June 9, 1959 J. G. DE FLON 2,889,584

COOLING TOWER WALL ASSEMBLY

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FIG. 1.

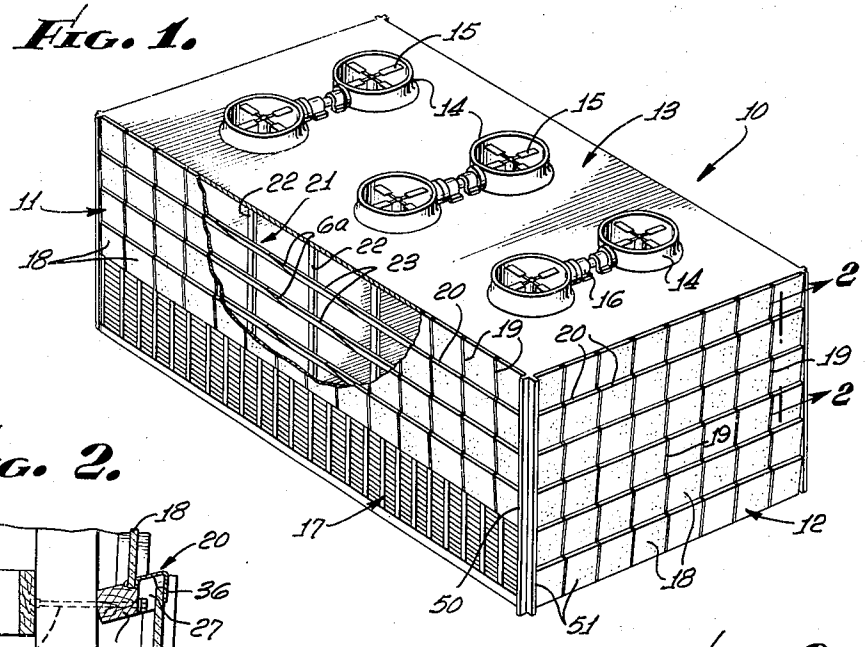


FIG. 2.

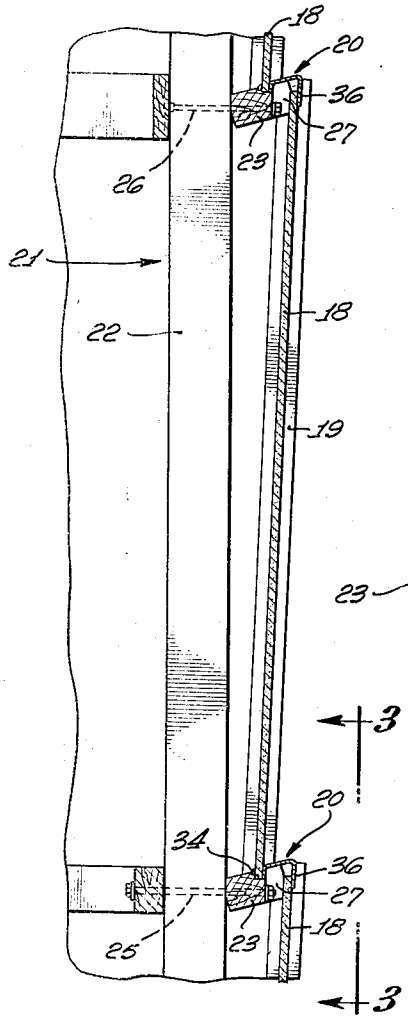
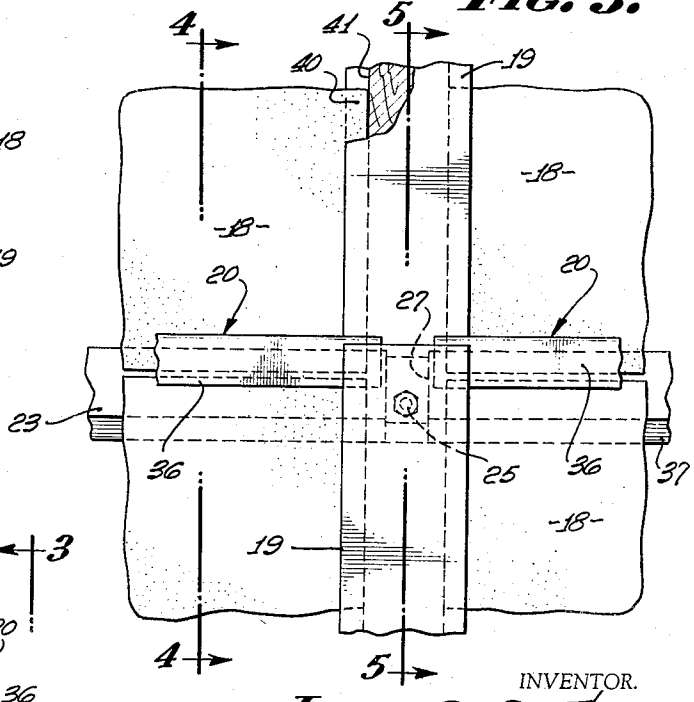


FIG. 3.



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FIG. 4.

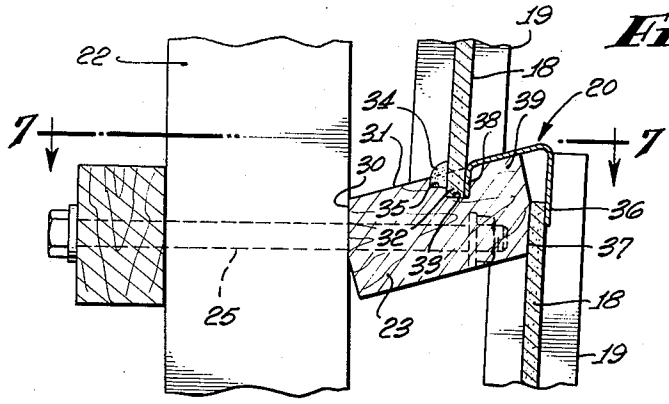


FIG. 5.

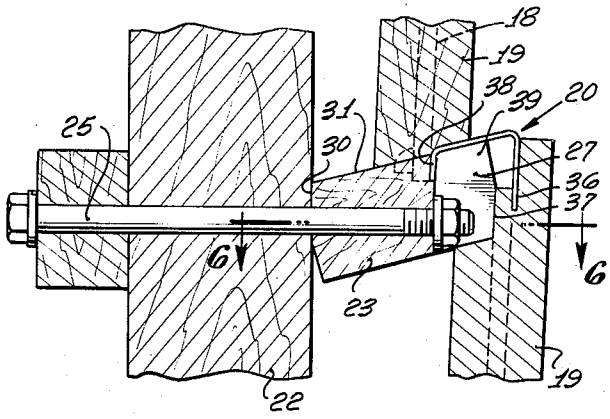


FIG. 6.

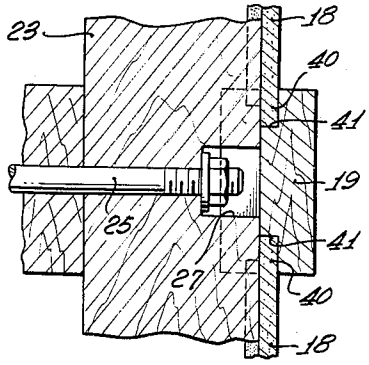
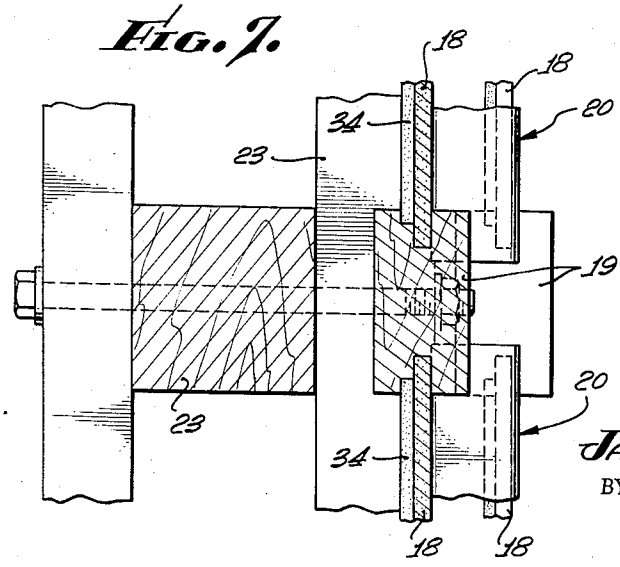


FIG. 7.



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COOLING TOWER WALL ASSEMBLY

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Application May 5, 1958, Serial No. 732,874

11 Claims. (Cl. 20—.5)

This invention relates generally to the fabrication of cooling towers and more particularly concerns the construction and arrangement of tower walls and the components thereof facilitating their rapid fabrication so as to reduce the expense and hand labor involved in building such towers.

It is the conventional practice in fabricating cooling towers, and particularly the walls thereof, to cover the exterior of the tower framework with nailed wooden siding, exterior as well as interior scaffolding being required for this purpose. It is the principal object of the present invention to eliminate the need for such exterior scaffolding and likewise to speed up the construction or fabrication of the tower wall through the provision of novel wall components easily erected and assembled at the interior of the tower framework by workmen standing on interior scaffolding and who may reach through the tower framework to the exterior and rapidly assemble the wall components.

Accordingly, the novel wall construction contemplated by the invention comprises, broadly, a framework including vertically spaced horizontally extending substantially parallel supports, horizontally extending vertically spaced rows of preferably rectangular panels carried by the supports and projecting upwardly and outwardly away from the tower framework, and retainers also carried by the supports extending outwardly and downwardly over the free upper edges of the panels for holding them to the framework. In addition, the upright opposite edges of horizontally spaced panels are connected by upright members also projecting upwardly and outwardly away from the tower framework. Thus, workmen may easily reach through the tower framework, starting at the bottom of the wall to be constructed, lay up the panels one at a time on lower horizontal supports, and secure the panels in position by placing the bracket type retainers on upper horizontal supports while simultaneously causing the retainers to overlap the free upper edges of the laid up panels for holding them to the framework. As each panel is positioned on its horizontally extending support, one of the panel upright edges may be interconnected with an upright member or mullion previously connected to the adjacent panel, so that the panels may be emplaced in horizontal sequence to form the rows which are built up in upward sequence.

These and other objects and advantages of the invention, as well as the details of an illustrative embodiment, will be more fully understood from the following detailed description of the drawings, in which:

Fig. 1 is a perspective view of a cooling tower whose walls embody the improvements which are the subject of the present invention;

Fig. 2 is a wall section taken on line 2—2 of Fig. 1;

Fig. 3 is a frontal elevation of a portion of the wall exterior as taken on line 3—3 of Fig. 2;

Fig. 4 is a vertical section taken on line 4—4 of Fig. 3;

Fig. 5 is a vertical section taken on line 5—5 of Fig. 3;

Fig. 6 is a horizontal section taken on line 6—6 of Fig. 5; and

Fig. 7 is a horizontal section taken on line 7—7 of Fig. 4.

Referring first to Fig. 1, the cooling tower is generally shown at 10 as having side and end walls 11 and 12, an upper deck 13 and air discharge stacks 14 on the upper deck. Fans 15 in the stacks are rotated by motors 16 to displace cooling air upwardly from within the tower interior, the air having been previously drawn into the tower through louvers 17 at the lower sides of the tower for cooling water sprayed therein. As is shown, the side and end walls 11 and 12 exclusive of the louvers are made up of a series of horizontal rows of panels 18 interconnected by upright members or mullions 19, the panels appearing to be inclined upwardly and outwardly to a slight extent, and to be held in this position by the horizontally elongated retainers 20 overlapping the upper edges of the panels. The broken away portion of Fig. 1 shows the framework 21 which includes vertical posts or columns 22 and vertically spaced horizontally extending substantially parallel supports 23 or girts carried by the posts.

A better understanding of the tower wall assembly may be had by reference to the remaining figures in which cross sections through the wall show that the horizontal supports or girts 23 are connected to the posts or columns 22 by bolts 25 and 26, the latter extending horizontally outwardly through the wooden posts and girts, and terminating within notches 27 cut inwardly from the outer sides of the girts, a washer and nut threaded on the bolt end also being received within each notch. Referring specifically to Figs. 4 and 5, the girt or support 23 is shown held in tilted position by the bolt 25 with a bevel 30 on the girt engaging the column outer side so that the girt upper surface 31 slopes inwardly and downwardly for draining water inwardly away from the panel 18. The lower portion 32 of the latter is received in a rectangular groove 33 sunk downwardly in the upper surface 31 in the girt or support 23, and a suitable seal or packing material 34 is inserted in a second groove 35 at the inside of the panel for sealing off between the support and the panel inner side.

Each panel 18 projects upwardly and slightly outwardly, terminating at the outside of the next above support 23 as viewed in Figs. 2, 4 and 5. In order that the panels may be held in this position, the channel shaped retainers 20 have outer flanges 36 extending downwardly in overlapping relation with the upper terminal portions of the panel 18 holding the latter against the bevel 37 on the support 23. The channel inner flange 38 is received downwardly in the notch 33 between the lower portion 32 of the next above panel and the upstanding portion 39 of the support 23 blocking outward displacement of the channel retainer. In addition, portion 39 of the support carries the outwardly projecting portion of the retainer, and it will be understood that during wall assembly the retainer flange 38 is dropped into the notch 33 and the retainer is then rotated clockwise to bring the flange 36 into overlapping relation with the upper terminal portion of the lower panel 18 to lock it into position. Thereafter the next above panel 18 is inserted in the notch 33 frictionally to lock the retainer inner flange 38 into position therein, after which the packing material 34 is inserted in groove 35 to form a water-tight assembly.

The retainers 20 are desirably of elongated metallic construction and may be conveniently extruded. They preferably comprise aluminum or an aluminum alloy, but may of course comprise any other suitable material.

Referring now to Figs. 3, 6 and 7, the upright members or mullions 19 holding the opposite upright edge portions 40 of horizontally adjacent panels in interconnected condition are shown in detail. The wooden mullions have

upwardly extending notches 41 sunk inwardly from their horizontally opposite sides for receiving the panel edge portions 40 in fitted relation therewith. In addition the mullions are supported on the upper surfaces 31 of the horizontal supports 23 and extend upwardly and outwardly, parallel to the panels, to terminate outwardly of the next above horizontal supports 23. As described previously, each horizontal row of panels is built up in combination with the interconnecting mullions, and as a result the sides of each panel are connected with panels and girts adjacent thereto to rigidize the assembly. Also, as previously mentioned, the rows of panels are installed from the bottom upwardly, since the retainers 20 must be placed in position on the supports 23 before the next above panels 18 are inserted in the notches 33.

The panels themselves preferably comprise a fireproof material, and an asbestos cement composition board known under the trade name "Transite," has been found highly desirable for this purpose.

Fig. 1 shows the construction at the corners of the tower, vertical plates 50 and 51 being interconnected with the end mullions and with one another to seal the corners of the tower. It will be observed that the construction of the tower walls is relatively tight, preventing inflow of air into the tower chamber, excepting of course through the louvers 17. Also, sections of the girts 23 are spliced together at scarf joints 6*a* between the posts, as shown in Fig. 1.

Figs. 2, 5 and 6 show that the notches 27 cut into the girts extend vertically therethrough for draining any water or seepage standing in the retainers at the outside of the panels back into the tower chamber as indicated by the arrows in Fig. 5. Thus it is not possible for a leak to drain down the outside of the tower for more than the height of one panel 18.

I claim:

1. An improved cooling tower wall construction, comprising a framework including vertically spaced horizontally extending substantially parallel supports, means carried by said supports including horizontally extending vertically spaced rows of panels projecting upwardly and outwardly from said framework, and retainers carried by said supports extending outwardly and downwardly over the free upper edges of said means for holding said panels to said framework, said retainers having inner portions held by lower portions of the panels against outward bodily displacement relatively away from the supports.

2. An improved cooling tower wall construction, comprising a framework including vertically spaced horizontally extending substantially parallel supports, means carried by said supports and extending therealong including horizontally extending vertically spaced rows of upright panels projecting upwardly and outwardly from said framework and members interconnecting the panel upright edges, and retainers carried by said supports extending outwardly and downwardly over the free upper edges of said means for holding said panels to said framework, said retainers having inner portions held by lower portions of the panels against outward bodily displacement relatively away from the supports.

3. An improved cooling tower wall construction, comprising a framework including horizontally spaced columns and vertically spaced substantially parallel supports extending horizontally at the outer sides of said columns, means carried by said supports and extending therealong including horizontally extending vertically spaced rows of upright panels projecting upwardly and outwardly from said framework and members interconnecting the panel upright edges, and retainers carried by said supports extending outwardly and downwardly over the free upper edges of said means for holding said panels to said framework, said retainers having inner portions held by lower portions of the panels against outward bodily displacement relatively away from the supports.

4. An improved cooling tower wall construction, comprising a framework including horizontally spaced columns and vertically spaced substantially parallel supports extending horizontally at the outer sides of said columns, means carried by said supports including horizontally extending vertically spaced rows of upright rectangular panels extending along the upper sides of said supports and projecting upwardly therefrom and outwardly from said framework at the outer sides of the next above supports, and inverted channel shaped retainers carried by said supports extending outwardly and downwardly over the free upper edges of said panels for holding the panels to said framework, said supports having horizontally extending grooves sunk downwardly in their upper sides and receiving the lower edge portions of said panels, and said retainers having inner flanges held in said grooves by said panel lower edge portions.

5. The invention as defined in claim 4 in which said retainers are horizontally elongated and fit downwardly against the upper sides of said supports.

6. The invention as defined in claim 5 including packing in said grooves sealing off betwcen the inner faces of said panels and said supports.

7. The invention as defined in claim 6 in which the upper sides of said supports are sloped inwardly and downwardly at the inner sides of said panels for draining moisture therefrom.

8. The invention as defined in claim 4 in which said panels in each row are spaced apart, and in which said means include upright members between said spaced apart panels having grooves in opposite sides thereof receiving upright edge portions of said panels.

9. The invention as defined in claim 8 in which the upper edges of said panels extend adjacent the outer sides of the supports carrying the next above panels.

10. The invention as defined in claim 9 in which said panels are composed of asbestos and cement.

11. The invention as defined in claim 8 in which said retainers in each row are spaced apart, and in which said supports have drainage openings extending therethrough from the space between said retainers at the outside of tower wall downwardly to the inside of the tower wall.

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