

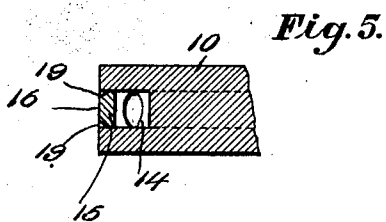
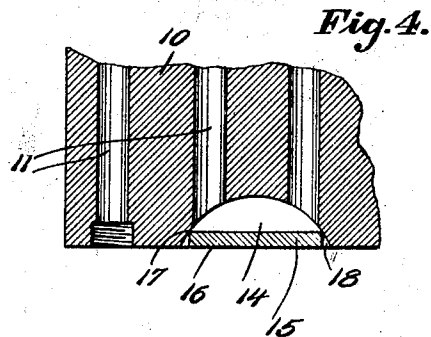
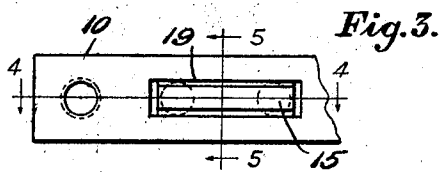
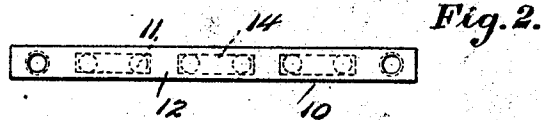
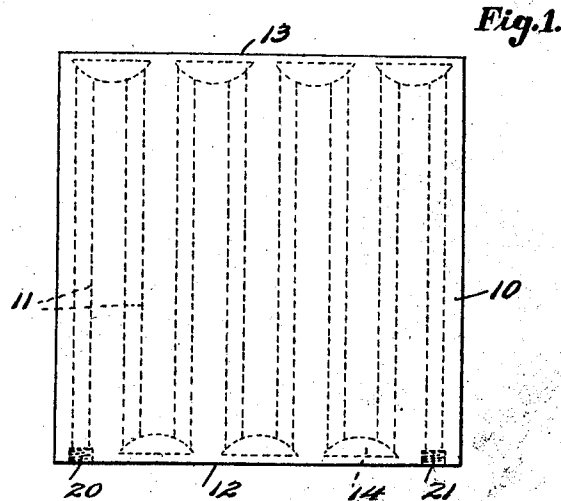
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1,490,706

J. P. MADDEN

HOT PLATE FOR PRESSES AND METHOD OF MAKING SAME

Filed Oct. 12, 1921



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UNITED STATES PATENT OFFICE.

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HOT PLATE FOR PRESSES AND METHOD OF MAKING SAME.

Application filed October 12, 1921. Serial No. 507,222.

To all whom it may concern:

Be it known that I, JAMES PATRICK MADDEN, a citizen of the United States, residing at Bethlehem, Lehigh County, State of Pennsylvania, have invented certain new and useful Improvements in Hot Plates for Presses and Methods of Making Same, of which the following is a specification.

This invention relates to plates used in presses acting on plastic materials which require heating or cooling during the operation. It embodies a novel plate structure having advantages over those ordinarily used and a novel method of forming it. It is well known that in the manufacture of celluloid sheets, rubber blankets and analogous articles of plastic material, the material is pressed between plates and for convenience and economy in operation the presses usually embody a series of parallel plates which are simultaneously pressed together with layers of the material between them. The capacity of a press therefore depends largely upon the thickness of the plates used, and difficulty has been encountered in making them of the desired thinness on account of the necessity for providing circulating means in them for a heating fluid such as steam or a cooling fluid such as water. Plates made of cast iron with integral ducts for the circulating fluid are necessarily made rather thick. According to one embodiment of the present invention therefore, forged and preferably rolled steel plates are used as they are not only stronger, but their structure and method of formation are such that they may be much thinner than cast iron plates while furnishing efficiently the necessary means for heating and cooling. They furthermore avoid the objectionable feature of leaking joints caused by contraction and expansion due to varying temperature encountered in prior efforts to make successful steam plates. However, while particularly applicable to steam plates made from forged steel, it is to be understood that the invention is not limited in this respect and that it may be applied generally to metallic steam plates. The novel features of the invention will be understood from the following description and claims taken with the drawings.

In the drawings:

Fig. 1 is a plan view of the plate with a fluid passageway shown in dotted lines;

Fig. 2 is an edge view of the plate;

Fig. 3 is an enlarged edge view of a portion of the plate embracing two adjacent ducts, showing the assembly of the parts prior to welding;

Fig. 4 is a section 4—4 in Figure 3; and

Fig. 5 is a section 5—5 of the portion of the end plate shown in Figure 3.

In making the embodiment of the invention shown, a metallic plate 10 of substantially uniform thickness and rectangular in outline, is formed in any suitable manner. To provide for circulating fluid through it a series of similar cylindrical parallel ducts 11 are then drilled in the plate from and at right angles to margin 12 in Figure 1. These ducts may be drilled entirely through the plate, but in cases where the ducts are unusually long they may be partially drilled from the margin 12 and completed by drilling from the margin 13. These ducts are preferably spaced equal distances from each other and are parallel to the flat surfaces of the plate. The ducts are of such size and cross section as will leave a proper thickness of metal to withstand the external pressure to which the plate is to be subjected, and at the same time properly distribute and conduct heat from or to them. These separate ducts must be connected together at alternate ends in series to form a continuous passageway for the circulation, and two adjacent ducts are connected together in the following manner. A slot 14 is milled in the margin of the plate (e. g., 12, Fig. 4). The marginal outline of the slot is preferably rectangular and it is symmetrically disposed with reference to the two adjacent ducts. The length of the slot measured in the direction of the longer edge of the margin should be greater than the maximum perpendicular distance between the walls of the two adjacent ducts and the width of the slot measured in the direction of the shorter edge of the margin should be at least equal to the diameter of these ducts. The slot 14 is preferably cut by a circular mill cutter and to a depth sufficient to form a passageway for the circulating medium. The mar-

ginal opening to the passageway thus milled is sealed by means of the closure (15) welded and preferably electro-welded in place. The closure 15 is preferably rectangular in outline and preferably of such thickness as to render its outer flat surface (16) flush with the margin of the plate. It will be observed by reference to Figure 4 that forming the slot in the manner described not only provides a passageway between the adjacent ducts, but also forms a suitable seat 17 for the closure 15 and a V-shaped groove 18 to accommodate the welding material. If desired, in order to facilitate welding, the two opposing edges of the closure 15 may be beveled as at 19.

The depth and width of the slots or grooves 14 milled in the margins are such as to form a passageway within the margin connecting adjacent ducts with a cross sectional area even at its most contracted portions greater than that of a duct so that after the metal plate 15 constituting the closure is welded in place the cross sectional size and its capacity to permit the passage of the heating and cooling fluids will be as great as that of the ducts. The finished plate is shown in Figures 1 and 2, and although the welded closure is integral and flush with the surface of the plate margin its outline is indicated in dotted lines in Figure 2.

It will be understood that the open ends of the first and last ducts of the series are screwthreaded as at 20 and 21 to receive and engage the ends of the supply and discharge pipes.

It will be noted that by the arrangement

of passageways in the plate the heated or cooled fluid will pass in a tortuous passage through the plate, evenly giving off or absorbing heat between points of connections 20 and 21 and that there are no joints liable to become loose and leaky under the strains of contraction and expansion.

It will, of course, be understood that the invention is not limited to the details of structure or procedure shown, or described, beyond what is called for in the claims.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. A hot plate for presses which comprises a forged steel plate having a plurality of symmetrical parallel ducts drilled therein, circular-milled passageways connecting adjacent ducts at alternate ends, said passageways being sealed by marginal closures welded in place.

2. A hot plate for presses which comprises a metallic plate having a plurality of symmetrical parallel ducts drilled therein, circular-milled passageways connecting adjacent ducts at alternate ends, said passageways being sealed by marginal closures welded in place.

3. A metal plate having a plurality of parallel bores extending substantially across the same, opposite edges of said plate being cut away to form segmental grooves interconnecting certain adjacent bores, and closure members partially filling said grooves and secured to the plate.

In testimony whereof I hereunto affix my signature.

JAMES PATRICK MADDEN.