June 29 , 1926. 1,590,377

F. L. JOHNSON

TIRE VULCANIZING MOLD

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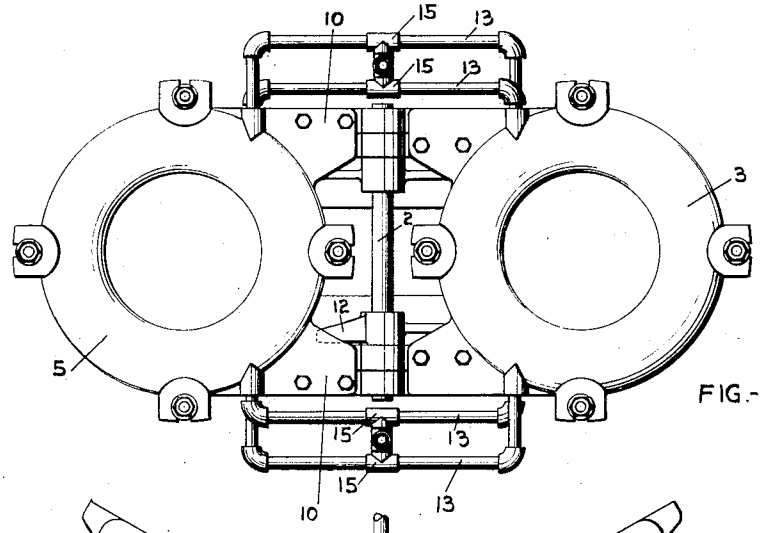


FIG.-1.

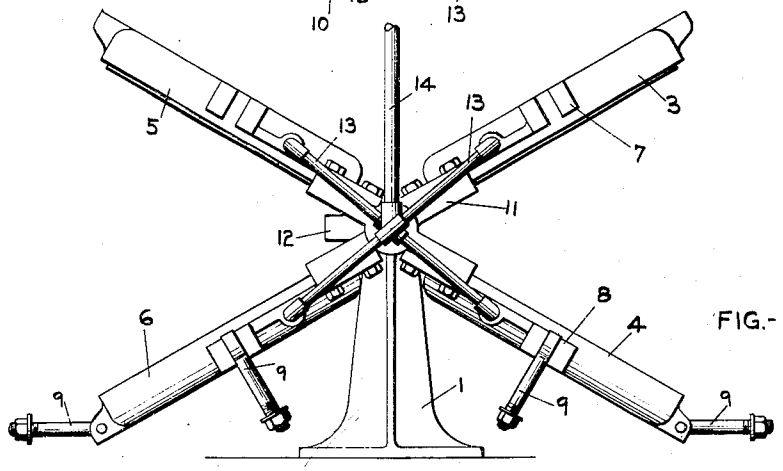


FIG.-2.

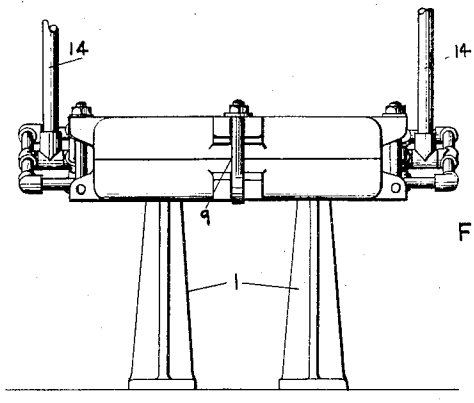


FIG.-3.

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FIG. 4.

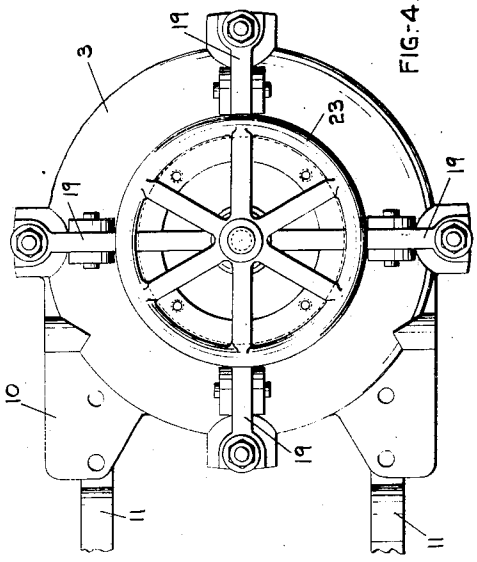


FIG. 5.

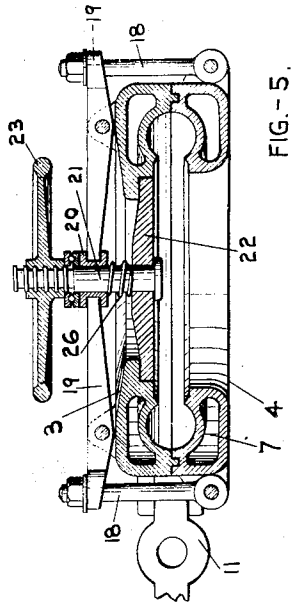


FIG. 6.

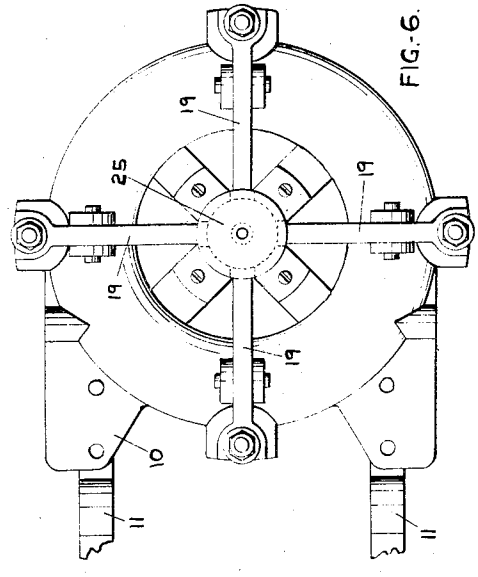
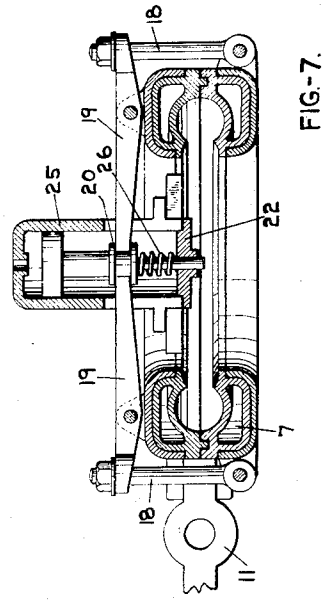


FIG. 7.



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UNITED STATES PATENT OFFICE.

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TIRE-VULCANIZING MOLD.

Application filed August 29, 1925. Serial No. 53,304.

This invention relates to apparatus for vulcanizing tires or other rubber articles which utilizes the principles of swinging or hinged molds which are steam jacketed so that the articles may be cured, thus securing economical production. The object of the invention is to improve upon the construction of devices of this character as will be apparent from the description and drawings.

It will be understood that changes and modifications may be made in the details of the device, and such changes and modifications as fall within the scope of the claims are intended to be covered herein.

In the drawings:

Figure 1 is a plan view of an improved form of mold such as is used in the vulcanization of tires, embodying the features of the invention;

Figure 2 is a side elevation with the mold opened;

Figure 3 is a side view at right angles to Figure 1, showing the mold closed;

Figures 4 and 5 are a plan and section, respectively, of the mold, showing a quick action locking device applied thereto; and

Figures 6 and 7 are similar views showing a modification of the locking device.

The apparatus of the present invention comprises a double mold construction, the mold halves or sections on either side of the apparatus being counterbalanced and mounted upon a common horizontal axis so that the operation of opening and closing the molds may be accomplished easily and quickly.

The device comprises parallel uprights or standards 1 in the upper portion of which is secured a shaft 2 which forms the common horizontal axis for the molds.

The molds are arranged in pairs upon either side of the axis, the right hand mold consisting of upper and lower sections or halves 3 and 4, and the left hand mold consisting of upper and lower sections or halves 5 and 6. These sections are preferably chambered or hollow as shown in Figures 4 and 5, the cavities 7 therein affording chambers for the circulation of steam. In the form shown in Figures 1 to 3, the mold sections are formed with parallel lugs or ears 8 provided with pivoted bolts 9 which secure the mold sections together.

Each mold section is provided with ears or lugs 10 which are bolted to arms 11 pivoted upon the shaft 2. The arms 11 are arranged in two pairs upon either side of the apparatus and extend upon either side of the axis 2, the upper half of one mold and the lower half of the other being secured upon the same arms. Thus the mold sections 3 and 6 are rigidly connected together and the mold sections 4 and 5 are connected together so that each mold section is counterbalanced. In this manner, the mold sections may be brought together with the exercise of very little exertion on the part of the operator. A stop 12 is located between the mold sections so that when they are clamped together, the molds remain in horizontal position.

The mold halves upon either side of the apparatus are connected together by rigid pipes 13 upon both sides, the pipes upon one side being for the admission of steam to the chambered molds, and the pipes at the other side being for drainage. These pipes are connected to main line pipes 14 by swivelled joints 15, thus affording a flexible connection for the molds.

In the operation of the apparatus, the molds being open as shown in Figure 2, the tires, together with the cores, air bags or curing rings are laid in the cavities in the sections 4 and 6. These sections are then raised, lowering the sections 3 and 5, and the molds are clamped together. The ease and simplicity of operation are apparent to those skilled in the art. Different sizes of molds may be secured to the swinging arms and the device is economical and efficient. While the device is shown as arranged for the curing of tires, it is apparent that tubes can be cured in the same way, or molds for other articles may be substituted.

Modifications of the clamping mechanism are shown in Figures 4 to 7 inclusive, which are designed as quick acting clamps.

In Figures 4 and 5, the pivoted bolts 18 carried upon the lower sections are received within the forked ends of pivoted levers 19 which are rocked upon the upper mold sections. The levers 19 are arranged radially of the mold and their inner ends are received within the flanges of a collar 20 which slides upon a vertical shaft 21. This shaft is carried on a plate 22 arranged at the center of the mold, and the collar is forced inwardly upon the shaft by a hand wheel 23 screwed upon the outer end

of the shaft 21. As the hand wheel 23 is moved downwardly upon the shaft, the levers 19 rock simultaneously and draw the two halves of the mold together.

A further modification shown in Figures 6 and 7 uses as a substitute for the hand wheel, a fluid operated cylinder 25. In both modifications, there is a coil spring 26 below the collar 20 which forces the collar upwardly when the pressure is released.

What is claimed is:

1. An apparatus for the vulcanization of rubber articles, comprising two mold units each comprising separable sections, a common pivot for the mold units, and a rigid connection between two sections of the mold units.

2. An apparatus for the vulcanization of rubber articles, comprising two mold units each comprising upper and lower sections, a common horizontal pivot for the mold units, and a rigid connection between two sections of the mold units so that the lower section of one unit is counterbalanced by the upper section of the other.

3. An apparatus for the vulcanization of rubber articles, comprising a horizontal shaft, rigid arms centrally pivoted upon the shaft and extending upon either side thereof, and mold sections attached to the arms.

4. An apparatus for the vulcanization of rubber articles, comprising two mold units, each comprising upper and lower chambered sections, a common horizontal pivot for the mold units, a rigid connection between two sections of the mold units so that the lower section of one unit is counterbalanced by the upper section of the other, inlet and discharge pipes and flexible connections from the pipes to the interior of the chambered molds.

5. An apparatus for the vulcanization of tires, comprising two mold units, each comprising two sections, a common pivot located between the mold units, and a connection between a section of one unit and a section of the other unit, whereby the opening or closing of one mold will open and close the other.

6. An apparatus for the vulcanization of tires, comprising two mold units, each comprising upper and lower chambered sections, a common horizontal pivot located between the units, a rigid connection between the upper sections of one mold and the lower section of the other, whereby the said sections are counterbalanced, and flexible steam connections for the sections.

7. A locking mechanism for molds, comprising two sections, a plurality of bolts attached to one section, a plurality of levers pivoted upon the other sections adapted to be connected with the bolts, and a common actuating member for rocking said levers simultaneously.

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