

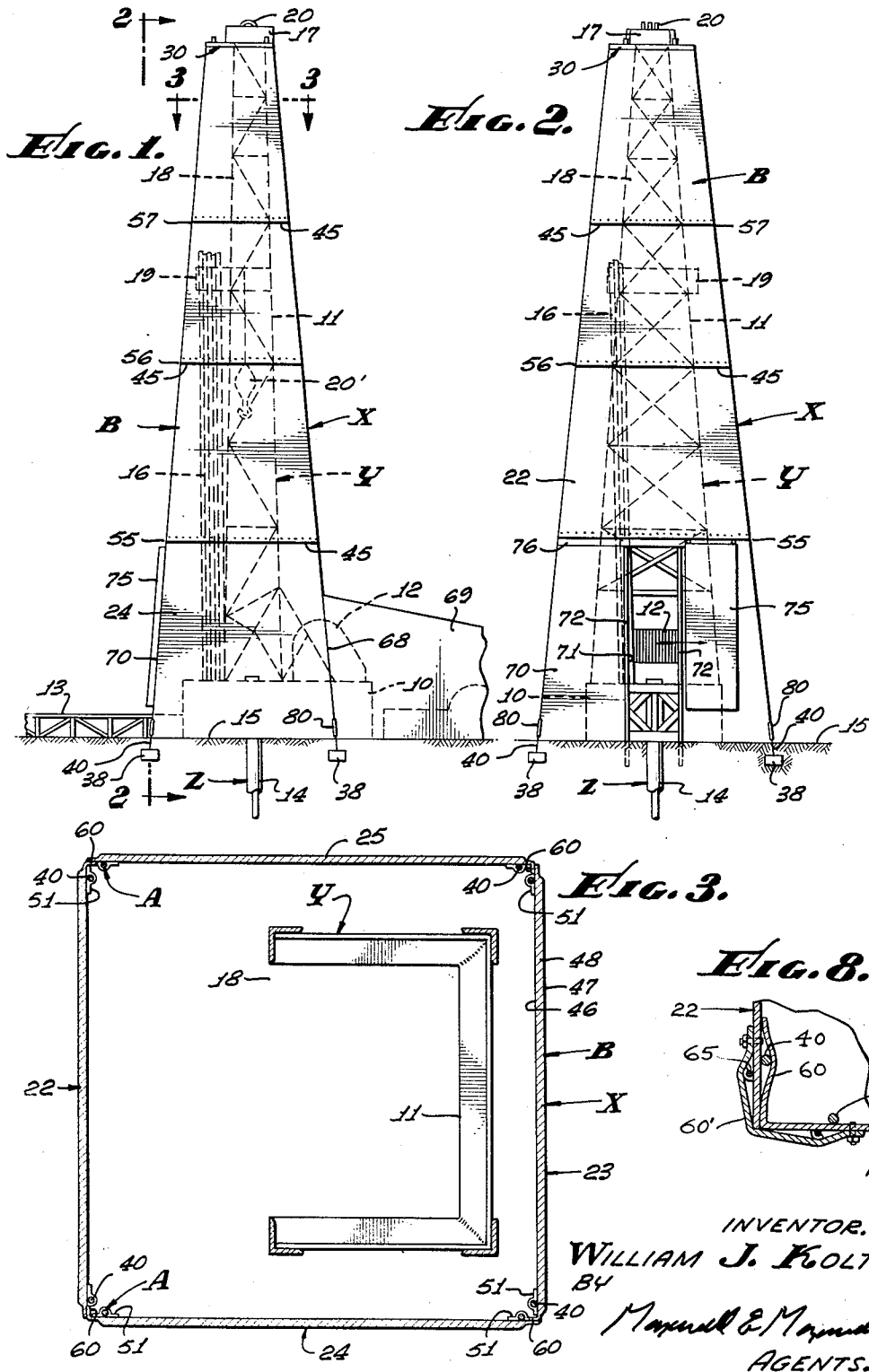
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W. J. KOLT
WELL RIG COVER

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2 Sheets-Sheet 1



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2 Sheets-Sheet 2

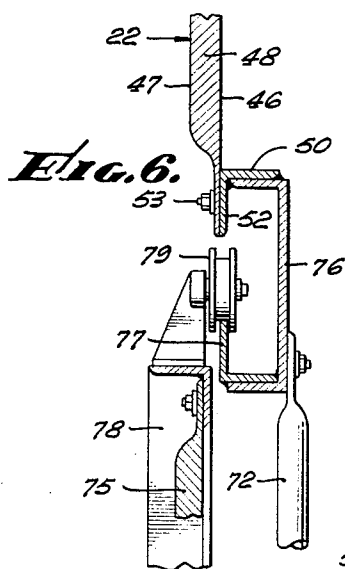
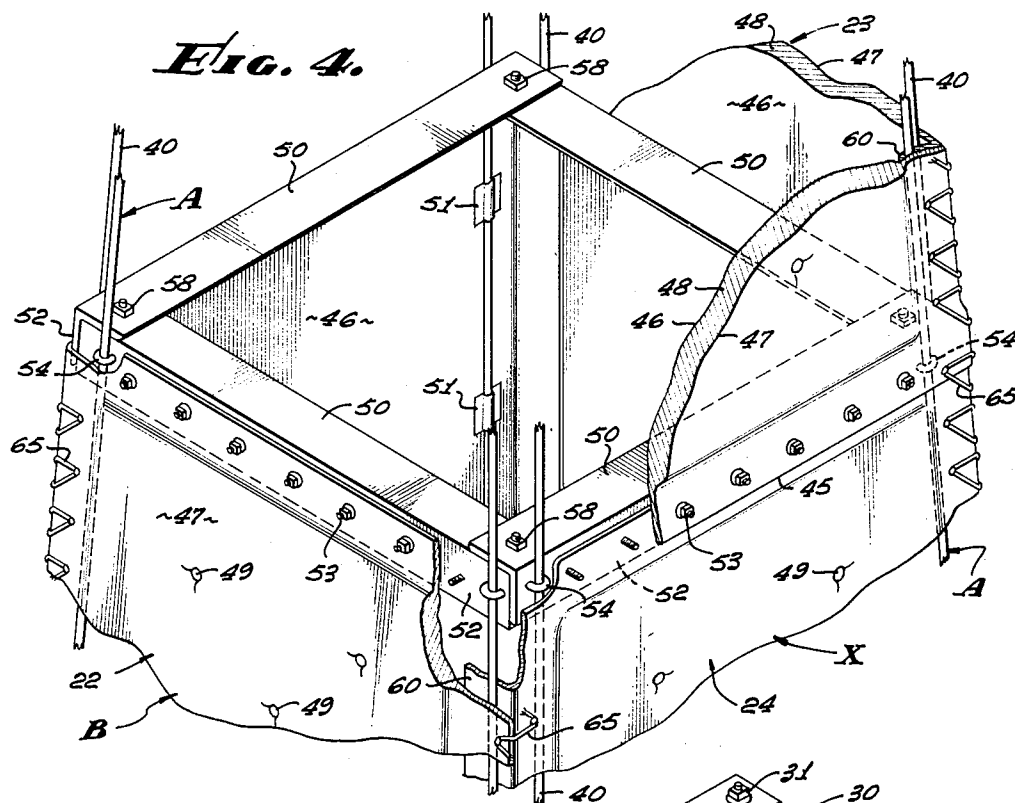


Fig. 5.

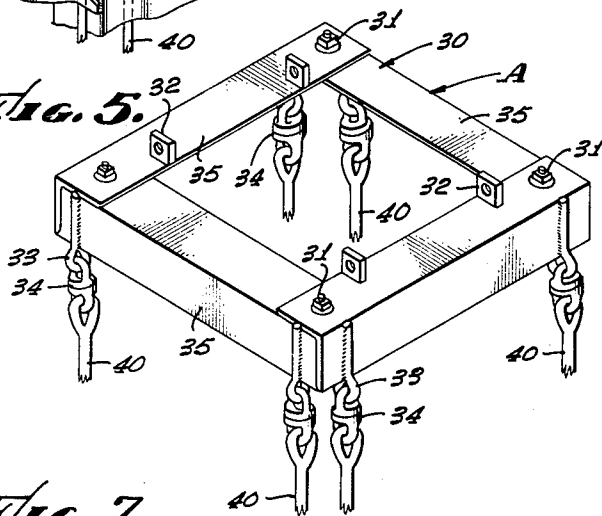
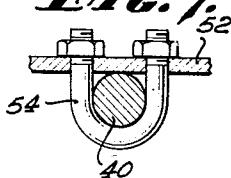


Fig. 7.



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WELL RIG COVER

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4 Claims. (Cl. 189—16)

This invention relates to a well rig cover and is primarily concerned with a closure for a derrick, particularly with a closure for a portable rig or derrick, it being a general object of this invention to provide a practical means for enclosing such a derrick to keep out the wind and weather and to improve acoustics by preventing the escape of noise.

Closures have been provided in connection with permanent derrick structures but not in connection with portable drilling rigs or derricks. In many cases, enclosed rigs are required for various reasons, and ordinarily this would indicate or require the construction of a permanent derrick. Permanent derricks are becoming a thing of the past and are being replaced by the more versatile portable rigs, however, there is no structure on a portable rig which would lend itself to the support of a closure and consequently such rigs are not ordinarily enclosable.

An object of this invention is to provide a closure and a support therefor for installation over or around a portable drilling rig or mast. The portable rigs vary widely in form and construction, some of them being a single mast structure, and some of them being a double mast structure, etc. In any case, they are usually tall and slender, the work or drilling operation taking place at or along one side thereof. The closure that I have provided envelops the entire mast or rig and the drilling or other operations in connection therewith.

Another object of this invention is to provide a closure support that is adapted to be installed on a slender vertically disposed derrick or rig and which is independent of the derrick and is adapted to carry a cover or walls that envelop or enclose the derrick.

It is still another object of this invention to provide a cover or closure that is easily and quickly installed on the support above referred to and which is flexible and efficient in insulating the derrick or rig acoustically as well as thermally.

Still another object of this invention is to provide a shiftable access door for the closure above referred to, which door is adapted to be carried by the closure support that I have provided.

A further object of this invention is to provide a relatively simple and inexpensive closure and support therefor adapted to envelop a portable derrick or the like and which is easily and quickly assembled or disassembled without affecting the derrick structure or the operation of the derrick or the drilling rig.

The various objects and features of my invention will be fully understood from the following detailed description of a typical preferred form and application of my invention, throughout which description reference is made to the accompanying drawings, in which:

Fig. 1 is a side elevation of a typical derrick or mast with the cover installed thereon as provided by the present invention. Fig. 2 is a front view of the derrick shown in Fig. 1, being a view taken as indicated by line 2—2 on Fig. 1. Fig. 3 is an enlarged transverse sectional view taken as indicated by line 3—3 on Fig. 1. Fig. 4 is an

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enlarged detailed perspective view with portions of the structure broken away and showing the manner in which the various parts of the structure are assembled and secured together. Fig. 5 is a perspective view of the element that I have provided for securing the closure of the present invention to the head portion of the mast or derrick. Figure 6 is an enlarged sectional view through the upper portion of the door, with the door closed. Fig. 7 is an enlarged detailed view of a portion of the structure illustrating the manner in which the cables are clamped in place, and Fig. 8 is a sectional view taken at one corner of the structure and having a modified form of construction.

The well rig cover X of the present invention is applicable to a rig or derrick Y and is adapted to enclose the workings and activities that surround the operation of a well Z. That is, the cover X envelops the rig Y and stands over the well Z in order to house a well servicing or drilling operation, or the like. The rig Y is located over the well Z and is erected to project upwardly and substantially vertically from the well and may include a base 10, a mast 11, a draw works 12, pipe racks 13 and various other equipment such as engines and pumps, etc., as circumstances require. The well Z extends vertically into the earth and includes a surface casing 14 that terminates at or above the ground level 15.

The base 10 of the rig Y is a horizontally disposed framework that has a flat top or floor providing a working platform and adapted to support equipment, such as stands or drill pipe 16, etc.

The mast 11 may vary widely in form and construction and may be a simple single mast as shown in Figs. 1 and 2 of the drawings. The mast 11 is vertically disposed and projects upwardly from the base 10 to terminate at a head or water table 17. The particular type of mast 11 shown in the drawings is substantially U-shaped (see Fig. 3) in cross section and is open at the forward side 18 thereof throughout its height. A pipe racking platform 19 is provided at or near the central portion of the mast 11 and is a horizontally disposed platform that projects from the side 18 of the mast and is adapted to support the upper end of the stands of pipe 16. With the forward side 18 of the mast 11 open and with the platform 19, it will be understood how the stands of pipe 16 can be erected on the floor of the base 10 to lie or rest against the mast 11 at or adjacent the well Z. Further, the mast 11 includes a crown block 20 that is supported or carried by the water table 17 at the top of the mast 11, and a traveling block 20'.

The rig closure X that I have provided may be supported by or carried over any rig or mast 11 and is considerably larger in cross section than the mast in order to provide ample work room or space. In accordance with the invention, the closure X is a flexible structure that can be easily and quickly assembled in working position over or around the mast 11 and involves, generally, a support A and a shell B. The support A and shell B may be applied to the mast simultaneously if so desired or separately, as circumstances require, and are carried by the mast 11 to surround it and to house the entire drilling or work operation. The support A is in the nature of a frame-work and is secured to the mast 11 and as well, is anchored to the base of the rig Y or to the ground level. The shell B is in the nature of an envelope and is carried by the support A to surround the rig with substantial clearance and to enclose the work being performed on the well Z.

The support A involves, generally, a header 30 and a plurality of stays 40. The header 30 is carried at or near the head of the mast 11 while the stays 40 are carried by and depend from the header 30 and are anchored at the base of the mast 11. As shown, the closure X

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is polygonal in cross section and may be substantially square, in which case there are four sides 22, 23, 24, and 25, preferably of substantially equal size and shape. The front and back sides 22 and 23, respectively may be provided with doors or end openings in order to pass equipment or to accommodate machinery, as hereinafter described. Further, the sides 24 and 25, likewise, can be provided with suitable access openings as required. It is to be understood that the closure X may be of any suitable cross section as circumstances require, and in the preferred form, is pyramidal in form. That is, the closure X tapers outwardly or widens outwardly and downwardly toward the base portion thereof. This pyramidal shape is in conformance with general practice and provides greater working space at the floor of the rig Y.

The header 30 that I have provided is the main supporting element of the structure of the present invention and is adapted to be carried and supported at or near the upper end portion or head of the mast 11. It is preferred to position the header 30 adjacent the water table 17 or to hang or to suspend the header 30 from the water table 17. As shown in Fig. 5 of the drawings, the header 30 is a square or rectangular frame-like element secured together as by bolts or like fasteners 31 so that it can be assembled over or around the mast 11. The header 30 is provided with supporting lugs 32 that may be bolted to or welded to suitable structure of the water table 17 so that the header 30 is rigidly carried in a horizontal plane. It is preferred that the header 30 be mounted so as to project from the sides of the mast 11 and a substantial distance forwardly from the forward side 18 of the mast 11 in order that the side 22 depends clear of the mast and to provide working clearance around the mast 11.

The stays 40 that I have provided are preferably in the form of flexible steel cables, or the like, though they may be made up of sectional rods or like structural elements if so desired. There may be one or more such stays at each side of the closure X and such stays may be simply located at the corners of the closure as shown. In the preferred form of the invention, the sides 22, 23, 24, and 25 are made up as units, in which case the stays 40 may be considered as part of the sides. In any case, the stays 40, as shown, depend downwardly from the corner portions of the header 30 and are somewhat divergent and are anchored to the base 10 or to the ground at or near the base of the rig Y. In the case illustrated, eyebolts 33, or the like, are secured to the header 30 as by welding and the stays 40 are releasably fastened to the bolts 33 through suitable cable connections 34. Each side member 35 of the header 30 is shown carrying a pair of spaced bolts 33, one at each end thereof so that they occur at the corners of the header 30. Thus, two eyebolts 33 are provided, one at each side of the corners of the header 30.

In accordance with the invention, anchors 38 are provided to secure the lower ends of the stays. When the closure X is square or rectangular, as shown, there are four anchors 38 suitably positioned in a widened pattern and adapted to hold the stays 40 under suitable tension. The anchors 38 may be fastened to the base 10, providing the base 10 is of suitable size and proportions, or as shown, the anchors may be in the form of deadmen buried in the earth surrounding the rig Y. In any case, when there are two stays 40 at each corner of the closure X, each anchor 38 is provided with means for securing or holding the lower ends of the stays 40, preferably for holding each other individually.

The shell B that I have provided is in the form of an envelope, and in the case illustrated, involves the four like sides, 22, 23, 24, and 25. The sides are preferably sectional in order to facilitate manufacturing and handling. The sections are joined together along horizontal lines 45 that extend transversely of the sides. The sides 22, 23, 24, and 25 may be formed of any suitable sheet material such as metal or plywood, and are preferably

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of fabric such as canvas or the like. As shown, there is an inner layer of fabric 46 and an outer layer of fabric 47 that are spaced apart, there being an intermediate layer of filling 48 in the form of insulating material.

The filling 48 may be any suitable insulating material and of any desired thickness to meet varying conditions and acts to prevent heat transfer through the walls of the structure formed by the sections thereof. In order to hold the filling 48 in place and to prevent shifting thereof, the sides 22, 23, 24, and 25 and/or the sections thereof may be quilted by seams of sewing or tufted, as indicated at 49.

The sides 22, 23, 24, and 25 are alike, and in the preferred form of the invention, each involves a pair of stays 40 and spaced formers 50 that extend between the stays 40 to space them and to hold the sides in place. The stays 40 extend along the marginal portions of the sides 22, 23, 24, and 25, and are secured thereto by means of loops 51 sewed to the inner layer of fabric 46. The loops 51 are provided at suitable intervals depending upon the amount of support needed, and may even be continuous.

The formers 50 are rigid bar-like members preferably angular in cross section and are shown as being horizontally disposed to extend from one side of the side to the other. Each former 50 has a depending flange 52 to which the side sections are secured as by fasteners 53. In practice, a series of fasteners 53 is provided along the former 50 in the form of studs that project outwardly from the flange 52. The sections of the side may be lapped as shown and engaged on the series of studs after which washers and nuts may be applied to secure the parts together. It will be apparent how the sections of sides are joined together, one to the other, and how the formers 50 are fixed in position. Further, a U-bolt or cable clamp 54 is carried at each end of the former 50 to hold the stays 40 in proper working position relative to the former and to the side engaged therewith.

It will be observed that the sections of the sides 22, 23, 24, and 25 are joined at like intervals or at the same levels 55, 56, and 57 so that the formers 50 come together at the corner portions of the closure X. In order to increase rigidity of the closure X, the formers 50 are fastened together at their ends or at the corners of the structure by means of screw fasteners 58, as shown.

In order to seal the closure X at the corners thereof, I have provided a flap 60 on each side 22, 23, 24, and 25. The flaps 60 project laterally from the sides along the marginal portions thereof, for example, from the left-hand marginal portions thereof. Since wind and air pressures tend to shift the sides relative to each other, I provide means 65 for joining the corners of the closure X. The means 65 may be any suitable means and is shown in the form of lacing that may be threaded back and forth between the adjacent sides. Thus, the flaps 60 are held in tight overlapping engagement with the adjacent side that it engages. As shown in Fig. 8 of the drawings, an additional outside flap 60' may be provided that is secured to one side and overlies the lacing and is pinned to the adjacent other side.

The lower section 68 of the back side 23 may be opened to an engine house 69 while the lower section 70 of the front side 22 may be provided with a door opening 71. The opening 71 is defined by spaced parallel vertically disposed columns 72 to which the panels that form the sections 70 are secured. The top ends of the columns 70 are secured to a former 50 (see Figs. 2 and 6), and the lower ends of the columns 72 may be secured to the base 10 of the rig, or as shown in the drawings, may be imbedded in postholes.

A door 75 is provided to close the opening 71 and is a shiftable door adapted to move laterally of the side 22 to open or close the opening 71. As shown, a hanger 76 depends from the former 50 at the side 22 and at the top of the opening 71 and a track member 77 is supported

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by the hanger 76. The door 75 is a rectangular part preferably of the same construction as the sides and has a frame 78 provided with rollers at the upper end thereof or casters 79 that engage with and suspend the door 75 from the track 77.

From the foregoing, it will be apparent that I have provided an extremely simple cover for a derrick rig or mast that is easily and quickly installed in working position. In order to erect the cover of the present invention, the header 30 is first applied to or connected with the upper end portion of the mast 11, preferably attached to the water table 17, and the anchors 38 are properly located or positioned as shown, and are preferably in the form of dead men buried as above described. Each individual side, 22, 23, 24, and 25 is then hoisted or lifted into position, the upper ends of the stays 40 being attached to the eyebolts 33 on the header 30 and joined thereto by the connection 34, and the lower ends of the stays are secured to the anchors 38. Turnbuckles, or the like, may be provided at 80, preferably at the anchors 38 and connected with the stays 40 in order to apply the desired tension on the stays 40 in order to keep them taut and straight. With the panel sections and the formers joined to the stays 40 and forming integral side units, each side is thus installed with a minimum of effort, and when the stays are properly fastened, the side is in the proper working position. When the sides are installed, the lacing may then be applied to join the sides at the corners of the cover and the formers may be secured together at the corners of the cover by the fasteners 58. As the front side is lifted into place, the columns 72 at the opening 71 may be imbedded in suitable postholes, or the like, and after the side 22 is erected and secured in working position, the door 75 may be applied to the track 77 whereupon the closure X that I have provided is complete. The stands of pipe 16 may be entered into the closure through the opening 71 which is of substantial height.

Having described only a typical preferred form and application of my invention, I do not wish to be limited or restricted to the specific details herein set forth, but wish to reserve to myself any variations or modifications that may appear to those skilled in the art and fall within the scope of the following claims:

Having described my invention, I claim:

1. In a cover enclosing a well rig mast projecting centrally thereof, an upper header supported by said mast adjacent the top thereof, a plurality of stays having their upper ends secured to said header, means anchoring the stays under tension at substantially ground level, a plural-

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ity of vertically spaced formers carried by and extending transversely between said stays, and side sheets secured to said stays and said formers, the side sheets cooperably forming an envelope enclosing said mast throughout substantially its entire height.

2. A cover enclosing a well rig mast projecting substantially centrally thereof comprising a rectangular upper header, means supporting said header upon the mast, a plurality of cable stays secured at one end to said header and extending downwardly and outwardly and anchored under tension at substantially ground level, a plurality of horizontally disposed rectangular formers secured to said stays in vertically spaced relation, the circumference of the formers increasing progressively from the header toward ground level, a plurality of individual cover sheets of trapezoidal shape, each of said sheets extending between vertically adjacent formers and laterally aligned stays, respectively, and means securing each of said cover sheets to the corresponding adjacent stays and formers.

3. A cover enclosing a well rig mast projecting substantially centrally thereof comprising a rectangular upper header, means supporting said header upon the mast, a plurality of cable stays secured at one end to said header and extending downwardly and outwardly and anchored under tension at substantially ground level, a plurality of horizontally disposed rectangular formers secured to said stays in vertically spaced relation, the circumference of the formers increasing progressively from the header toward ground level, a plurality of individual cover sheets of trapezoidal shape, each of said sheets extending between vertically adjacent formers and laterally aligned stays, respectively, and means securing each of said cover sheets to the corresponding adjacent stays and formers, said cover sheets each having a marginal flap formed integrally therewith and deflected to lie substantially normal to the plane of said sheet for extended surface contact with the next adjacent sheet, and means threadedly engaging each of said adjacent sheets to additionally secure said sheets to one another.

4. In a cover as defined in claim 3, means defining a door opening in one of said sheets, a hanger carried by one of said formers and overlying said opening, and a door panel carried by said hanger to depend therefrom for closing said door opening.

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