Feb. 2, 1926. 1,571,599

J. F. NORTH

PLATEN FOR VULCANIZING PRESSES AND THE LIKE

Filed March 7, 1922

Fig. 1.

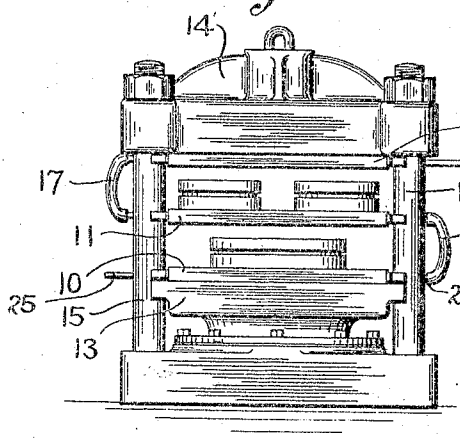


Fig. 5.

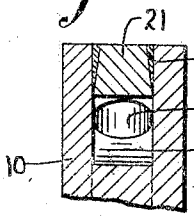


Fig. 3.

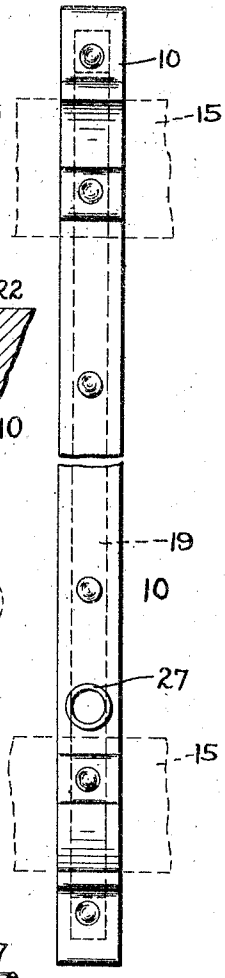


Fig. 2A.

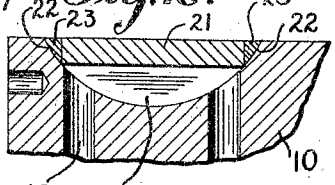


Fig. 2.

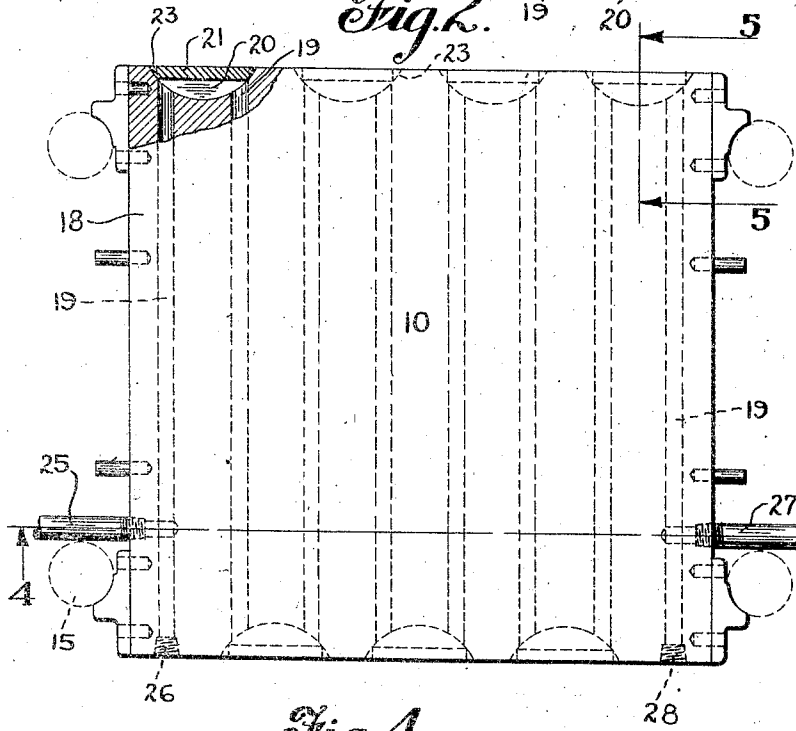
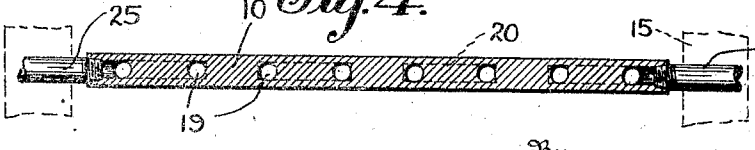


Fig. 4.



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By

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Patented Feb. 2, 1926. 1,571,599

UNITED STATES PATENT OFFICE.

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PLATEN FOR VULCANIZING PRESSES AND THE LIKE.

Application filed March 7, 1922. Serial No. 541,839.

To all whom it may concern:

Be it known that I, J. FRANK NORTH, a citizen of the United States, and residing in Ansonia, county of New Haven, State of Connecticut, have invented certain new and useful Improvements in Platens for Vulcanizing Presses and the like, of which the following is a full, clear, and exact description.

This invention relates to platens for vulcanizing presses and the like and, more particularly, to those which are heated by steam circulating therein for bringing the work to the required temperature for vulcanizing. Platens or plates of this kind are, however, used in connection with hydraulic and other presses for controlling the temperature of the work, either by the circulation of steam or the like for heating or by the circulation of a cooling fluid, such as cold water, for cooling, as required by the nature of the operation being performed, and I do not limit myself therefore to the use of any special fluid.

One of the primary objects of my invention is to provide a platen wherein a relatively long and circuitous interior passage or duct for the temperature controlling fluid may be provided in an economical manner and with certain resultant superiorities in the platen itself. In this connection, it is aimed to produce a platen with a circulating passage or passages formed otherwise than by casting, which latter method has certain manufacturing disadvantages owing to the difficulty of properly forming the circuitous passage by means of cores and then withdrawing the core material from the plate. My invention contemplates, on the other hand, the production of a plate of this character which may be readily produced from a plain rolled plate by drilling, milling or cutting and welding operations performed by tools in common use in a machine shop; and my improved platen or plate is of such a character that simple operations of this kind will enable a very satisfactory article, leak-proof, light in weight and comparatively inexpensive, to be made on a quantity production basis.

Another object of the invention is to furnish a platen of steel or like metal which is comparatively thin, but is nevertheless provided in a convenient manner with an interior heating or cooling passage having a comparatively large number of bends through which the temperature controlling fluid is conducted in a satisfactory manner without likelihood of clogging.

Another object of the invention is to provide an improved method of manufacturing plates of the character above mentioned.

To these and other ends, the invention consists in the novel features and steps hereinafter described and claimed.

In the accompanying drawings:

Fig. 1 is a front elevation of a hydraulic press equipped with platens of my invention;

Fig. 2 is an enlarged top plan view of one of the platens partially broken away;

Fig. 2[A] shows a portion of Fig. 2 on a still larger scale;

Fig. 3 is an edge view of the plate;

Fig. 4 is a section on line 4—4 of Fig. 2; and

Fig. 5 is a detail section on line 5—5 of Fig. 2.

In Fig. 1, I have shown a hydraulic press equipped with platens 10, 11 and 12, which are mounted in the press in the customary manner, being interposed between the upper end of a ram 13 and the head 14 which is supported by the guide rods 15. Where the press is intended for vulcanizing purposes, for example, these platens, which are arranged to contact with the molds, are heated by steam, for which purpose they are provided with interior steam passages as hereinafter described and are interconnected by flexible tubes 16 and 17 so that the steam passes through them successively, as customary in devices of this character.

In constructing the platen, I take a rolled steel plate 18 of generally rectangular or other suitable shape and which is comparatively thin and drill the same edgewise so as to form a plurality of parallel bores or ducts 19 that traverse the plate throughout its width, extending to opposite edges thereof. I then provide for the closing off of the bores at the plate edges and for the creation of communicating passages between certain adjacent ends of contiguous bores so as to create a sinuous circuitous passage. For this purpose the edges of the plate are cut away, as shown at 20, and the cut away edge portions thus formed are then partially

filled in by closure members 21. Preferably the cut away parts 20 are formed by milling, as the desired result may be very conveniently brought about in this manner, and preferably the milling tool cuts a groove in the edge of the plate which is in the form of a segment of a circle, into the side portions of which segment two adjacent bores 19 debouch. Furthermore, where the groove forming the interconnecting passage is of segmental shape, the chord of the segment is preferably slightly longer than the distance between the outer sides of the adjacent bores, as shown in Fig. 2A. The closure 21 preferably consists of a steel strip or elongated plate of a length substantially equal to the distance between the outer sides of the adjacent bores. This strip is fitted lengthwise in the groove, it being of about the same width as said groove, and at its ends it engages the curved wall of the groove at the lower corners of said strip (Fig. 2A), while the outer face of the strip is substantially flush with the corresponding edge face of the plate. By making the groove somewhat longer than the strip, as described, and providing a strip with substantially squared off ends, wedge shaped cavities 22 are created for facilitating the connection of the strip to the plate in their proper relative positions by welding. The strip, being properly placed in the groove, it is a comparatively easy matter to weld the ends of the strip to the plate by flowing molten steel into the wedge shaped cavities heretofore mentioned, which molten steel then solidifies to form a strong and leakproof welded joint 23 at each end of the strip.

At its sides the strip 21 may be likewise welded to the plate in a manner substantially similar to that just described. For this purpose the side faces of the strip 21, instead of being perpendicular to the bottom faces, are bevelled in an inward and upward direction, as shown in Fig. 5, so as to present wedge shaped cavities for welding material 24, thus forming effective welded joints, co-extensive with the side faces of the strip, substantially similar to the welded joints which are co-extensive with the respective ends of the strip, as previously described.

By proceeding in the manner above described, a very effective and satisfactory communicating passage is provided between two adjacent bores, the juncture between each bore and the communicating passage being substantially at an angle to the axis of the bore so as to facilitate the passage of the steam or other temperature controlling fluid into and out of the communicating passage which, in this particular instance, is of greater depth at the middle than at the ends, although I desire to have it understood that it is not necessary, in all cases, to form the cut interconnecting two bores, in a segmental form, nor to produce the same in all cases by milling, as various changes may be made in these respects without sacrificing the advantages of the invention.

It will be apparent also that I do not limit myself in all aspects of the invention to the employment of welded joints formed in the particular manner described, as it will be manifest that if wedge shaped recesses for the welding material are to be employed, they may be produced in other ways while effecting substantially the same result. For example, instead of bevelling or chamfering the side faces of the strip 21, the same may be left perpendicular to the bottom face and wedge shaped recesses formed by bevelling or chamfering the side faces of the edgewise cut in the plate; and instead of providing the strip 21 with perpendicular ends, it may have bevelled ends forming wedge shaped recesses or recesses of other shape, between them and the adjacent surface of the plate for the reception of the welding material.

By proceeding, however, in the general manner herein described, communicating passages between adjacent bores may be readily and conveniently formed and the bores shut off in leakproof fashion from the cut away edge portion of the plate, by fitting in suitable closure members, partially filling the cut away portions and then suitably securing the closure members to the plate.

The procedure is very simple and the operations of such a character as to enable the plate or platen to be produced in large quantities at comparatively small expense.

In the particular form shown, the inlet for the temperature controlling fluid enters one of the end bores 19 at the side, as shown, for example, at 25, the extremity of such bore adjacent such inlet being closed by a suitable screw threaded plug 26. The outlet 27 may be provided in a similar relation to the bore 19 at the opposite end of the plate, such last named bore being closed at its extremity by a similar screw threaded plug 28. Considerable variation may be made, however, in such details, without digressing from my inventive idea as set forth in the claims.

It will be obvious that so far as the method of manufacture is concerned, the sequence of the steps, as herein described, may be somewhat varied as, for example, by cutting the edge of the plate to form lateral recesses or notches, prior to the drilling of the bores which connect with the short communicating passages to create a long sinuous duct. It will be obvious, furthermore, that in the broad aspects of the in-

vention, I do not limit myself to a construction in which the edge of the plate is cut away at a plurality of spaced locations, because at some stage of the process, the edgewise cuts might communicate with each other, provided such communication were subsequently cut off in a suitable manner, and even this procedure might be unnecessary in all cases, provided the hollow platen were so constructed as to be substantially fluid-tight, when finished, at those places where it is desirable to have it so.

What I claim is:

1. A platen for presses and the like, adapted to be heated or cooled by an interiorly circulating fluid, and composed of a rolled steel plate having a plurality of suitably interconnected drilled bores, forming a sinuous duct, the passages interconnecting adjacent bores being formed by recesses cut through opposite edges of the plate, but shut off from the exterior of the plate, and said bores terminated at said passages.

2. A platen for the purpose described, comprising a comparatively thin plate having a plurality of substantially parallel bores drilled therein substantially across the width of the plate, the opposite edges of the plate being recessed from the surface thereof to form interconnecting passages between adjacent bores at the extreme ends thereof, and means to close the mouths of the recesses.

3. A platen for the purpose described, comprising a comparatively thin plate having a plurality of substantially parallel bores drilled therein substantially across the width of the plate, and the metal of said plate, at the edges thereof, being cut away to form interconnecting passages between adjacent bores, and means for cutting off said passages from the exterior of the plate, said bores and passages forming in conjunction, a single, long, circuitous passage for a temperature controlling fluid.

4. A platen for the purpose described, comprising a plate having a plurality of parallel bores extending substantially across the same, the opposite edges of the plate being recessed from the surface thereof, the ends of the adjacent bores terminating in the recesses so that interconnecting passages are created therebetween, and means for closing the mouths of said recesses.

5. A platen for the purpose described, comprising a plate having a pair of bores extending substantially to one edge thereof, the edge of said plate being cut away to form a passage interconnecting said bores in a transverse direction, and means located within a portion of the cut away part of the plate to close off the bores and the interconnecting passage from the exterior of the plate.

6. A platen for the purpose described comprising a plate, having a pair of bores extending substantially to one edge thereof, said plate being cut away to form a passage interconnecting said bores in a transverse direction, and means located within a portion of the cut away part of the plate to close off the bores and the interconnecting passage from the exterior of the plate, said means comprising a metal strip suitably secured in the cut away part.

7. A platen for the purpose described, comprising a plate, having a pair of bores extending substantially to one edge thereof, said plate being cut away to form a passage interconnecting said bores in a transverse direction, and means located within a portion of the cut away part of the plate to cut off the bores and the interconnecting passage from the exterior of the plate, said last named means comprising a metal strip welded to the plate in the cut away part thereof.

8. A metal plate having a plurality of drilled bores extending across the same, said plate cut away at opposite edges to form passages interconnecting certain adjacent bores, and metallic members set in said cut away portions at the edges of the plate and welded therein.

9. A metal plate having a plurality of substantially parallel bores drilled therein substantially across the width of the plate, the edge portions of the plate between adjacent bores being cut away to form interconnecting passages, and means to cover said passages to close them off from the exterior of the plate.

10. A metal plate having a groove in the edge thereof, drilled bores communicating therewith, a closure strip set in said groove, said groove and strip being so formed as to present in conjunction a wedge shaped recess, and welding material filling said recess and securing the strip to the plate.

11. A metal plate having a plurality of substantially parallel bores drilled therein substantially across the width of the plate, the edge portions of the plate being cut away to form interconnecting passages, and metal strips set in the cut away portions substantially flush with the corresponding edges of the plate and secured thereto.

12. The method of making a platen or the like, which comprises drilling in a suitable plate a plurality of substantially parallel bores extending across the same, cutting away the metal between certain adjacent bores to form connecting passages and then partially filling the cut away portions.

13. The method of making a plate having a circuitous passage in the plane thereof, which comprises boring a plate with a plurality of parallel bores extending across the same, notching the plate at the edges thereof

with notches of less thickness than the plate, between the adjacent ends of certain bores, and then filling the mouths of the notches.

14. The method of making a metal plate having a circuitous passage in the plane thereof, which comprises boring a plate with a plurality of parallel bores extending across the same, grooving opposite edges of the plate to form connecting passages and then partially filling the grooves.

15. The method of making a plate such as described, which comprises drilling a plate with a plurality of parallel bores extending across the same, cutting into the edges of the plate between the adjacent ends of certain bores to provide notches communicating with adjacent bores, and then suitably filling the mouths of the notches.

16. The method of making a plate such as described, which comprises drilling a plate with a plurality of parallel bores extending across the same, cutting into the edges of the plate between the adjacent ends of certain bores to provide notches communicating with adjacent bores, and then welding closure members in the mouths of the notches.

17. The method of making a plate such as described, which comprises drilling a plate to form bores extending substantially to an edge of the plate, cutting away the edge portion to connect the bores, and partially filling the cut away edge portion.

18. The method of making a steamheated platen or similar article, which comprises boring a plate with a pair of bores, cutting away the plate to form a recess connecting said bores, and then welding a closure member in the mouth of the recess.

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

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

21. A platen for presses or the like, adapted to be heated or cooled by an interiorly circulating fluid, said platen comprising a plate provided with a plurality of drilled bores having their ends terminating in recesses at the edges of the plate and means for closing the mouths of said recesses.

22. A platen for presses or the like, adapted to be heated or cooled by an interiorly circulating fluid, said platen comprising a plate provided with a plurality of drilled bores, said bores being suitably interconnected by cut away edge portions of the plate, and means for closing off said cut away portions from the edge of the plate.

23. A metal plate having a plurality of drilled bores extending across the same, the metal between said bores being cut away at the edges of the plate to form interconnecting passages, and means for covering said passages and the ends of the adjacent bores to form a sinuous duct through the plate closed off from the edges thereof.

In witness whereof, I have hereunto set my hand on the 4th day of March, 1922.

J. FRANK NORTH.