June 12, 1934. A. J. MUELLER 1,962,906

BUILDING TILE

Original Filed Dec. 17, 1930

Fig.1

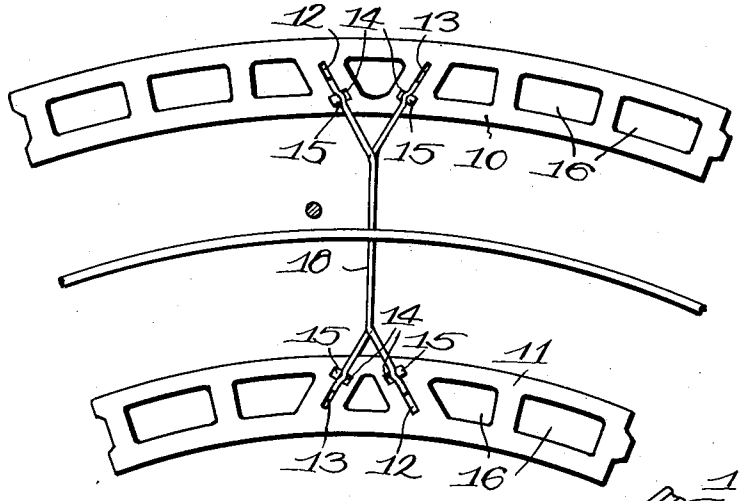



Fig.2

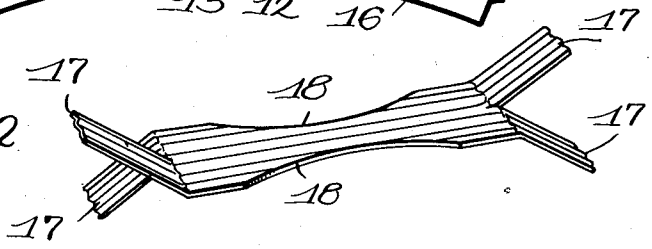



Fig.3

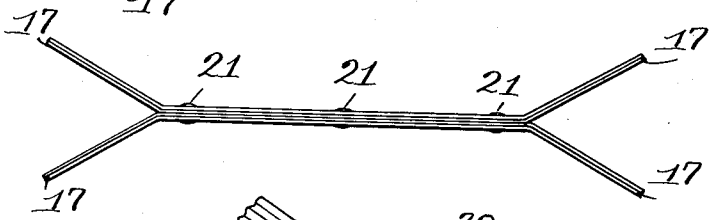



Fig.4

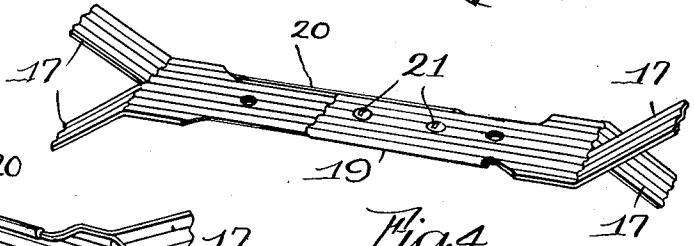



Fig.5

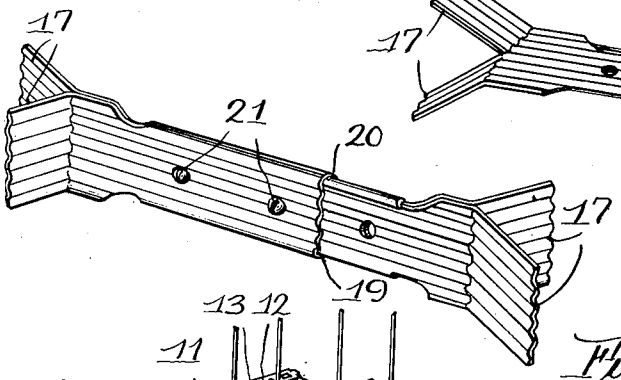
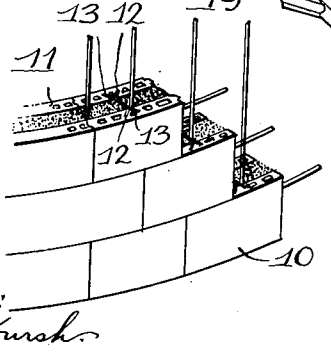



Fig.6




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# UNITED STATES PATENT OFFICE

1,962,906

## BUILDING TILE

August J. Mueller, Chicago, Ill.

Application December 17, 1930, Serial No. 502,923
Renewed November 22, 1933

3 Claims. (Cl. 72—44)

My present invention relates to improvements in building tile and has reference more particularly to tile for building tall chimneys or stacks.

I am aware that tile has heretofore been provided for surfacing chimneys or stacks of reinforced concrete construction wherein the tile, when laid, constitutes not only the surfacing for the stacks, when completed, but also constitutes the forms for receiving the reinforcements and the casting of the concrete.

I am also aware that there has heretofore been provided separate interior and exterior plates of tile held together and in spaced relation by means of metal webs. My present tile, however, while being of the last above named variety, differs from any tile heretofore appearing on the market in that the assembly of the interior and exterior tile plates with the metal connecting web permits of a considerable latitude of adjustment of the tile plates so as to secure a different spacing between the plates and a different angular relation between the plates. Such adjustability is often highly desirable. For instance, the tile plates not infrequently warp in manufacture, which warping can be completely or largely overcome by adjustment. Again, the walls of high chimneys or stacks diminish in thickness as they rise from the footing or foundation.

Without an adjustable linkage between the exterior and interior tile facing plates, a number of different sizes of tiles or connecting webs must be provided to permit of the diminishing thickness of the walls and even then the structure will have a somewhat broken or stepped character, whereas with my adjustable tile, by swinging the exterior plates vertically, as well as adjusting the spacing between the exterior and interior tiles, a more perfect cone, or, if desired, entasis, may be secured.

As will hereafter be seen, I suggest as a material for forming the connecting web the employment of commercial corrugated sheets. The webs are cut from these sheets so that the corrugations will extend longitudinally of the webs or horizontally with respect to the structure, which, with a given weight of metal, secures greater rigidity between the exterior and interior tile plates. The webs are also reduced or diminished at their centers to accommodate horizontal reinforcing rods. There is always plenty of space for vertical reinforcing rods in such structures.

Either one or a plurality of plates may be employed for a single connecting web, and I prefer to branch the ends of the webs and provide diverging slots in the tiles for accommodating these branched ends. After the branched ends of the connecting webs have been introduced a desired distance into the slots in the tile plates, they are secured therein by wedges. Some adjustment is possible by introducing the ends of the connecting webs a greater or less distance into the slots of the tile. Additional adjustment is secured by cutting off more or less of the branched ends of the connecting webs, and it will also be seen that almost any extent of adjustability can be secured by employing a connecting web formed as hereinafter described from two, three or four sheets of metal bolted together.

I have secured the hereinbefore indicated objects and results by means of the structure illustrated in the accompanying drawing in which—

Fig. 1 is a plan of an assembly of exterior and interior tile plates with a connecting web embodying my present invention.

Fig. 2 is a perspective of a connecting web made from a single sheet of corrugated metal.

Fig. 3 is a plan of a connecting web made from two sheets of corrugated metal.

Fig. 4 illustrates how the web shown in Fig. 2 may be cut intermediate its ends and secured together so as to secure an adjustable spacing of the tile plates.

Fig. 5 shows how the structure shown in Fig. 3 may likewise be arranged to secure an adjustability in the spacing of the tile plates.

Fig. 6 is a perspective of a construction comprising three courses of my tile in position.

Similar reference characters refer to similar parts throughout the respective views.

Facing tile for chimneys or stacks are, preferably, slightly arcuate in plan, such curvature having relation to the diameter of the chimney to be constructed, although a single form and size of tile may be used for stacks of different diameters.

I have shown in the drawing a slightly curved exterior tile plate 10 and a likewise slightly curved interior tile plate 11. Centrally of the interior opposed faces of these exterior and interior tile plates are preferably provided diverging vertical grooves 12 and 13. The walls of the grooves 12 and 13 may also be provided with opposed interior grooves 14 and 15 for co-operating with wedges or turned over portions of the metal connecting web for locking the web to the tile.

The exterior and interior tile plates may also be provided with a series of air chambers, 16, if desired, for securing heat insulating effects.

For securing the exterior and interior tile plates 10 and 11 in desired spaced relation, I cut from a piece of corrugated sheet metal a piece having parallel, straight end edges 17, the longitudinal edges of the tie or connecting web being incurved, as at 18. This incurving of the central portions of the longitudinal edges of the tie web is for permitting the placing of horizontal reinforcing bars and also for permitting the joining of the masses of concrete on opposite sides of the webs.

A tie web formed as above described may be cut back at right angles centrally of its end edges so as to bend the upper end portion to go in one of the slots 12 or 13 and bend the lower portion of the tie web to go in the other slot 13 or 12. When the diverging ends of the tie web are introduced sufficiently far into the grooves 12 and 13 to secure the desired adjustment between the tile plates 10 and 11, nails or other wedges 15*a* are driven into the interior grooves 14 or 15, which serve to lock the assembly in adjusted position.

It is obvious that the ends of the tie web may be introduced a greater or less distance into the diverging grooves and also that the plates 10 and 11 may be swung slightly from the vertical before locking the same to the tie web with the wedges.

When the size of the structure renders it desirable to employ a tie web formed of two plates of metal, as shown in Fig. 3, it is suggested that a portion of one sheet, as at 19, and the other edge of the opposite sheet, as at 20, be rolled or seamed over, which will add rigidity to the tie web as well as securing additional desirable results. When two sheets have been formed into a web with turned edges and bolted, as shown at 21, they will be found to be firmly locked together and when, in addition, the ends of such a tie web are wedged into the slots of the tile plates no giving or slipping need be apprehended.

Such structures as previously described permit some latitude of adjustment, but, in the building of stacks of considerable height the increase in the thickness of the walls from the top to the bottom of the stacks is such that it is desirable to construct tie webs, as are shown in Figs. 4 and 5.

The tie web shown in Fig. 4 may be regarded as produced from forms shown in Fig. 2, elongated and cut vertically through the center, the inner ends of both portions being provided with a number of spaced bolt holes, so that by changing the registry of the bolt holes in the respective parts the tie webs may be adjustably elongated or reduced in length.

The tie webs shown in Fig. 4 may likewise be regarded as elongations of the tie webs shown in Fig. 3, which have also been cut vertically in two in the center and provided with registering bolt holes. As a matter of practical operation the webs herein shown may each and all be readily produced at very little expense and tiles assembled as herein described may be economically assembled and set to provide uniformly tapered walls of a better and more uniform appearance than can be secured by any combination of different sizes and shapes of tile.

Having described my invention what I claim as new and desire to secure by Letters Patent is:

1. A tile for cast concrete construction comprising an inner and an outer tile plate, which plates are provided intermediate their ends on their interior opposing faces with vertical diverging slots, a tie web having diverging ends for entering said slots in said plates, and means for locking a greater or less portion of the ends of said web in said slots, whereby said plates may be secured together by said web with vertical and horizontal angular adjustment.

2. A tile for cast concrete construction comprising an inner and an outer tile plate, which plates are provided intermediate their ends on their interior opposing faces with vertical slots, a tie web having ends for entering said slots in said plates, and means for locking a greater or less portion of the ends of said web in said slots, whereby said plates may be secured together by said web in adjusted vertical angular relation.

3. A tile for cast concrete construction comprising an inner and an outer tile plate, which plates are provided intermediate their ends on their interior opposing faces with vertical slots, a tie web having ends for entering said slots in said plates, and means for locking the ends of said web in said slots comprising slots intersecting said first mentioned slots, and wedges co-operating therewith.

AUGUST J. MUELLER.