentary view illustrating a connecting means for roof and wall frames.

Figure 6 is a sectional plan view taken at the lower end of the wall.

Figure 7 is a section on the line Y—Z of Figure 2 but on a larger scale.

Figure 8 is a perspective view of the outer end of a floor supporting member.

Figure 9 is a perspective view of the connecting means for the roof and wall frames.

Figure 10 is a perspective view of a connecting means for the frames at the ridge of a roof.

Figure 11 is a fragmentary transverse sectional view of the roof at the ridge.

Figure 12 is an enlarged section taken along the line W—X of Figure 2.

Figure 13 is a half transverse section of a double-span hut.

Figure 14 is a fragmentary transverse sectional view of the roof of the hut of Figure 13 at the junction of the roof frames shown therein.

Figure 15 is a view similar to Figure 6 but illustrating modifications.

Figure 16 is a fragmentary elevational view illustrating modified connecting means for adjacent floor-supporting members.

Figure 17 is a fragmentary sectional view showing a modified means for securing the lining of the huts.

Figure 18 is a view similar to Figure 11 but illustrating modifications.

Figure 19 is a side view of Figure 18.

Figure 20 is a view similar to Figure 5 but with modifications, and

Figure 21 is a perspective view illustrating a modified hanger and tie rod arrangement for a single span building.

For the construction of a sectional portable building such as is shown in Figure 1, identical frames **1** for the walls and roof (Figure 3), are produced to the most suitable size from top and bottom members **2**, **3** respectively, and a pair of uprights or side members **4**. The top and bottom members **2**, **3** are of sheet steel and similar in shape and as shown clearly in several figures, such as Figures 4 and 5, have the form of a channel or inverted channel with the inner wall **5** elongated in the direction of its height and suitably provided with a lip **6** inturned at right-angles, the outer shorter wall **7** of the channel having a relatively inclined inturned lip **8**. The uprights or the like **4** are sheet steel channels of which the side walls, as also shown in several figures such as Figures 4 and 6, end in inturned flanges **9**. The uprights or side members **4** are secured at their upper and lower ends to the inner faces of the longer walls **5** of the top and bottom members; preferably by cutting away the lip **6** as seen in Figure 6 and welding the inturned flanges **9** of the uprights to the said faces, although clips or the like may be secured on these faces and have the ends of the uprights pushed thereover or thereunder as a sliding fit as will be understood without illus-

tration. The uprights or the like 4, which may terminate just short of the inner faces of the bottoms of the channel members 2, suitably have their outer faces spaced slightly from the inturned lips 8 on the shorter walls 7 of the said members as seen in Figures 4 to 6. The frames 1 may comprise more than two spaced uprights 4 if desired.

The floor 10, see Figures 2 and 7, is composed of rectangular sections of boarding, i. e. planks 11 nailed at each end to battens 12, supported at their ends on transverse sheet metal members 13, see also Figure 3, adapted to rest on the ground or if desired on brickwork on other piers. These members 13 are of channel section with the upper ends of their walls turned outwardly to provide supporting flanges 14. In length, the members 13 are somewhat less than half the width of the floor of the building having the smallest span proposed, that is what may be termed the single span as shown in Figures 1 and 2. At the outer end each member 13 has welded to it, beneath, a horizontal plate 15, see particularly Figures 4 and 8, having a freely projecting portion 16 that is inclined upwardly and provided with an inturned lip 17 at its upper edge. The space between the outer end of the members 13 and the upturned part 16 of the horizontal plate 15 is sufficient to serve as a socket-like formation to accommodate the bottom member 3 of frames 1.

To provide connections between the walls and roof of the building, there are produced elements which, as illustrated particularly in Figures 5 and 9, each comprise a pair of channel-section clips 18, 19 connected by a welded-on vertical gusset plate 20. The two clips each have one long wall and one short wall as shown, and the long wall of the upper clip 19 is also welded at the requisite angle to one corner of the lower clip 18, as at 21. If desired, though not illustrated, the portion of the longer wall of the upper clip which projects beyond the shorter wall of the lower clip may be connected to the latter wall by a triangular gusset plate. The gusset plate 20 extends inwardly of the two clip members and is there formed with an aperture 22 for the engagement of the hooked end of a tie rod 23.

The top members 2 of the frames 1, occurring at the ridge of the roof, may, as shown particularly in Figures 10 and 11, be connected by means in the form of a pair of channel section clips 24 each having a longer wall and a shorter wall and arranged back-to-back with their webs including the desired angle between them. They are connected by a vertical gusset plate 25 having its upper edges welded to the undersides of the longer walls of the clips. A capping member 26 may be provided to engage over the upwardly extending parts of the clips 24 and also to overlap the upper ends of the frames 1 used in the roof. If desired, and as shown, there may further be provided angle members 27 welded to the webs of the clips 24 and spaced by a welded-in gusset 28, these parts strengthening the ridge connection and also assisting in positioning and supporting the capping member 26 which may be "clipped," so to speak, over the heads of such members 27. The gusset plate 25 is formed with three holes 29 arranged at the corners of a triangle disposed with its apex downwards.

The method of erection of the framing elements already described is as follows:

The desired number of pairs of transverse floor-supporting members 13 are laid in parallel relation on the site, as indicated by Figure 3 for instance, the members of each pair being located in alignment, with the horizontal plates 15 at the ends remote from each other and the adjacent ends connected by a short channel-section metal clip 30 (see also Figures 2 and 7), engaged with the respective members 13. Wall frames 1 are now engaged by their lower ends 3 in the spaces or socket-like formations between the upturned outer portions 16 of the horizontal plates 15 and the ends of the members 13 carrying the same and assume a slightly inwardly inclined position. The engagement is brought about by first having the panels outwardly inclined so that the parts 7, 8 of the members 3 of the wall frames can, so to speak, be engaged by a hooking movement, beneath the lips 17 of the portions 16 of the plates 15. For supporting the wall frames in the inclined position, bracing members or struts 31 are provided of similar section to the frame side members or uprights 4. These bracing members, as seen in Figures 2 to 4, may be hinged at 32 to the floor supporting members 13 so that before erection of the building they may be folded down so as to lie within the channel of the floor-supporting members 13. For supporting purposes, such bracing members would be swung to vertical positions, as indicated by the dotted lines in Figure 2, whereupon a plate 33 welded thereto at the top, would be connected by bolt and nut at 34 to the appropriate wall frame upright 4. The bolt and nut would be carried by the upright 4, the nut having a flange 35 to span the inturned flanges 9 of the upright and the threaded end of the bolt being turned over so that the nut and bolt cannot get detached from the upright. This, of course, would necessitate the plate 33 being slotted to one edge at its upper end to receive the bolt. When the wall frames are in position, a suitable number, such as two, of the elements 18, 19, 20 for connecting the walls and roof and of which the clips 18, 19 present socket-like formations, are then engaged over the upper ends of these frames by passing the lower clips 18 thereof over the top members 2 of such panels. Roof frames 1 are then lifted into place to engage their lower ends 3 in the upper clips 19 of the said connecting elements, their upper ends 2 meeting at the ridge of the roof thus produced. To make a secure connection at this point, a suitable number, such as two, of the connecting means 24, 25 referred to above are held in position and the upper ends 2 of two oppositely located roof frames 1 are engaged in the socket-like formations presented by the respective clips 24 thereof. The gusset plates 20 of oppositely disposed connecting elements for the wall and roof frames are connected by a pair of the tie rods 23 which have the hooked end aforesaid engaged in the apertures 22 in the said plates and their other hooked end engaged in similar apertures of a connecting plate 36. A hanger 37 with similarly hooked ends is engaged by one end in the lowermost of the holes 29 in the appropriate gusset plate 25 in the ridge and by its other end with a hole in the connecting plate 36 of the tie rods 23. Adjacent frames 1 may be connected together at the ends of the upper and lower members 2, 3, in any suitable manner, for instance by clips similar to the clips 30 for the floor-supporting members 13 and similarly marked 30

where appearing in the drawings. Preferably clips 30 would be mounted on opposite corners of the frames 1 so that on erection one frame will drop on to the next. On roof frames the clips 30 may be omitted or substituted by a connecting piece which slides tightly across between adjacent upper and lower members 2, 3 of the frames. For the floor, the clips may be attached to one of the adjacent members 13. The clips 30 may suitably be secured to the part they are mated with by captive bolts and nuts. It will be seen that the frames 1 are all in compression and no bolts or the like are required to hold them in engagement with the clips 18, 19 and 24 and the plates 15.

The framework thus produced is clothed externally with sheet steel sections 38 each formed with a number of spaced vertical grooves or corrugations 39 of a cross-section capable of accommodating an upright or side member 4 of a frame 1 as shown by Figure 6. The spacing of the corrugations is suitably one quarter of that of the uprights 4 of which the spacing, when two are used in each frame as described, is suitably half the length of the members 2, 3 of the frames, with each spaced equally from the ends of the upper and lower members 2, 3. The sections 38 are narrower than the frames so that when they are placed over the said frames some of the grooves or corrugations of some sections are engaged over the uprights but some of the sections are only supported by adjacent sections, by inter-engagement of their corrugations. The upper and lower edges of the sections 38 are engaged in the upper and lower members 2, 3 of the frames as shown in Figures 4, 5 and 11, the size or length of the sections being suitably shorter than the distance between the webs of the members 2 and 3 and the sections being conveniently inserted in position by passing them up into the top channel 2 of a framing panel and then letting them down into the bottom channel 3. Due to the front flanges 7 on the outer side of these channels being of unequal depth the sections 38 are retained by both top and bottom channels, and are thus fixed without use of any bolts, clips or rivets. This method of fixing can be used for sections comprising steel sheets, asbestos sheets, or any other type of sheeting. When in position the sections 38 bear on the lips 6 of the members 2 and 3. The upper edges of the sections 38 on the roof are covered by the ridge capping 26. The vertical edges of the sections may furthermore be folded upon themselves to improve the joint between adjacent sections and prevent damage to the said edges due to rough treatment. The bottom, or if desired both the top and bottom, members of the frames 1 are formed with spaced apertures in their webs as at 41, Figures 4, 5 and 6, to provide egress for rain-water. Certain of the frames 1 may be provided with openings between the uprights or side members 4 for the reception of metal frames for windows 43. The window frames may be held in place at the top by fixing into the upper member 2 of a wall or roof frame and at the bottom, the window frame may rest on a second member 42 similar to the member 2 and extending between the uprights 4. Short sheeting 38 would be fitted below the window frame and the window 43 may be hinged at the top so that as shown it can be opened, suitable arrangements being made to ensure weathertightness. If desired the window frames may be welded in position.

It is preferred to line the walls, or walls and roof, of the building with sheet heat-insulating material as at 44. For example insulating board, cut to suitable sizes and provided with a metal surround to each section, may have the surrounds engaged beneath the heads of captive bolts arranged to slide freely up and down the slots between the inturned flanges 9 of the uprights or side members 4 of the frames and corresponding slots of the bracing members 31. A suitable form of such a bolt together with its nut is shown applied to the bracing member 31 at 45 in Figure 12, which also includes channel section strip 46 which may be used for securing the edges of adjacent boards of the lining 44. The nuts at 34, 45 may be square, circular or of elongated form, the latter when turned parallel to the slots between the flanges 9, 9a of the members 4, 31 facilitating adjustment of the bolts along the slots though at their narrowest parts they must be wider than the slots so that the bolts and nuts do not drop out of the slots and get lost.

It is not essential to apply the wall lining to the bracing members 31 as shown in Figure 2, because it may be applied to the wall frames. However, the arrangement shown is advantageous because it provides an insulating air space between the lining and the outer wall of the structure at the lower part of the building.

The end walls 47 of the building are constructed in a similar manner to the side walls, namely of frames clothed externally with sheet steel or other sections similar to the aforesaid sections 38. These frames are of identical sections to the side wall and roof frames but, with the sheet-steel or like sections, are shaped to conform to the pitch of the roof. An end wall may be constructed with three or more frames, one of which may contain a door 48.

The frames 1 may, of course, be employed in the construction of buildings of larger span and this is illustrated by Figure 13 where the building of double the span of that described above would have four frames end to end across the roof. Similarly four floor-supporting members 13 would be necessary to span the floor. Moreover, for joining the upper ends of roof frames erected as already described to the lower ends of the further roof frames which meet each other at the ridge and are there connected as already set forth, additional connecting means would be required and such means suitably comprises a pair of channel-section clips 49, Figure 14, each having a short wall and a long wall, the short wall of the lower clip being welded to the long wall of the upper clip with its free edge about flush with the web of the upper clip. The free portion of the long wall of the upper clip and the web and long wall of the lower clip are connected by a welded-on vertical gusset plate 50 to which is welded in turn the upper end of an angle-iron member 51 extending inwardly and downwardly. The lower end of the said member carries a vertical tie-connecting plate 52 formed with three holes and similar parts would be provided on the other side of the building. The erection of the building is carried out as before, the walls being spaced a greater distance apart of course, but the additional connecting means 49, 50, of which the clips present socket-like formations, are engaged by their lower clips over the upper members 2 of the lower roof frames. The upper roof frames are then engaged by their lover members 3 in the upper clips of the additional connecting means 49, 50 and have their upper ends connected at the ridge as already described. Tie rods

53 having hooked ends are then engaged with the respective holes of the connecting plates 52 carried by the inclined angle-iron members 51 to connect these plates together, to the gusset plates 25 in the ridge and to the gusset plates 20 between walls and roof.

It will be realised from the above description that the invention provides in a very favourable manner for the construction of completely portable single-storey steel buildings such as huts, garages, warehouses, factories and the like. It also provides a method of assembly by which the framework of the buildings and the coverings thereof can be erected without the use of any detachable or "loose" parts such as bolts or nuts or of rivets or pins or site-welded connections. In addition, there is only required a small number of standardised parts which can be so assembled as to give a large number of different lengths and widths of buildings. Each of the frames 1 can be conveniently handled by one man and can be easily stacked or crated and are not liable to get damaged in transport. The buildings can also be completely dismantled and re-erected any number of times, without undue liability to damage of any of the component parts. Moreover, extensions, which are often an expensive undertaking with permanent buildings, can be carried out with very little more expense than that of the extra components required and only take a matter of hours, therefore causing less inconvenience. The sectional gabled ends 47 can also be dismantled and re-erected in relatively simple manner, and the doors and windows and any roof glazing can all be standardised parts.

It will be understood that different standardised sizes of wall and roof frame may be used in any one building. Thus by standardising, say, four lengths of frames and combining these one with another, thirteen different widths of roofs can be obtained. The four sizes of frame give, of course, four standard wall heights. As the walls are sloped, however, each size of wall frame, when used with one width of roof, gives a slightly different total width at the bottoms from any other wall height. Thus, the four sizes of frame will give fifty-two different widths of building, the width being measured at the bottom of the walls. The frames may also be standardised with different widths for example panels which are six, eight and ten feet wide, each suitably with two uprights or side members 4. Thus, the buildings can be extended or altered, not only in length but also in width in numerous ways without waste of existing material. By the provision of a few extra tie rods and clips, a single span building can be made shorter and wider, or a double span building longer and narrower. In the case of double span buildings, extra parts will be required for the end walls but the number of these will be kept low because the end sections of the end walls of a single span building can be similarly used to form half the double span end walls. A further important advantage of the interchangeability of the parts is that it allows a large range of different standard sizes of building to be provided from a comparatively small number of stock parts. Finally, the appearance of the buildings both internally and externally is neat and the buildings may be adapted to provide a considerable improvement in this respect over ordinary corrugated iron buildings.

Various modifications of the construction described are possible without departing from the scope of the invention. Thus according to Figure 15, the sheet steel or like sections 38 may be of ordinary corrugated formation, though in this case the lip 6 of the members 2, 3 of the frames would be deeper than in the case of sections 38 of the nature shown in Figure 6. Figure 15 also shows that the uprights or side members of the frames may have a tapering or splayed form in cross-section. Figure 16 illustrates an alternative connection to the aforesaid clips 30 between adjacent floor-supporting members 13, this connection taking the form of J-shaped parts 54 welded to the members 13 and hooked one into the other as shown. Figure 17 illustrates a wood screw fastening for securing the lining 44 to the members 31 or 4. This form of fastening is suitable for matchboard lining, as well as for lining composed of sheets of wallboard, insulation board or the like, whereas the bolt and strip fastening shown in Figure 12 is only suitable for lining composed of sheets of material. If desired, nails could be used instead of the wood screw fastening. Figures 18 and 19 illustrate an alternative ridge connecting means in which the pairs of parts 24, 27 in Figures 10 and 11 are substituted by single parts 55 which are welded one on either side of a gusset plate 56 which extends longitudinally of the ridge. This gusset plate has elongated holes 57 for the oppositely extending tie-rods 58. Figure 20 shows another form of connecting elements between wall and roof frames 1, one clip part 59 of this connecting means being similar to the clip 19 aforesaid, but the other clip 60 comprising a V-section extension 61 the arms of which are perforated to receive the hooked end of the connecting rod 62, thus dispensing with a gusset plate such as 20 aforesaid. Figure 21 represents a triple rod arrangement for single span roofs as an alternative to the parts 23, 36, 37 in Figures 2 and 3. In this arrangement, two oppositely extending tie rods 63, 64, corresponding to the tie rods 23, 23, in Figures 2 and 3 are extended from a U section part 65, the rod 63 being fixed by a weld 66 at the top of the U, so to speak, and the tie rod 64 being secured by a nut such as 67 which would be adjusted at the works. The hanger rod 68 passes vertically through the U part 65 and may be secured by a nut beneath.

Many other modifications of the construction are also possible and, by way of example, the clips 30 for the floor-supporting members 13 may be in the form of inwardly lipped channels into which such members fit endwise. Moreover, the floor itself instead of being of planks 11 may be of steel sheets or pre-cast concrete slabs. Windows for the roof may occupy the whole length and width between side members 4 and upper and lower members 2, 3 of the roof frames. The bracing members 31 for the walls may be shorter and connected to the wall frames near the middle of the uprights or side members thereof. Also several other alternative systems of tie and hanger rods and struts for the roof may be employed; for instance for a single span building the three rods such as 23, 37, 23 may have their adjacent ends permanently hooked or ringed together and their other ends permanently hooked or ringed to the roof and wall, and ridge, connecting means so as to reduce the number of small "loose" parts.

When the buildings are required to be erected on a concrete floor, the floor supporting members 13 may be dispensed with and only a short

channel footing member of conventional section used extending say from the foot of the bracing member **31** to the bottom of the wall frame, this channel member being secured to the concrete by rag bolts passing through slots in the channel webs and having parts to form, like the plate **15, 16, 17**, a socket-like formation to receive the lower member **3** of the frames **1**.

In any case, the corrugated or like covering sheets **38** may be applied to the frames **1** before erection of the latter if desired. For double span or larger roofs, however, the sheets are preferably fixed after erection of the frames.

What I claim is:

1. A portable building comprising a plurality of skeleton frames capable of use in both walls and roofing structure, a plurality of members at floor or ground level and each having a socket-like formation receiving the lower end of one of said frames erected to form parts of the walls of the building, and a plurality of other members at eaves' level each having two socket-like formations the one receiving the upper end of one of the said erected frames and the other receiving the lower end of one of said frames disposed to form part of the roof of the building, all said frames in the erected building being in compression and remaining engaged with the respective socket-like formations by reason of this fact, and outer skin or covering sheets applied to said frames and of such length as to extend from top to bottom of said frames.

2. A portable building according to claim 1, wherein opposed members with two socket-like formations are connected by tension elements or tie-rods which remain in engagement with the said members by reason of the tension to which they are subjected.

3. A portable building according to claim 1, wherein opposed members with two socket-like formations are connected by a plurality of tension elements or tie-rods which are permanently connected to one another and to said members.

4. A portable building according to claim 1, wherein the skeleton frames are constructed of upper and lower members of channel section joined by two or more uprights or side members also of channel section, the upper members being of inverted channel form and the lower members not being inverted, and these upper and lower members having the channel form constructed to permit the outer skin or covering sheets to be engaged with the frames and retained in position by passing them up into the upper channel members and then letting them down into the lower channel members.

5. A portable building according to claim 1, wherein the skeleton frames are constructed of upper and lower members of channel section joined by two or more uprights or side members also of channel section, the upper members being of inverted channel form and the lower members not being inverted, and these upper and lower members having the flanges on the outer side of the channels of unequal depth to permit the outer skin or covering sheets to be engaged with the frames and retained in position by passing them up into the upper channel members and then letting them down into the lower channel members.

6. A portable building according to claim 1, wherein the walls are inwardly inclined and supported within the building by vertical bracing members secured pivotally to the members having a single socket-like formation.

7. A portable building according to claim 1, wherein the skeleton roof frames are constructed of upper and lower members of channel section joined by two or more uprights or side members also of channel section, and these frames on opposite sides of the ridge of the roof have their upper channel members engaged in members presenting oppositely disposed socket-like formations.

8. A portable building according to claim 1, wherein the end walls also comprise skeleton frames of similar nature to those provided for the walls and roof but shaped to conform with the pitch of the roof.

9. A portable building according to claim 1, wherein the skeleton frames are constructed of upper and lower members of channel section joined by two or more uprights or side members also of channel section, the upper members being of inverted channel form and the lower members not being inverted and both the upper and lower channel members having one wall elongated and having the uprights or side members secured to this elongated wall within the channels.

10. A portable building according to claim 1, wherein the skeleton frames are constructed of upper and lower members of channel section joined by two or more uprights or side members also of channel section, the upper members being of inverted channel form and the lower members not being inverted and both the upper and lower channel members having one wall elongated and having the uprights or side members secured to this elongated wall within the channels, the elongated wall having an inturned lip for the outer skin or covering sheets to rest against.

11. A portable building according to claim 1, wherein tie rods and hanger rods for the roof have hooked ends for engagement with gusset plates at the ridge of the roof and at the junction between the walls and roof.

12. A portable building according to claim 1, wherein floor-supporting or footing members are provided with terminal socket-like formations, for receiving the skeleton wall frames, constructed from horizontal plates or like parts having an upturned outer portion.

13. A portable building according to claim 1, wherein floor-supporting or footing members are provided with terminal socket-like formations, for receiving the skeleton wall frames, constructed from horizontal plates or like parts having an upturned outer portion, and these upturned outer portions have an inturned lip and the lower end of the skeleton wall frames comprises a channel member having an outer wall, with an inturned lip, adapted to be engaged by a hooking movement beneath the first-mentioned lip.

14. A portable building according to claim 1, wherein for connection of adjacent skeleton roof frames for a double span roof, connecting means is provided comprising oppositely directed clips secured to a gusset, the latter having fixed thereto one end of a roof strut carrying at its other end a connecting plate for roof ties.

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