No. 766,194. PATENTED AUG. 2, 1904.

F. S. ORNSTIEN.

APPARATUS FOR USE IN THE MANUFACTURE OF WHEEL TIRE COVERS.

APPLICATION FILED FEB. 24, 1903. RENEWED APR. 5, 1904.

NO MODEL. 3 SHEETS-SHEET 1.

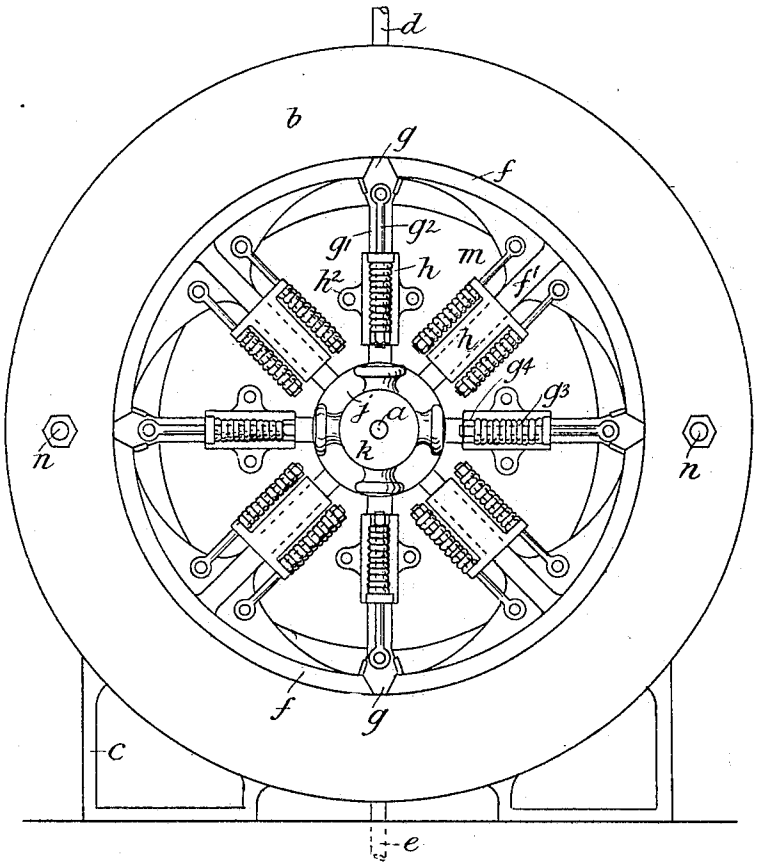


Fig. 1.

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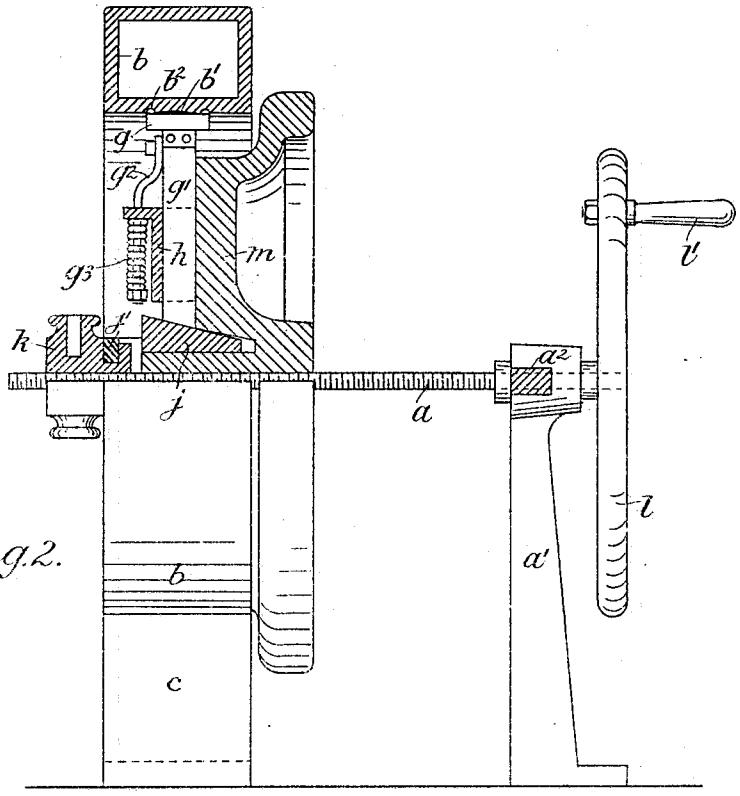


Fig. 2.

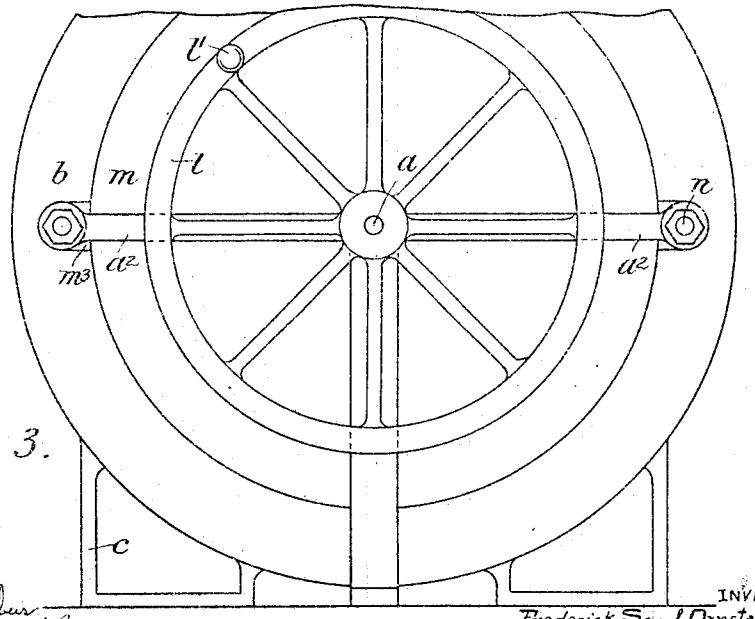


Fig. 3.

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APPARATUS FOR USE IN THE MANUFACTURE OF WHEEL TIRE COVERS.

APPLICATION FILED FEB. 24, 1903. RENEWED APR. 6, 1904.

NO MODEL. 3 SHEETS—SHEET 3.

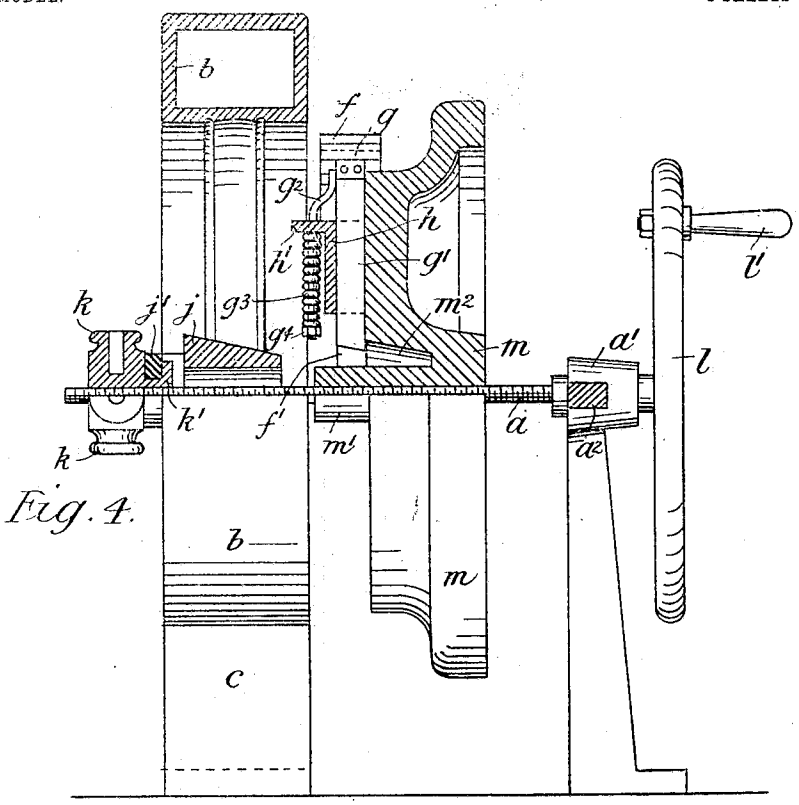


Fig. 4.

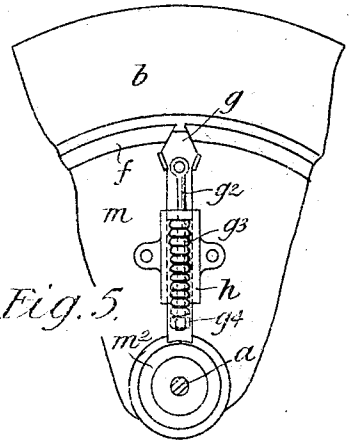


Fig. 5.

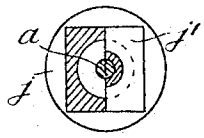


Fig. 6.

WITNESSES

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No. 766,194. Patented August 2, 1904.

UNITED STATES PATENT OFFICE.

FREDERICK SAUL ORNSTIEN, OF KENSINGTON, VICTORIA, AUSTRALIA.

APPARATUS FOR USE IN THE MANUFACTURE OF WHEEL-TIRE COVERS.

SPECIFICATION forming part of Letters Patent No. 766,194, dated August 2, 1904.

Application filed February 24, 1903. Renewed April 5, 1904. Serial No. 201,743. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK SAUL ORNSTIEN, a subject of the King of Great Britain, residing at Macaulay Road, Kensington, in the State of Victoria, Australia, have invented certain new and useful Improvements in Apparatus to be Used in the Manufacture of Wheel-Tire Covers, of which the following is a specification.

This invention has been devised to provide certain improvements in or connected with apparatus to be used in the manufacture of covers for pneumatic and other flexible wheel-tires. The cover in this apparatus is subjected to heat and pressure, and the tire leaves the apparatus in a flattened form and is thus finished, except that it is to be afterward shaped into the round form to receive the pneumatic tube and to fit upon the wheel; but the rounding of the cover forms no part of the present invention.

In order that the invention may be clear, I will describe same with reference to the accompanying drawings.

Figure 1 shows a front elevation of the apparatus; Fig. 2, a side elevation, partly in section; Fig. 3, a back elevation in part; Fig. 4, a view corresponding with Fig. 2, but with parts in altered position. Fig. 5 shows presser-plates and wedge in position with pressure removed. Fig. 6 shows a front view of the cone and its frame, partly in section.

I employ a longitudinal central screw-threaded shaft *a*, preferably set horizontally, supported with suitable standard bearing or support *a'* and further supported as hereinafter described. This screw-shaft forms the center line of an annular case *b*, the latter being supported from some stanch base *c*. The annular casing is hollow and constitutes a steam-box, into which, preferably at its top, is led an inlet high-pressure steam-supply pipe *d*, provided with adjustable valve or cock and at its bottom with a pipe *e*, Fig. 1, leading to condensed-water box. The interior face of this annular casing is preferably provided with a neatly-turned concave surface at *b'*, having at either edge of the dished portion of this concave surface an annular groove b^2, sized and shaped for the reception of the wire forming the rim around the edge of the tire-cover. The object of the annular dishing is that the tire when compressed and vulcanized by the apparatus now being described may be thicker at its central line than near the edges where the wires are. As an alternative the grooves and dishing may be in the presser-plates hereinafter described.

Inside the casing *b* and constructed in conformity with the inner dished annulus above referred to are a series of presser-plates *f*, forming segments of a circle, of which the screw-shaft is the center. These presser-plates are preferably four in number and are accompanied by four other corresponding but shorter presser-plates *g* for filling in the peripheral gaps or spaces between the four larger ones. These smaller presser-plates are formed wedgewise, so as to engage with corresponding cut ends of the four larger presser-plates and to assist in forcing out the latter when their dilation is required. All of these curved presser-plates are provided with stanch shanks *f'* *g'*, (preferably square in section,) the latter passing through rigid bearing box or boxes *h*, provided with means for lubricating same, and proceed in toward the screwed shaft *a*, first hereinbefore referred to. The shanks of the longer presser-plates *f* are approximately about half an inch more than the shanks of the shorter or wedged-shaped presser-plates *g*, so that the latter may come into operation at a later period than the former.

The shanks have rods g^2 connected to them, and these rods pass through lugs *h'*, formed on the boxes *h*, and beneath said lugs the rods are encircled by spiral springs g^3, that are held in place by nut g^4, the object being to draw back the presser-plates when the pressure is removed. The boxes *h* have lugs h^2 and are bolted to a frame or back plate that is mounted on the screw-shaft *a*. This plate is of solid construction and has a projecting portion *m'* to enter a cone *j* and a conical recess m^2 to receive the cone. The wheel is supported at each side from rods *n*, that pass through lugs n^2. The rods bear in casing *b* and at back in arms a^2, projected from the bearing-standard *a'*.

The metal cone j is mounted upon the screw-shaft a and has a plain central cylindrical bore running through its length and is arranged to slide freely but firmly along the screw-shaft. In lieu of the cone a tapered block may be employed of octagonal or other shape to suit the number of shanks to be operated upon. Mounted upon the screw-shaft is a block-nut k with adjustable arms to enable the hand of the operator to turn such nut behind the cone or tapered block, so as to move same along the shaft a. The cone or tapered block has a recessed frame j', and the block-nut k has an extension k' entering same.

Fixed to the end of the screw-shaft and outside the standard-bearing thereof is mounted a hand-wheel l, provided with arms somewhat after the pattern of a marine rudder-wheel, or a handle l' for turning it to move back or forward the back plate m and the parts carried by it upon the screw-shaft a and the rods n.

In operation the strip of rubber and other material to be pressed and vulcanized (with its rim-wires in position) are laid inside the annulus hereinbefore mentioned at b', the rim-wires nestling in the annular grooves b^2. The back plate m will at this period be outside the casing b and the cone j, forward on the screw-shaft a, Fig. 4. The back plate will now be moved forward by turning the screw-rod a by means of the hand-wheel l. The presser-plates are then operated as follows: The cone j is passed through the inwardly-pointing ends of all the shanks f' g', the ends of these being cut away or curved to conveniently engage with the angle of the cone, the adjustable lock-nut k being screwed up along the shaft, so as to press against the cone and slightly force it between the ends of the shanks. This brings the presser-plates of the longer shanks f' into moderate engagement with the strip of rubber and other material forming the tire-cover. At this stage the shorter shanks g' are met by the increasing diameter of the cone in its forward movement. The nut k at the base of cone is revolved sufficiently to squeeze forward the four wedge-shaped presser-plates in their places, forming a complete annular presser-plate and tending to dilate the whole of the peripheral line formed by such plates. Further turning of the screw shaft or nut on same increases this pressure until the cover (which has been squeezed or strained into the dished plate) assumes the necessary sectional thickness.

Steam is turned into the casing b for a sufficient time and at a sufficient pressure or heat to cause the necessary vulcanizing action to take place. When the above operation has been satisfactorily performed, the cone is drawn out of engagement with the shanks and the springs come into operation to draw in the presser-plates, and thus release the pressure from the tire-cover. The large hand-wheel l or analogous appliance is now turned in the opposite direction to draw back the body m, and the vulcanized cover is then removed, being in a flattened form.

I would have it understood that I may cause the cone and back plate to be operated by any mechanical or hydraulic power other than that described.

The whole of the parts constituting my apparatus are preferably constructed of steel, but may be of other suitable metal or material.

The springs hereinbefore mentioned are set, preferably, in tension so as to exert a pull from the big or small plates toward the center of the machine; but I do not confine myself arbitrarily to the employment of a spiral spring for each of such shanks, and I may in some cases dispense with their use in connection with the shanks of the wedge-shaped presser-plates.

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

1. Apparatus to be used in the manufacture of wheel-tire covers—comprising, in combination, annular box, a series of presser-plates around the inside of said box with adjacent bevel edges, wedges for insertion between the said presser-plates, cone or tapered block for actuating the presser-plates and the wedges into and out of the gaps between the presser-plates and means for withdrawing the presser-plates and wedges from the annular box to allow of insertion and withdrawal of tire-cover, substantially as and for the purposes described.

2. Apparatus to be used in the manufacture of wheel-tire covers—comprising, in combination, annular box, a series of presser-plates around the inside of said box with adjacent bevel edges, wedges for insertion between the said presser-plates, such wedges and presser-plates being mounted upon shanks arranged to move in a frame and having bevel ends, a cone or tapered block mounted on screw-shaft for insertion between said shank ends and means for actuating the cone or block back and forward on the shaft, substantially as and for the purposes described.

3. Apparatus to be used in the manufacture of wheel-tire covers—comprising, in combination, annular box, a series of presser-plates around the inside of said box with adjacent bevel edges, wedges for insertion between the said presser-plates, such wedges and presser-plates being mounted upon shanks, a central screw-shaft supported on bearings, a back plate m carrying box h for the reception of the shanks, the shanks having beveled ends, a cone or tapered block mounted on screw-rod for insertion between such shank ends, a spring connection between the shanks and frame for returning the shanks against the action of the cone or tapered block, a recess in

the plate m to receive the cone or block, means for moving the back plate back and forward on the screw-rod and means for moving the cone or block back and forward into and out of engagement with the shanks, substantially as and for the purposes described.

4. Apparatus to be used in the manufacture of wheel-tire covers comprising, in combination, annular box b supported on base and having its interior face dished and with annular groove at each side of the dished portion, a series of presser-plates f around the inside of said box and with adjacent bevel edges, wedges g for insertion between the said presser-plates, such wedges being mounted upon shanks g', a central screw-shaft a supported on bearing a', a back plate m mounted on the shaft a, screw-rods n connected with the annular casing and with the plate m and bearing on arms a^2, the shanks having beveled ends, those of the presser-plates being longer than those of the wedges, a cone or tapered block mounted on screw-rod a for insertion between such shank ends, rods g^2 connected with shanks and springs g^3 on the rods engaging with the boxes h, a recess in the plate m to receive the cone or tapered block, a frame h' on the cone or tapered block and a block h on the screw-rod a engaging with the frame, whereby the cone or tapered block is moved back and forward on the screw-rod, a hand-wheel l on the screw-rod a to move back or forward the body m, substantially as and for the purposes described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FREDERICK SAUL ORNSTIEN.

Witnesses:
A. O. SACHSLLTI,
A. HARKER.