

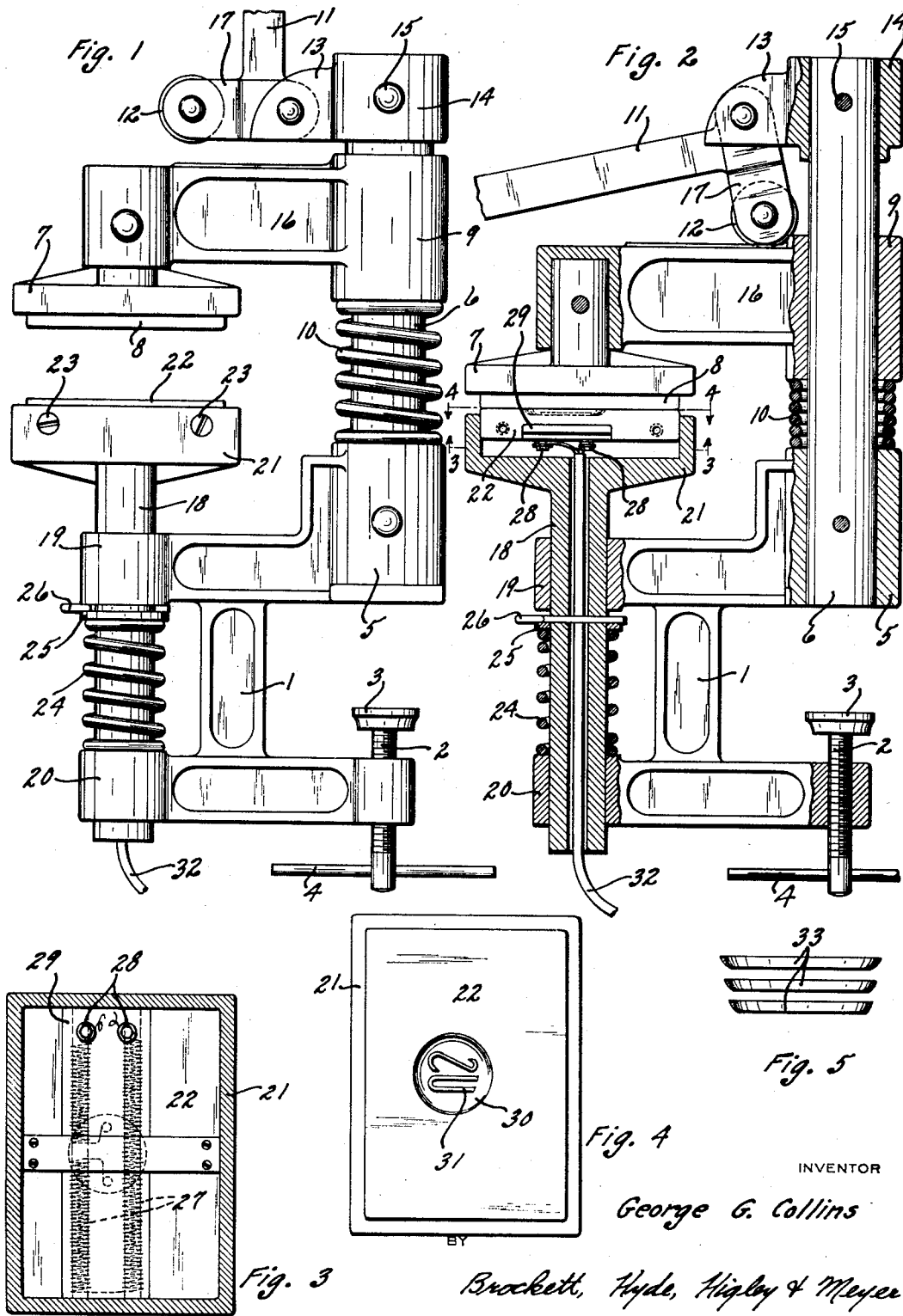
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TUBE PRESS

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TUBE PRESS

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My invention relates to a tube press as used for repairing punctures or abrasions in inner tubes for automobile tires. By tube press is meant an apparatus for compressing a patch on a puncture or abrasion in an inner tube and then heat treating the patch and tube to cause the patch to adhere to the inner tube for effectively closing the puncture or abrasion therein, whereby the tube may be inflated with air so that, together with the outer casing or tire, it will support a vehicle. Heretofore, the necessary pressure exerted on the patch and inner tube to effectively press them together during heat treatment has been variable in proportion to the ability of the human element to vary inasmuch as the pressure exerting member has been loosely mounted on one end of a threaded shaft movable longitudinally by rotation. The pressure exerted on the patch and tube were seldom the same in any two operations. Further, the curing plate forming a part of such apparatus has, as a rule, been smooth which permitted movement of the patch relative to the tube before pressure was exerted thereon.

It is one object of my invention to provide a simply constructed tube press for the purpose of pressing an inner tube and patch together and heat treating the patch and tube to cause the patch to adhere to an inner tube, embodying a minimum number of parts and yet of a nature to cause a substantially like pressure to be exerted on each patch and tube, together with a locking means for locking the curing plate and clamping plate of the apparatus in such pressure applying positions.

Another object of my invention is to provide a curing plate for the apparatus having a patch receiving depression therein or other means such as indentations or series of indentations thereon which will avoid possible slippage of the patch relative to the tube prior to and while pressure is being exerted thereon; and to provide a means in the apparatus for marking the patches for identification purposes, for instance, where or/and by whom the patch was applied or the manufacturer of the patch, this being accomplished by a depression or depressions in the curing plate and suitable indicia in such depression.

Various other objects and advantageous features of my invention will be seen in the following description and one embodiment thereof may be seen in the accompanying drawing wherein similar characters of reference designate corresponding parts, and wherein:

Fig. 1 is a side elevation of the tube press con-

structed in accordance with my invention; Fig. 2 is a view of the press shown in Fig. 1 with parts in section; Fig. 3 is a sectional view taken on the line 3—3 of Fig. 2 and looking upwardly; Fig. 4 is a view taken on the line 4—4 of Fig. 2 and looking downwardly; and Fig. 5 is a view showing a plurality of sizing rings that may be used for varying the size of the depression in the curing plate that is adapted to receive the patch to be applied to the inner tube.

Referring to the drawing, I have shown a tube press constructed in accordance with my invention embodying a frame 1 having a means thereon including a screw 2 carrying a head 3 and a handle 4 for clamping the tube press upon a suitable support, for instance, a work bench, by clamping the edge of the support between the head 3 and a part of the frame 1, this being accomplished by turning the screw 2.

In accordance with my invention, the frame 1 is provided with a sleeve 5 adapted to receive one end of an upstanding rod 6. This rod 6 carries the upper head 7 of the tube press, the head including the usual insulating plate 8, and the head 7 being slidable on the rod 6 by being carried on a sleeve 9 mounted on the rod 6. An expanding spring 10 is disposed between the lower end of the sleeve 9 and the upper end of the sleeve 5 and surrounding the rod 6 to normally maintain the sleeve 9 and head 7 in their uppermost positions shown in Fig. 1 and to resist downward movement of the head and sleeve.

Suitable means are provided for moving the head 7 downwardly against the resistance of the spring 10 and, as shown, this means comprises a lever 11 having a roller 12 mounted on one end thereof, the lever being pivotally mounted on an ear 13 extending outwardly from a cap 14 rigidly mounted on the uppermost end of the rod 6, as by means of the rivet 15. As will be readily apparent from viewing Fig. 2, movement of the lever 11 downwardly will result in the roller 12 contacting with and riding on the head carrying arm 16, extending outwardly from the sleeve 9 and carrying the head 7, to cam the head 7 downwardly by forcing the sleeve 9 downwardly on the rod 6 and compressing the spring 10. It will also be apparent that complete downward movement of the lever 11 will result in the arm 17, carrying the roller 12, passing the vertical center line of the pivot between the lever 11 and the ear 13 whereby the sleeve 9 and head 7 will be locked in its downwardmost position and the spring 10 will be held compressed.

Also, in accordance with my invention, a tube-

lar rod 18 is slidably mounted in spaced sleeves 19 and 20 formed in the frame 1 as shown in Figs. 1 and 2 and the uppermost end of this tubular rod takes the form of a support 21 adapted to receive the curing plate 22 of the apparatus, the curing plate being removably mounted in the support 21 as by means of screws 23. To maintain this curing plate in its uppermost position by holding the tubular rod 18 upwardly, a compression spring 24 surrounds the tubular rod 18 and is disposed between the sleeves 19 and 20 with one of its ends bearing against the upper surface of the sleeve 20 and its opposing end bearing against a washer 25 on the rod 18, the washer being held in place by means of a cotter key or pin 26 extending through the tubular rod. Thus, the curing plate 22 is resiliently held in its uppermost position.

The curing plate 22 may be provided with any suitable type of heating unit. As shown, the heating unit for the curing plate embodies resistance wires 27 leading from connectors 28, the resistance wires being interconnected together and one of the wires leading to and from a resistance element 29 that forms a hot spot at substantially the center of the curing plate or at the point at which the tube patch is normally disposed. However, any suitable type of heating element may be used.

Referring to Figs. 2 and 4, the upper surface of the curing plate 22 is provided with a depression 30 that, in this instance, is annular but may take any desired form and the bottom of this depression 30 is provided with any desired indicia 31. This indicia may provide a means for advertising or for indicating where or where and by whom the patch was applied to the tube. The depression may be of a standard size to receive a standard sized patch but should it be desired to use a smaller patch, suitable rings 33 are provided adapted to fit within the depression 30 and of such size that one ring will fit within another as shown by the dotted lines in Fig. 2 to decrease the size of the patch receiving depression 30 to any desired extent.

In the operation of this apparatus, it being understood that the patch receiving depression 30 is provided with the desired indicia, a patch is placed within the depression 30, an inner tube is placed on the curing plate 22 with the puncture or abrasion therein over the patch, and the handle 11 is moved to the position shown in Fig. 2 to bring the insulating plate 8 downwardly as here-

inbefore described and into engagement with the upper side of the inner tube and thereby create a pressure on the inner tube and patch to prevent slippage thereof and place them under the proper pressure for subjection to heat. It will be understood that the compression springs 10 and 24 are preferably of substantially the same strength or of such relative strength that substantially the same pressure will be exerted on each tube and patch placed in the apparatus.

Then, electrical current is supplied to the heating element hereinbefore described by way of the wire 32 extending upwardly through the center of the tubular rod 18 to the heating element whereby the entire curing plate and particularly the point directly below the depression 30 will become heated to cause a softening of the patch and its adhesion to the inner tube to close the puncture or abrasion. Such softening of the patch and the pressure exerted on the tube and patch will cause the indicia in the depression 30 to be transferred to and fixed in the patch. Of course, it is understood that the insulating plate is maintained in pressure applying relation with the curing plate 2 by the locking means hereinbefore described for the proper length of time to cause complete adhesion of the patch to the inner tube. After such operation, the handle 11 is moved upwardly whereby the plates 8 and 22 will be separated by action of the springs 10 and 24 and the tube and patch attached thereto may be removed.

What I claim is:

1. A vulcanizer curing plate having a patch-receiving recess, and an insert for said recess adapted to fit peripherally therein to reduce the effective patch-receiving size thereof.

2. A vulcanizer curing plate having a patch-receiving recess, and an insert for said recess adapted to fit peripherally therein to reduce the effective patch-receiving area thereof, with a through opening permitting direct contact between the bottom of said recess and the bottom of a patch in said insert.

3. A vulcanizer curing plate having a patch-receiving recess, and a set of inserts for said recess, the largest insert being adapted to fit peripherally in the recess to reduce the effective patch-receiving size thereof, and each other insert being adapted to similarly fit in the next larger insert, whereby said patch-receiving size may be adjusted by removal or use of the proper inserts of the set.

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