Nov. 4, 1930. J. A. STEVENS 1,780,280

HEAT TRANSMITTING PLATEN

Filed May 10, 1928

Fig. 1

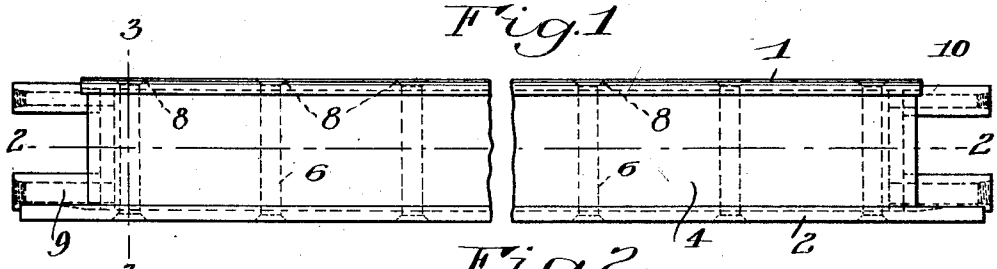


Fig. 2

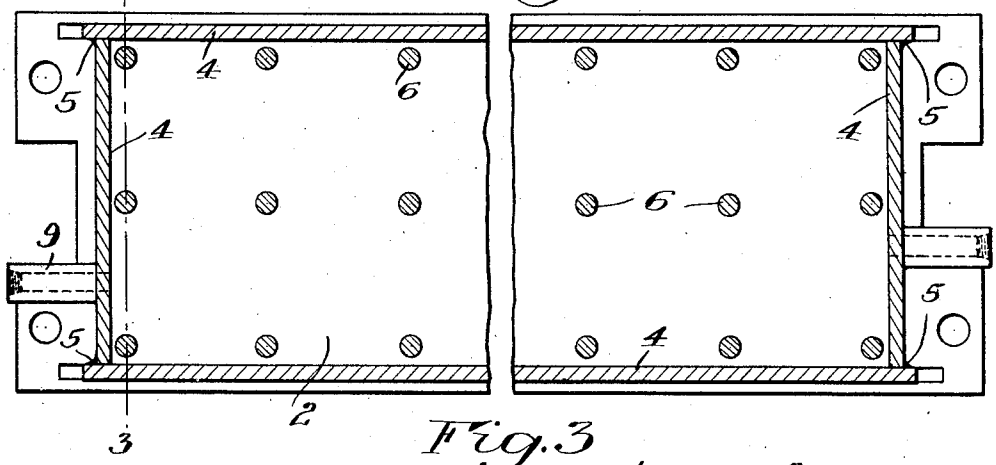


Fig. 3

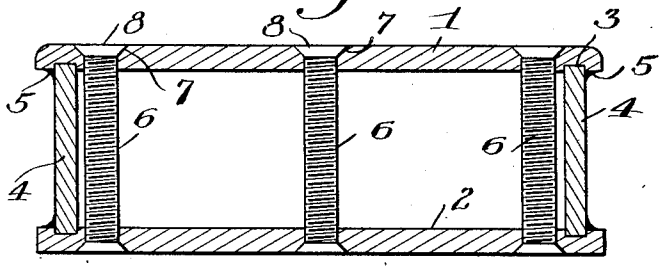


Fig. 4

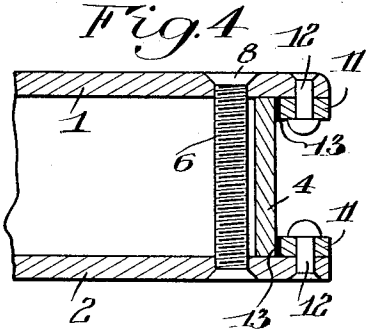


Fig. 5

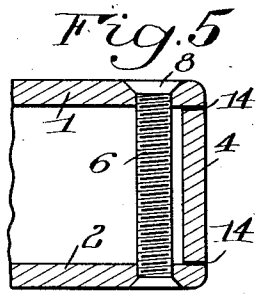
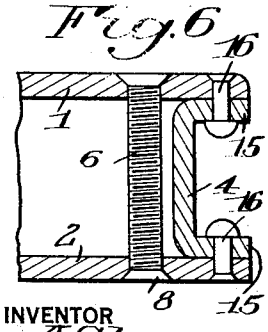


Fig. 6



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UNITED STATES PATENT OFFICE

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HEAT-TRANSMITTING PLATEN

Application filed May 10, 1928. Serial No. 276,793.

My present invention relates to heat transfer, and more particularly to the construction of steam or other gas, air or liquid heated platens, and shaping elements useful, for instance, in the manufacture as a continuous process of sheets and boards, or other forms of material, requiring heat treatment, such as, for example, composite board used as building material and other services. The invention has for its object to provide a simple, strong and reliable platen of this character, and a method of producing the same, whereby, under the heat and pressure of actual use, it will maintain its shape, and accurately heat and shape the product upon which it acts.

To these and other ends the invention resides in certain improvements and combinations of parts, all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings:

Fig. 1 is an end view (according to the directions of travel of the material acted upon) of a platen constructed in accordance with and illustrating one embodiment of, my invention, the same being shown broken away at the center;

Fig. 2 is a central horizontal sectional view taken substantially on the line 2—2 of Fig. 1;

Fig. 3 is an enlarged vertical sectional view taken substantially on the line 3—3 of Figs. 1 and 2;

Fig. 4 is an enlarged fragmentary sectional view corresponding to Fig. 3, but showing a modified construction;

Fig. 5 is an enlarged fragmentary sectional view corresponding to Fig. 3, showing another modified construction, and

Fig. 6 is an enlarged fragmentary sectional view corresponding to Fig. 3 showing still another modified construction.

Similar reference numerals throughout the several views indicate the same parts.

Although applicable in other instances, the present invention has been designed in the embodiment shown to facilitate the manufacture of a particular type of board sheets or other material for building or other construction, said board or other material embodying generally two facings or liners of paper enclosing an interior body of mineral or other material, the latter added for the purpose of strengthening and stiffening the board and also rendering it a water-resisting, fire-resisting, and sound and shock-proof agent. An example of such board is one in which a mixture containing silicate of soda and dolomitic limestone or other material is introduced between liner sheets and then heat treated at a temperature sufficient to intumesce the said mixture, and cause it, when hardened, to form a firm cellular mass between the liners. The heat is applied and the ultimate thickness of the board determined by drawing it through a plurality of steam, or otherwise heated platens arranged in opposed and suitably spaced sets.

This invention has to do with the construction of the platen units, per se and it has therefore been deemed unnecessary to give a showing of a complete machine of this character, as long as the utility of the present invention can be explained in the foregoing general way.

Referring more particularly to the drawings, each platen unit, of which a multiplicity are used in a complete machine, comprises a back plate 1, and a face plate 2, the latter being the exactly machined surface which contacts with the surface of the product which it confines, heats and shapes. Each plate, in the preferred form of Figs. 1, 2, and 3, is provided near its side margin with grooves or channels 3 in which fit the top and bottom edges of side plates 4. Each of the joints so made is autogenously welded from the exterior, weldings being indicated at 5.

At suitable intervals throughout their expanse as shown particularly in Fig. 2, the plates are connected together by threaded or other formed staybolts 6, the ends of which pass through counter-sinks 7 in the respective plates, and are riveted down into heads that fill the same, as indicated at 8. Live steam or heat is admitted through suitable connections 9 in the side plates, and exhausted through similar connections 10.

For the purpose of the particular applica-

tion of the invention hereinbefore outlined, the platens are designed for a corresponding temperature of 125 to 200 pounds steam pressure or more, with an ultimate bursting pressure of not less than 5 times the working pressure. In order to insure the regularity and fineness of the working surface of the face plate 2 in contact with the product at the range of temperature given, I prefer, as a part of my present invention, to machine the said surface at this working temperature, or at an average of the intended range of working temperatures. In other words, the riveted heads of the staybolts 6, and the face plate 2 is planed and surfaced with the platen at its working temperature and pressure. Thus, there is no probability or possibility of the platen coming into use in a warped condition, which might otherwse occur, due to the various temperatures and tensions which it undergoes in the steps of the construction described.

In Fig. 4 I have shown a modified construction in the matter of the attachment of the side plates 4. In this instance the back and face plates 1 and 2 are extended beyond the side plates a more considerable distance, and instead of letting the side plates into grooves in these adjacent plates, the extensions of the latter aforesaid are provided with cleats 11 riveted at 12, and the autogenous welding is done between these cleats and the side plates as indicated at 13 in said Fig. 4.

In Fig. 5 still another modification is shown in which the side plates 4 are simply autogenously welded at 14 to the margins of the plates 1 and 2.

In Fig. 6 the side plates 4 are shown flanged outwardly at 15, so that they have a channel like formation, and are riveted and caulked to the plates 1 and 2 at 16 with or without accompanying welding.

In all of these later mentioned constructions, the machining of the face plate is accomplished under working pressure and corresponding temperature as before.

I claim as my invention:

1. In a heat transmitting platen element, the combination with a face plate and a back plate, both grooved at their edges, of side plates set into the grooves of said plates at their opposite edges and welded to the material thereof adjacent to said grooves, and a plurality of threaded connecting members each threaded into said face plate at one end and threaded into said back plate at the other end, both ends of asid threaded members being riveted to the respective plates.

2. In a heat transmitting platen element, the combination with a face plate and a back plate both grooved at their edges, of side plates set into the grooves of said plates at their opposite edges and welded to the material thereof adjacent to said grooves, and staybolts connecting the back plate and face independently of the side plates, said staybolts being riveted into countersunk portions of said plates.

3. In the manufacture of heat transmitting hollow platen elements, a method embodying the construction of such an element with a face plate, a back plate and side plates and the subsequent machining of the face plate while held at the temperature corresponding to the intended working heat or steam pressure of the platen.

4. In a heat transmitting platen element, the combination with a face plate and a back plate, of side plates interposed between said face plate and said back plate, and a plurality of threaded connecting members each threaded into said face plate at one end and threaded into said back plate at the other end, one end of each of said connecting members being also riveted to said back plate and the opposite end being riveted into a countersunk portion of said face plate.

JOHN A. STEVENS.