

June 11, 1935.

J. B. EEN

2,004,553

ARMED WOODEN PLATE AND ARMATURE BAR FOR THE SAME

Filed June 20, 1933

2 Sheets-Sheet 1

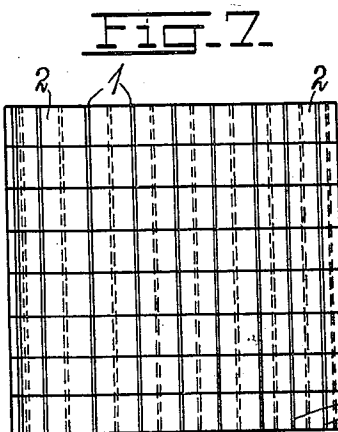
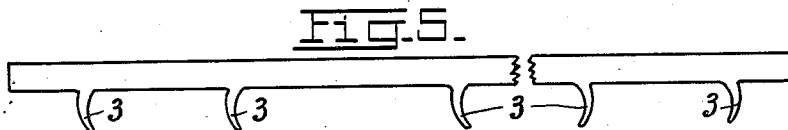
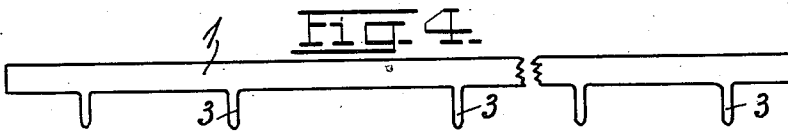
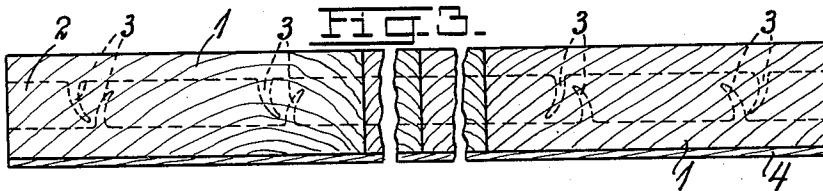
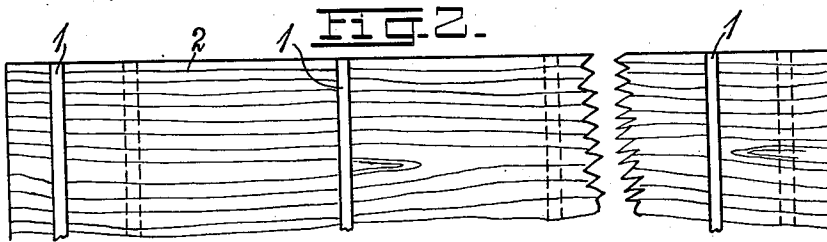
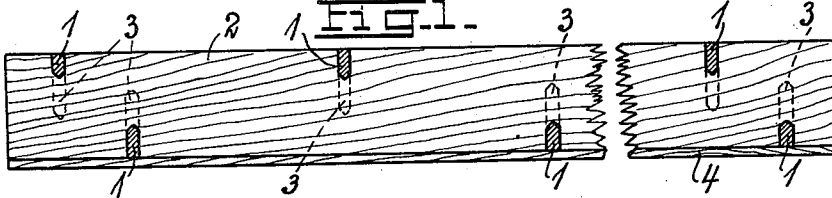


FIG. 6a.



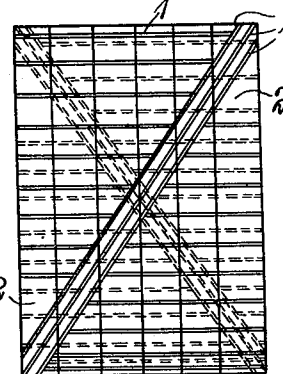
FIG. 6b.



FIG. 6c.



FIG. 8.



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2 Sheets-Sheet 2

Fig. 9.

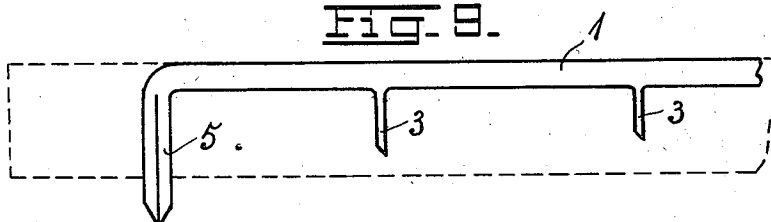


Fig. 10.

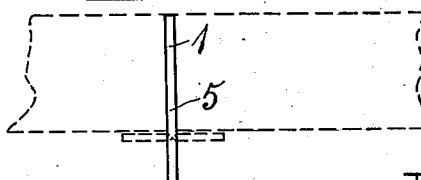


Fig. 11.

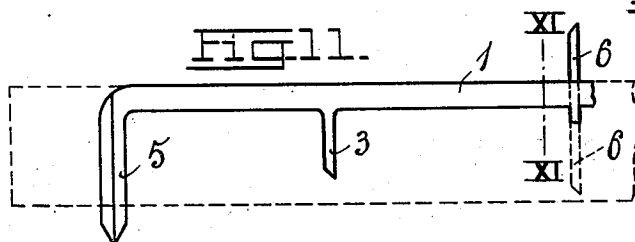


Fig. 12.

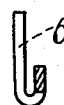


Fig. 13.

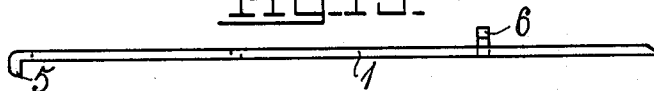


Fig. 14.

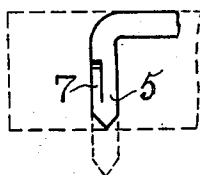


Fig. 15.

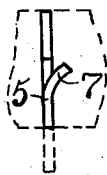


Fig. 16.

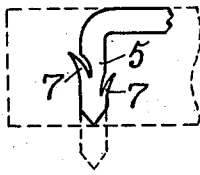
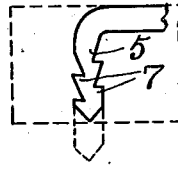


Fig. 17.



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UNITED STATES PATENT OFFICE

2,004,553

ARMED WOODEN PLATE AND ARMATURE
BAR FOR THE SAME

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Application June 20, 1933, Serial No. 676,754
In Norway June 23, 1932

9 Claims. (Cl. 20—91)

My invention relates to armed wooden plates or sheetings made of boards or planks with or without grooves and tongues, and reinforced by aid of inlaid metal bars. It has already been proposed to make a saw cut in the end wood of wooden box sections and to force a metal strip into this sawcut in order to establish a cross connection without the use of wooden cross-pieces. This arrangement, however, can only be used for quite small wooden plates or sections. For larger wooden plates or sections one has been obliged to use crosstrees or—as for sheeting for concrete casting purposes—one has used plates made of two crosslaid layers of boards, nailed together, which is, however, rather expensive.

According to my invention I reinforce and keep together a single layer or row of boards or planks placed side by side by aid of toothed bars of iron, steel or other suitable metal, said bars being from both sides pressed into transverse or oblique grooves made in the opposite surfaces of the boards, the teeth preferably penetrating the boards to their median planes or still deeper, and thereby effectively counteracting the formation of openings between the boards owing to their contraction when dried out, and also counteracting their swelling owing to moisture. At the same time the rigidity of the inserted bars prevents the wooden plates from being warped.

A number of executional forms of the invention are illustrated in the accompanying drawings, in which:

Fig. 1 is a longitudinal section of an individual board of an armed wooden plate according to my invention, the armature bars being shown in cross section.

Fig. 2 is a corresponding top view of the same board.

Fig. 3 is a cross sectional view of the armed wooden plate, with parts broken away.

Fig. 4 is a side view of an armature bar with straight teeth and

Fig. 5 a corresponding side view of an armature bar, having the teeth of one half of it curved slightly against the curved teeth of the other half.

Figs. 6a, 6b and 6c are cross sectional views of armature bars with straight teeth, teeth curved to one side and teeth curved to both sides, respectively.

Fig. 7 is a plan view on a smaller scale of a wooden plate, having its armature boards placed transversely to the boards of the plate, and

Fig. 8 is a corresponding plan view of a plate, having its armature bars placed both transversely and diagonally and crosswise.

Fig. 9 is a side view of one end of an armature bar, having teeth of varying lengths and with the end tooth split up, and

Fig. 10 is a corresponding end view with the ends of the split-up tooth shown in broken lines bent at right angles after being driven right through the wooden plate.

Fig. 11 is a side view of an armature bar and Fig. 12 a cross sectional view on line XI—XI, Fig. 11, and Fig. 13 is a top view of the same bar.

Figs. 14, 15, 16 and 17 illustrate—in side views—various forms of barbs, arranged on the end teeth of the armature bars.

In Figs. 1, 2 and 3 the armature bars 1 are pressed into grooves, made preferably by saw-cuts, in the board plate 2 to such a depth that the back of the bars lies flush with the surface of the plate. The teeth 3 are straight as seen from the end, but a little curved as seen from the side, their points being from both sides directed against the middle of the bar. The teeth of the bars pressed in from opposite sides of the plate are arranged so as to be somewhat displaced in relation to each other, and both sets of teeth penetrate so far into the wood as to pass its median plane. The plate may on one or both sides be covered by a plate 4 of veneer or by a layer of cardboard, linen or the like.

Fig. 4 illustrates an armature bar with straight teeth 3, and Fig. 5 a bar with curved teeth, said teeth being near the ends of the armature bars arranged with shorter spaces between them than at the middle, where the stress is not so powerful as at the ends. When the curved teeth are pressed into the wood, they must follow the direction given by their curvature and will hereby flare in the direction of the curvature.

Figs. 6a, 6b and 6c illustrate armature bars having, respectively, straight teeth, teeth curved to one side and teeth curved alternately to either side.

Fig. 7 illustrates a plate designed to be used on both sides as a sheeting for the casting of concrete walls, and therefore provided with a powerful armature.

Fig. 8 illustrates a plate designed for use as a door or gate, and having beside the usual transverse armature also a diagonal armature for taking up diagonal stresses.

Figs. 9 and 10 illustrate an armature bar having teeth of varying lengths. The bar terminates in a split tooth 5, serving as a strong anchorage of the end of the bar, the split end of this tooth being after having been driven right through the plate, bent up to either side as indi-

cated in broken lines in Fig. 10. Instead of being split, this end tooth 5 may be provided with barbs 7 of some form or other, as illustrated in Figs. 14 to 17, or it may be provided with a split as well as with barbs.

For the assembly of the plates during transportation and for the provisory mounting of the plates on a scaffolding, when the plates are to be used as sections for the building of plate walls or the like, the plates as illustrated in Figs. 11, 12 and 13 may be provided with one or more relatively long teeth 6 which are bent at an angle of approximately 180° transversely to the longitudinal direction of the bar. These teeth therefore will stand out sidewise from the plate after the armature bar has been driven into place.

The grooves for the armature bars are made slightly narrower than the width of the bars, in such manner that a certain amount of force is necessary to drive the bars into the grooves, and the bars driven in will be under a constant pressure from the side walls of the grooves and will not have any occasion to be deformed in a transverse direction.

As already mentioned, the armature bars may be driven in so deep as to lie with their backs flush with the outer face of the plate, but they may also be driven further in on one side of the plate than on the other.

Besides for the purposes already mentioned, my armed wooden plates may be used in the making of furniture and the like articles and also for the making of walls, ceilings and floors, plates being designed for the making of partitions, being dimensioned so as to reach from floor to ceiling.

I claim:

1. In armed wooden plates for building, furniture and the like purposes the combination of a single row of boards, placed side by side, with grooves arranged crosswise over the whole width of said row of boards, armature bars driven into said grooves, and teeth on said armature bars, adapted to be driven into the boards at the bottom of said grooves, said teeth being of varying length, the length being greater near the ends of said bar than at the middle.

2. In armed wooden plates for building, furniture and the like purposes, the combination of a single row of boards, placed side by side, with grooves arranged crosswise over the whole width of said row of boards, armature bars driven into said grooves, and teeth on said armature bars, adapted to be driven into the boards at the bottom of said grooves, said teeth being of varying length, the length being greater near the ends of said bar than at the middle, and the spaces between said teeth being larger near the ends of said bar than at the middle.

3. In armed wooden plates for building, furniture and the like purposes, the combination of a single row of boards, placed side by side, with grooves arranged crosswise over the whole width of said row of boards, armature bars driven into said grooves, and teeth on said armature bars, adapted to be driven into the boards at the bottom of said grooves, said teeth being curved, their points pointing inwards towards the middle of the bar.

4. In armed wooden plates for building, furniture and the like purposes, the combination of

a single row of boards, placed side by side, with grooves arranged crosswise over the whole width of said row of boards, armature bars driven into said grooves, teeth on said armature bars, adapted to be driven into the boards at the bottom of said grooves, teeth provided with a split arranged at the ends of said bars.

5. In armed wooden plates for building, furniture and the like purposes, the combination of a single row of boards, placed side by side, with grooves arranged crosswise over the whole width of said row of boards, armature bars driven into said grooves, and teeth on said armature bars, adapted to be driven into the boards at the bottom of said grooves, teeth provided with barbs being arranged at the ends of said bars.

6. In armed wooden plates for building, furniture and the like purposes, the combination of a single row of boards, placed side by side, with grooves arranged crosswise over the whole width of said row of boards, armature bars driven into said grooves, and teeth on said armature bars, adapted to be driven into the boards at the bottom of said grooves, and teeth on said armature bar, bent so as to project from the side of the finished plate after the said bars have been driven in.

7. In armed wooden plates for building and the like purposes the combination of rows of boards placed side by side, with narrow vertical grooves of rectangular cross section arranged crosswise over a plurality of said rows of boards, armature bars of rectangular cross section fitting and driven into said grooves, and spaced, nailshaped teeth having sides at right angles to the greatest stresses against said nails and the nails protruding from the under side of said armature bars and sufficiently long to be driven into the boards at the bottom of said grooves, said toothed armature bars being driven in from opposite sides of the boards.

8. In armed wooden plates for building and the like purposes the combination of rows of boards placed side by side, with narrow vertical grooves of rectangular cross section arranged crosswise over a plurality of said rows of boards, armature bars of rectangular cross section fitting and driven into said grooves, and spaced, nailshaped teeth protruding from the under side of said armature bars and sufficiently long to be driven into the boards at the bottom of said grooves, said toothed armature bars being driven in parallel to each other from opposite sides of the boards, but spaced relatively to each other.

9. In armed wooden plates for building and the like purposes, the combination of rows of boards placed side by side, with narrow vertical grooves of rectangular cross section arranged crosswise over the whole width of said row of boards, armature bars of rectangular cross section fitting and driven into said grooves, and spaced, nailshaped teeth protruding from the under side of said armature bars and adapted to be driven into the boards at the bottom of said grooves, said armature bars adapted to be driven into said grooves to a depth so as to have their backs flush with the outer surfaces of said row of boards with their backs, and a cover plate covering the surface of said armed plate.