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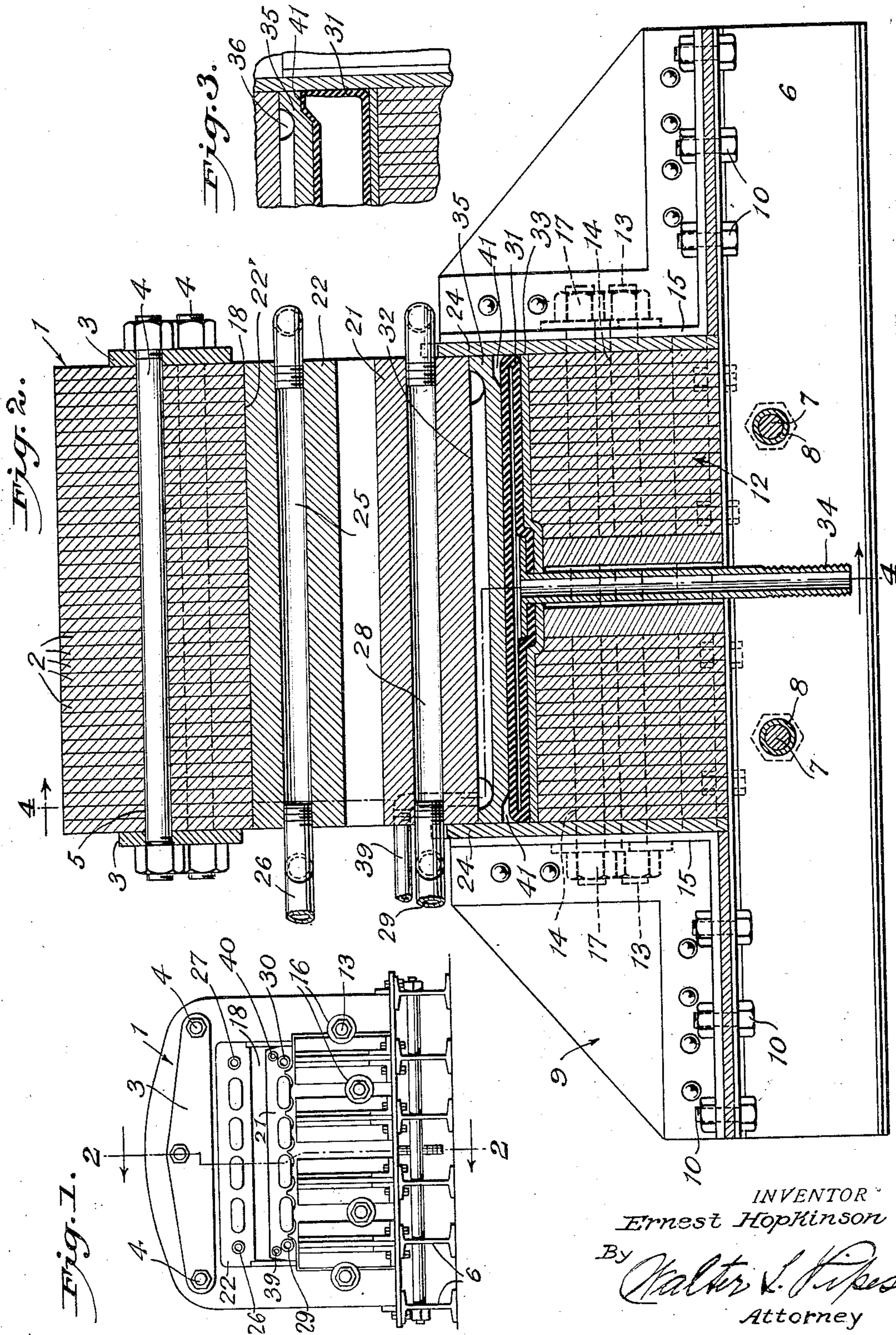
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1,777,310

PRESS

Filed March 7, 1928

2 Sheets-Sheet 1



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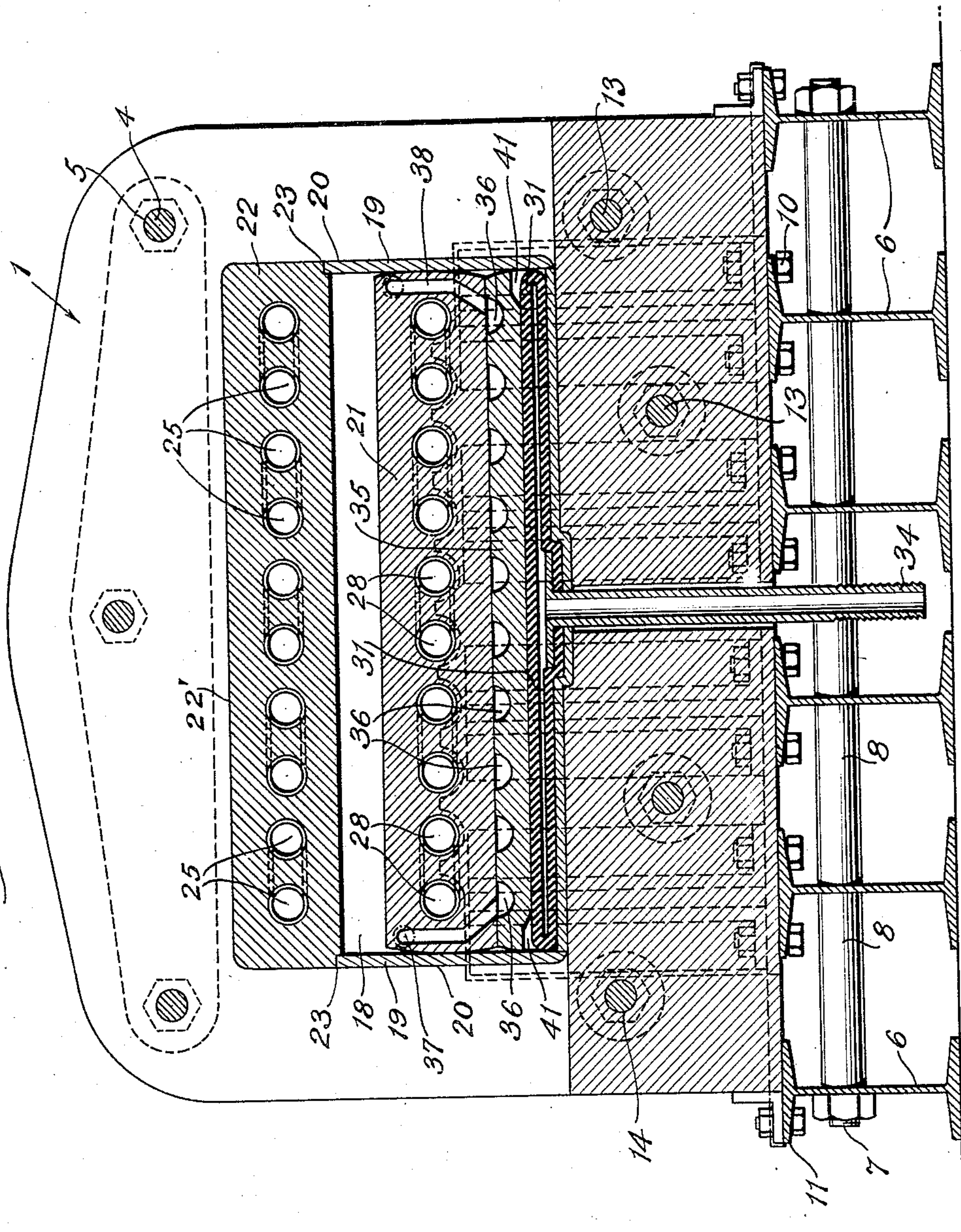
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Fig. 4.



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UNITED STATES PATENT OFFICE

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PRESS

Application filed March 7, 1928. Serial No. 259,685.

This invention is concerned generally with presses and particularly to a high-pressure hydraulic vulcanizing press for vulcanizing belts, sheet packing, rubber matting or other similar long or flat articles.

Heretofore the moving platens of vulcanizing presses were actuated by hydraulic pressure under a ram depending upon some application of a stuffing box to retain the pressure fluid, and the ram operating pressure was usually high as compared with the compacting effect at the platen surface, due to the relatively small area of the ram as compared with the pressing area of the platen.

One object of this invention is to provide means for applying the motive fluid beneath the entire effective area of the platen, thereby obtaining a very high compressing effect at ordinary fluid pressures and a more uniform compacting of the work within the press. For accomplishing this purpose, there is preferably provided beneath a movable platen an expansible container in the form of a rubber bag or envelope of a size coextensive with the entire pressing area of the platen and normally collapsed to permit introduction of the work between the pressing jaws. Means are provided for admitting pressure fluid to the bag whereby to dilate the same and thereby actuate the platen.

Another object is to dispense with stuffing boxes and to establish a cooling zone between the heated platens and the fluid actuated bag to protect the latter from the destructive action of heat. A further object is to obviate jamming or pinching of the expansible bag at the sides of the platen during expansion or return thereof to non-pressing position. Any number of platens may be provided with the actuating bags, for instance, two opposed platens may be each provided with bags and operated simultaneously to meet at a common point. Or the platens may be constructed in gang formation and all operated simul-

taneously by a suitable installation of the actuating bags, as will be readily understood.

Other novel features and advantages will appear as the description proceeds.

In the accompanying drawings:

Fig. 1 is an end elevation of a vulcanizing press illustrating one practical embodiment of my invention;

Fig. 2 is a vertical section on the line 2—2 of Fig. 1;

Fig. 3 is a fragmental detail of the expanded actuating bag and adjacent portions of the press; and

Fig. 4 is a transverse section on the line 4—4 of Fig. 2.

Referring to the drawings, the reference character 1 represents generally a frame which may be in one piece or built up of a plurality of laminated plates 2 held together adjacent their upper portions by means of clamping straps 3 and suitable bolts 4 which extend through perforations 5 in the plates 2 in a manner to draw them tightly together to form a solid unit. The frame 1 may rest upon a plurality of I-beams 6 which are preferably all secured together by cross bolts 7 and spaced by sleeves 8. Angle braces 9 are bolted as indicated at 10 to the upper flanges 11 of the I-beams 6 and are also secured to the lower portion 12 of the laminated plates 2 of the frame 1 by means of cross bolts 13 which pass through suitable perforations 14 in the portion 12 and are drawn up tightly against vertical flanges 15 of the angle braces 9, suitable washers 16 being preferably provided between the flanges 15 and nuts 17 at both ends of the cross bolts 13.

The frame 1 has an opening 18 there-through adjacent its central portion and a pair of oppositely disposed plates 19 extend crosswise through the opening 18 and against the inner walls 20 thereof to provide a guide for a movable platen, designated 21. An upper platen 22 may be conveniently supported as indicated at 23 upon the top edges of the

plates 19 and backed by the top wall 22' formed by the opening 18. For further aiding in guiding the movable platen 21, there is provided a pair of oppositely disposed plates 24 which are interposed between the flanges 15 and the lower portion 12 of the frame 1. These plates 19 and 24 form a rectangular pocket in which the platen 21 may slide up or down with respect to the stationary platen 22.

Various kinds of flat or long articles may be placed between the platens 21 and 22 and then the platen 21 actuated to compress or compact the article by applying pressure to the platen 21. For heating the platens to accomplish the desired vulcanization of the compressed article, there is provided a series of channels 25 extending through the stationary platen 22, the channels being preferably connected in series and having a supply pipe 26 and an exhaust pipe 27. The lower or movable platen 21 is similarly provided with channels designated 28 and may be equipped with a supply pipe 29 and an exhaust pipe 30. In order to move the platen 21 toward the platen 22 to effect compression and vulcanization of an article, there is preferably provided a rubber bag or container 31 which is disposed between the bottom or under surface 32 of the platen 21 and a plate 33 which rests upon the bottom of the opening 18 in the frame 1, a combined supply and exhaust port 34 being secured to the bag 31 in any suitable manner.

In order to protect the rubber bag 31 from the destructive action of heat arising from the heated platens 21 and 22, there is provided between the platen 21 and the bag 31 a heat insulating shield 35 having cooling channels or grooves 36 which are suitably connected together in series for the continuous flow of a cooling liquid which is arranged to be led to the channels through a passage 37 in the movable platen 21 and exhausted through a similar passage 38 on the opposite side of the platen 21. A pipe 39 supplies the channel 37 with the cooling liquid and a similar pipe 40 on the opposite side conveys the exhaust cooling fluid away from the press.

Upon admission of a suitable pressure fluid into the port 34, the bag 31 dilates against the bottom of the shield 35 and thereby lifts the movable platen 21 to press the article firmly against the stationary platen 22.

Upon release of the pressure, the platen 21 and its shield 35 drop by gravity to normal non-pressing position as indicated in Fig. 2. Any tendency of the bag 31 to become jammed or wedged at the corner formed by the bottom edge of the shield 35 and the inner walls of the plates 20 and 24 is overcome by cutting away or forming the bottom outer edges of the shield 35 so as to provide a peripheral recess 41. As the rubber bag 31 expands to project the platen 21 upward,

the portions of the bag adjacent the peripheral recess 41 stretch upward into said recess 41 under greater tension than the other parts of the bag, so that, when the fluid pressure is released to permit the platen 21 to fall to normal position, the tension of the rubber at the side edges of the bag projecting into the recesses 41 causes the bag to rapidly contract at these portions and thereby pull away from said corner.

It is not intended to limit the invention to the exact embodiment described as it is obvious that the upper platen 22 may be operated by a rubber bag in a similar manner to the platen 21, and also, that any other combination of platens may be equipped with actuating bags and operated in the same manner.

Having thus described my invention, what I claim and desire to protect by Letters Patent is:

1. A vulcanizing press having cooperating platens, an expansible bag substantially co-extensive with one of said platens, means for supplying and removing fluid under pressure from said bag, and means for preventing pinching of the margins of said expansible bag during operation of the press.

2. A press including a stationary platen, a movable platen, an expansible container arranged to receive fluid under pressure and to expand against said movable platen whereby to move the same toward the stationary platen, means for heating the platens, and means for heat-insulating said container from said platens.

3. A press including a stationary platen, a movable platen, a stationary part, a rubber bag disposed between said stationary part and the movable platen, means for heating the platens, a cooling element arranged to shield said bag from the heated platens, and means for introducing fluid under pressure into said bag to cause expansion thereof against the stationary part and the cooling element, whereby to move the latter and said movable platen toward the stationary platen.

4. A press including a stationary platen, a movable platen, a base, a pocket within the base for receiving and guiding said movable platen, both of the platens having a series of heating passages, a rubber bag or container disposed against the wall of said pocket opposite to the movable platen, a heat-insulating element having a series of cooling channels interposing said bag and said movable platen, and means for introducing fluid under pressure into said bag whereby to cause said movable platen and the said cooling element to move toward the stationary element.

5. A press including a stationary platen, a movable platen, a base, a pocket within the base, said pocket having walls arranged to guide said movable platen, both of the

platens having heating passages, a rubber
container between said movable platen and
the bottom of the pocket, a heat-insulating
element in the form of a plate having cooling
5 channels disposed between the under surface
of said movable platen and the container, said
element being also guided by the pocket walls,
means for introducing fluid under pressure
into said rubber container to cause move-
10 ment of said element and the movable platen
toward the stationary platen, and means for
preventing jamming of said container be-
tween the outer edges of said cooling ele-
ment and the walls of said pocket.

15 Signed at New York, county and State of
New York this 3rd day of March, 1928.
ERNEST HOPKINSON.

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