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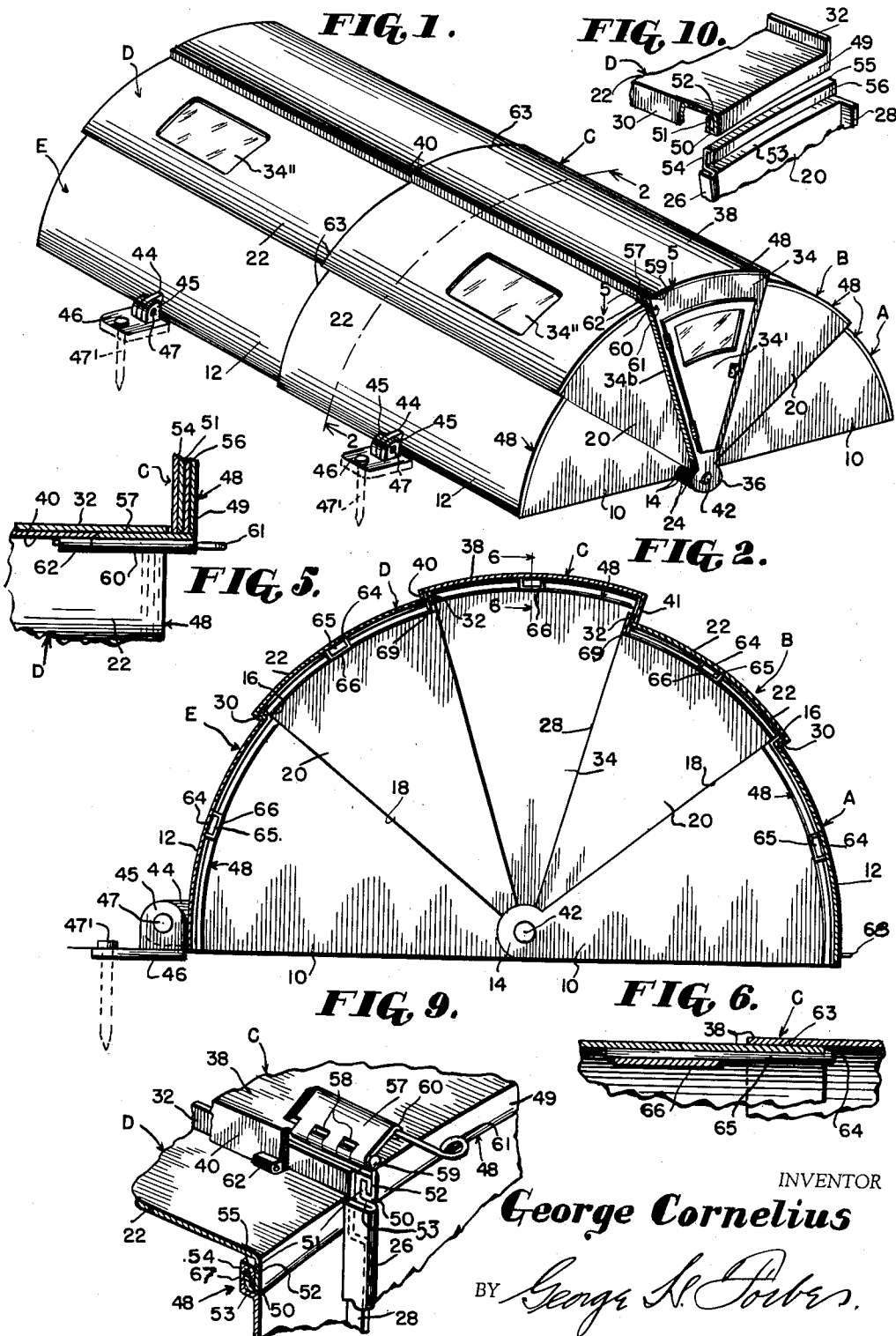
G. CORNELIUS

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FOLDING, COLLAPSIBLE PORTABLE BUILDING

Filed July 24, 1952

2 Sheets-Sheet 1



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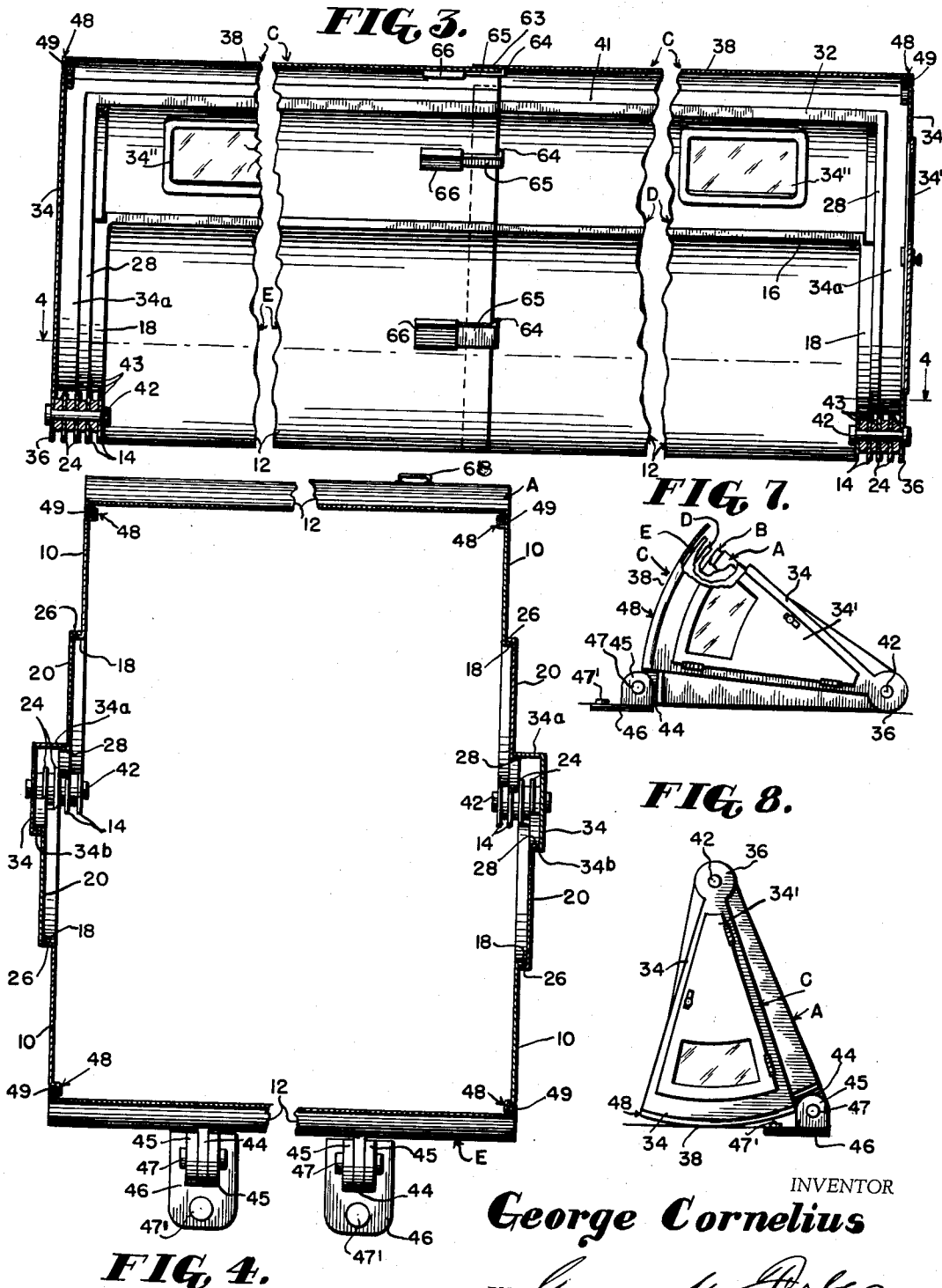
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FOLDING, COLLAPSIBLE PORTABLE BUILDING

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7 Claims. (Cl. 20—2)

This invention relates to improvements in buildings and is directed particularly to an improved folding, collapsible, portable building.

A primary object of the present invention is to provide a convenient, light, folding, collapsible building which can be easily handled and transported when folded.

Another object is to provide a building of the character stated which can be readily folded and shifted in folded condition entirely to one side of the position it occupied before being folded whereby the previously enclosed area may be completely bared or uncovered.

Still another object of the invention is to provide, in a manner as hereinafter set forth, a building made up of a plurality of units joined together by pivot couplings and adapted to be swung on such couplings into a nested condition, or relation, whereby to uncover the area enclosed by the building.

A still further object of the invention is to provide, in a manner as hereinafter set forth, a building of substantially semi-cylindrical form wherein semi-circular opposite end walls are provided which are comprised of sectors of different radii pivotally joined together at their radial centers and a cylindrical longitudinal wall is provided made up of elongate transversely curved members connecting together corresponding sectors of the end walls and forming therewith individual units which are nested one within another when swung in one direction on the pivots connecting the end wall sectors.

A still further object of the invention is to provide a folding, collapsible building of the above described character wherein the building is pivotally secured to the underlying surface, such as the ground or a floor, along the outer longitudinal edge of a bordering unit whereby the entire building, when folded by the nesting of one unit in another, may be swung back on a pivot axis extending along such edge to completely uncover the area previously enclosed by the building.

Yet another object of the invention is to provide, in a manner as hereinafter set forth, a folding building of the above defined character, with novel means of detachably joining, or coupling, the longitudinal members with the end wall sectors whereby the parts can be easily and quickly assembled to form relatively tight weather-proof joints, or disassembled and conveniently stacked together for storage or transport.

Other objects and advantages of the invention will become apparent as the description of the same proceeds and the invention will be best understood from a consideration of the following detailed description taken in connection with the accompanying drawings, with the understanding that changes and modifications may be made in the same so long as such changes do not depart materially from the scope of the appended claims.

In the drawings:

Figure 1 is a view in perspective of a building constructed in accordance with the present invention.

Figure 2 is a transverse section taken substantially in the vertical plane of line 2—2 of Figure 1.

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Figure 3 is a central longitudinal section taken in a vertical plane.

Figure 4 is a transverse section taken in a horizontal plane substantially on the line 4—4 of Figure 3.

Figure 5 is a detail section taken substantially on the line 5—5 of Figure 1.

Figure 6 is a detail section taken substantially on the line 6—6 of Figure 2.

Figure 7 is a view of one end of the building with the units in folded or nested relation, parts being broken away.

Figure 8 is a view of the structure folded as in Figure 7 but swung over on the side hinges.

Figure 9 is a fragmentary view in perspective showing position.

Figure 10 is an illustration in perspective of the separated elements of the sliding joint connection between an end wall sector and the longitudinal elongate transversely the joint cover at one side of the middle unit, in open curved panel joined thereto.

Referring now more particularly to the drawings it will be seen upon reference to Figures 1 and 2, that the building of the present invention is of generally semi-cylindrical form and is made up of a plurality of units, here shown as five, which are pivotally coupled to be turned on a common longitudinal axis, and are of graduated radii to be nested together, when so turned, to the form, or condition illustrated in Figure 7.

While the several units are of the same general form, there are detail differences between them which require that they be individually identified and described.

Accordingly the reference characters A, B, C, D, and E designate respectively: the front, or first, unit; the second unit; the third, or middle, unit; the fourth unit; and the fifth, or back unit.

The units A and E are identified as the front and back units, because of the fact that in folding or collapsing the building the operation is started with unit A and the units folded back toward unit E, which is hinged to the ground, or an underlying floor, so that the entire structure may be swung over from the position shown in Figure 7, to the position shown in Figure 8.

The front and back units A and E are each comprised of the two end wall sectors 10 and the longitudinal, connecting roof or wall section 12. Each sector 10 at its center is formed as a circular, centrally apertured hinge ear 14, to which one radial edge of the sector is tangent so that such edges may lie flat on the floor or ground when the building is set up for use, as shown in Figure 2.

The top longitudinal edge of each section has therealong the radial, outwardly directed flange 16 and the top radial edge of each sector has extending therealong, the longitudinally directed outward, side flange 18. See Figure 4.

The units B and D are also substantially of the same form, or construction, as units A and E, except for the radius of the sectors.

Each of the units B and D is comprised of the two end wall sectors 20 and the connecting longitudinal roof section 22.

Each sector 20 has a centrally apertured hinge ear 24, at its center, which is concentric with the ears 14.

Extending along the lower radial edge of each sector 20 is the longitudinally inwardly directed side flange 26, while the opposite, or upper, radial edge has therealong the longitudinally outwardly directed side flange 28.

The flanges 26 abut against the outer faces of the flanges 18, when the units are drawn out, as shown in Figure 4, while the flanges 28 abut against the flanges of the middle unit sectors about to be described.

In addition to the sector flanges 26 and 28, the longitudinal top sections have along each lower longitudinal edge, the intumed flange 30, which, as shown in Figure

2, abuts, or opposes, the outer face of the flange 16, and has its edge in close proximity to the outer side of the section 12, while the upper longitudinal edge of each section 22 has therealong the radial outwardly turned flange 32.

The middle unit C is comprised of the two end wall sectors 34, each of which has the centrally apertured hinge ear 36 at its center.

The radial edges of each center unit sector have extending therealong the inturned flanges 34a and 34b, the first of which is of greater width than the second, as shown in Figure 4. Also, as shown in this figure, the adjacent outturned flanges 28 engage the inner faces of these flanges.

Joined to the outer edges of the sectors 34, and connecting them together, is the longitudinal roof section 38.

Extending along one longitudinal edge of the roof section 38 is the downturned flange 40 and the opposite longitudinal edge of the section has a corresponding downturned, but wider, flange 41.

As shown in Figure 2, the flanges 40 and 41, overlap and position against the outer faces of the outwardly directed flanges 32 of the intermediate units B and D, when the building is unfolded or set up for use.

The apertured, adjacent ears 14, 24 and 36, of the end wall sectors, are pivotally coupled together by suitable pivot pins or bolts 42, as shown in Figure 3, with suitable spacer washers 43 thereon and between the coupled ears to keep the sectors in parallel relation.

It will be readily apparent upon reference to Figures 1 and 2, that the end wall sectors are of different radii, whereby unit A may be swung into unit B, and these two then swung into the center unit C. The three units can then be swung over together so that, unit D swings down over unit E, with unit C covering D and E, and units A and B going inside of E. Thus the folded structure will assume the form shown in Figure 7.

As illustrated, the bottom edge of unit E is pivotally secured to the ground, or an underlying floor, so that the entire structure may be swung on a longitudinal axis to the position shown in Figure 8, thereby completely removing the building from over the area it covers when unfolded, or set up, for use.

Any suitable means may be employed for pivoting the back unit, the means here illustrated comprising the two apertured hinge ears 44 carried by the wall 12 and positioned each between two apertured, fixed ears 45 carried by a plate 46, with a pivot pin 47 passing through the adjacent ears 44, as shown. The plate is fixed down in any suitable manner, as by a ground stake 47', or the like, passing through the plate.

For entry into, and exit from, the building one or both of the sectors 34 may be provided with a door 34', and windows 34'' may be provided in one or more of the longitudinal sections, as shown.

In the structure as thus far described the units may be separated by removal of the pivot bolts 42. However, for storing and transportation purposes it is desirable that the longitudinal sections be removed from connection with their end wall sectors and to that end the sliding flange joints, illustrated particularly in Figures 9 and 10, and generally designated 48, are provided.

The joints 48 will be described by reference to parts of units C and D, but it will be readily apparent that corresponding parts of the other units will be similarly designed for collapsing so that each end wall sector may be slidably disconnected from, or connected to, the adjacent end of its longitudinal section.

As illustrated in the figures stated, the end of the longitudinal section has a downturned band 49, which joins an inturned flange 50, which merges at its inner edge in the upturned lip 51. The lip 51 is spaced at its top edge from the overlying longitudinal section and forms with the band the transversely extending slot 52.

The wall of the sector lies in the plane of the downturned band 49, and at its top edge the sector wall has the inturned transverse flange 53, which butts against the underface of the flange 50. Extending upon and from the inner edge of the flange 53 is the band 54 which lies against the inner side of the lip 51, and is joined across the edge of the lip 51 by the transverse portions 55, with the downturned lip 56 which lies in the channel 52.

The inturned and outturned flanges 26 and 28 respectively, terminate at their upper ends at the line of the inturned transverse flange 53. Thus when the two interengaged parts of a joint are to be separated to separate the sectors from the top section, the sector side flanges will not interfere. Separation of the sectors of any of the units A, B, D and E from their respective longitudinal sections is effected by sliding the sector part of the joint across the edge of the longitudinal section from which the flange 16 or 32 projects, since the opposite, or inturned flange 30, covers the ends of the joint parts.

In the middle unit C, however, since both flanges 40 and 41 project inwardly, a portion of one flange at each end, here shown as flange 40, is cut away to provide a door 57. An edge of this door and the adjacent edge of the section 38 are provided with the interengaging hinge knuckles 58 which are pivotally joined by a pintle pin 59.

The free long edge of the door has fixed therealong a sleeve 60 to receive a securing pin 61, the inner end of which engages in a keeper 62, formed on the adjacent portion of the flange 40, as shown in Figure 9. Thus by opening the door 57 the parts of the adjacent joint can be readily slid apart, or together, and when the door 57 is closed a weather-tight construction is obtained.

In order to provide for the convenient handling of the parts in a building of any considerable length, the longitudinal sections may be divided into two or more parts, as shown, and made of the proper dimensions to enable one to be slid into the other into a slightly overlapped relation, as indicated at 63 in Figures 3 and 6.

For the effective locking together of the parts at the joint 63 one part has secured to the inner face, as at 64, an end of a relatively long tongue 65, which is spaced from said face, outwardly from the place where it is attached, so as to receive snugly the edge of the other part of the section, and the free end of the tongue is received in a guide loop 66, secured to said other part as shown.

While only one joint locking tongue 65 has been shown for each longitudinal section, it is understood that more may be employed if desirable.

From the foregoing it will be seen that there is provided a novel building construction which can be readily opened up for its full length when it may be desired to introduce therein structures or material too large to pass through the door 34', or the entire building may be shifted to one side of the back unit E, in the manner illustrated in Figure 8, so as to completely uncover the area enclosed by the building so that long structures can be placed lengthwise in the building, or may be introduced into the area from one end, if conditions prohibit introduction of such structures from the front.

It will also be readily seen that the several parts of the building may be easily separated from one another to permit packing and transportation.

In order to prevent relative shifting of the connected parts of the slide joints 48, such parts may be locked together by screws 67 threaded transversely through the parts from the inside as shown in Figure 9.

The front unit A is provided with suitable handles 68 to facilitate folding the structure and such handles by engaging the adjacent flange 30 of unit B prevent the unit A from swinging in past unit B, or a number of stops 69 may be placed at the top or inner longitudinal edge of the section 22, for the purpose of limiting the inward swinging of unit A. Likewise, stops 69 may be located at the top or inner longitudinal edge of section 22 of unit D, for limiting the swinging of unit D into unit E.

I claim:

1. A folding building of substantially semi-cylindrical form comprised of a multiplicity of elongate units, each of said units including two end wall sectors and a longitudinal roof section connecting the arcuate edges of the sectors, the adjacent end wall sectors having a common radial center, aligned pivot pins coupling the sectors of the end walls on said common centers, said units all being movable relative to one another about said pivots and adapted to be nested between the sectors of one unit, and means for pivotally securing the longitudinal edge of a bordering one of the units to turn on an axis extending longitudinally of the building parallel to the axis of said pivot pins, the said units when nested being turnable about said axis to a fully inverted position outside of the area covered by the set-up building.

2. A folding building, comprising an elongate substantially semi-circular structure having semi-circular end walls and an arcuate roof wall, each end wall comprising a center sector of maximum radius and lateral sectors of lesser and differing radii, said roof wall comprising a central longitudinal section connected at its ends to and between the curved edges of the center sectors and lateral longitudinal sections connected at their ends to and between the curved edges of the lateral sectors, pivot pins coupling together the sectors of each end wall at the radial centers thereof, an inturned flange extending along each radial edge of said center sector, an inturned flange extending along each longitudinal edge of said central longitudinal section, an out-turned flange extending along one radial edge of each lateral sector adjacent to a central sector and along one longitudinal edge of the longitudinal section nearest to the central section, said out-turned flanges being adapted to overlap and engage said inturned flanges, overlapping and engaging inturned and out-turned flanges carried by adjacent edges of the remaining sectors and longitudinal sections, and means connected with the bottom longitudinal edge of an outermost one of the longitudinal sections for securing the latter to an underlying surface.

3. The invention as set forth in claim 2, wherein said means is in the form of a hinge having its turning axis parallel to the axis of said pivot pins.

4. The invention as set forth in claim 2, in combination with means forming an interlocking sliding connection between the said curved edges of the center sectors and the adjacent ends of the longitudinal section whereby the center sectors and the center section are detachably coupled together, and one of the said inturned flanges of the center longitudinal section having a portion of each end movable to provide an opening in the flange to facilitate separation and engagement of the interlocking connection between the center sectors and the center section.

5. A folding building of semi-cylindrical cross sectional form comprising a multiplicity of longitudinal units

each including two end wall sectors and a longitudinal transversely curved roof section connecting the arcuate edges of the sectors, one unit being centrally located with other units at opposite sides thereof, all of the sectors for each end wall having a common radial center, pivot means coupling the sectors for each end wall for turning on said common center, the end wall sectors of said central unit lying outside the planes of all of the other adjacent wall sectors, said other sectors of each end wall and the roof sections joined thereto being constructed and arranged to be turned on their pivot means and nested within the central unit, and means for effecting weather-tight joints between the units in the unfolded building.

6. A folding building of semi-cylindrical cross sectional form comprising a multiplicity of longitudinal units each including two end wall sectors and a longitudinal transversely curved roof section connecting the arcuate edges of the sectors, one unit being centrally located with other units at opposite sides thereof, all of the sectors for each end wall having a common radial center, pivot means coupling the sectors for each end wall for turning on said common center, the end wall sectors of said central unit lying outside the planes of all of the other adjacent wall sectors, the units lying to one side of the central unit being constructed and arranged to be turned on the pivot means into nested relation with one another and into the central unit and the units lying upon the other side of the central unit also being constructed and arranged to be turned on the pivot means into nested relation with one another and into the central unit and the previously nested units whereby all of the units at both sides of the central unit are enclosed in the central unit, and means for effecting weather-tight joints between the units in the unfolded building.

7. The invention according to claim 6, with means for securing a bordering one of the units to an underlying base whereby the central unit and all of the other units when nested and enclosed therein may be turned about an axis paralleling the pivot means to fully uncover the area covered by the unfolded building.

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