No. 677,142. Patented June 25, 1901.

S. T. RICHARDSON & R. PRICE.

APPARATUS FOR BENDING INTO CIRCULAR FORM METALLIC WHEEL RIMS

(No Model.) (Application filed May 3, 1898.) 3 Sheets—Sheet 1.

FIG 1

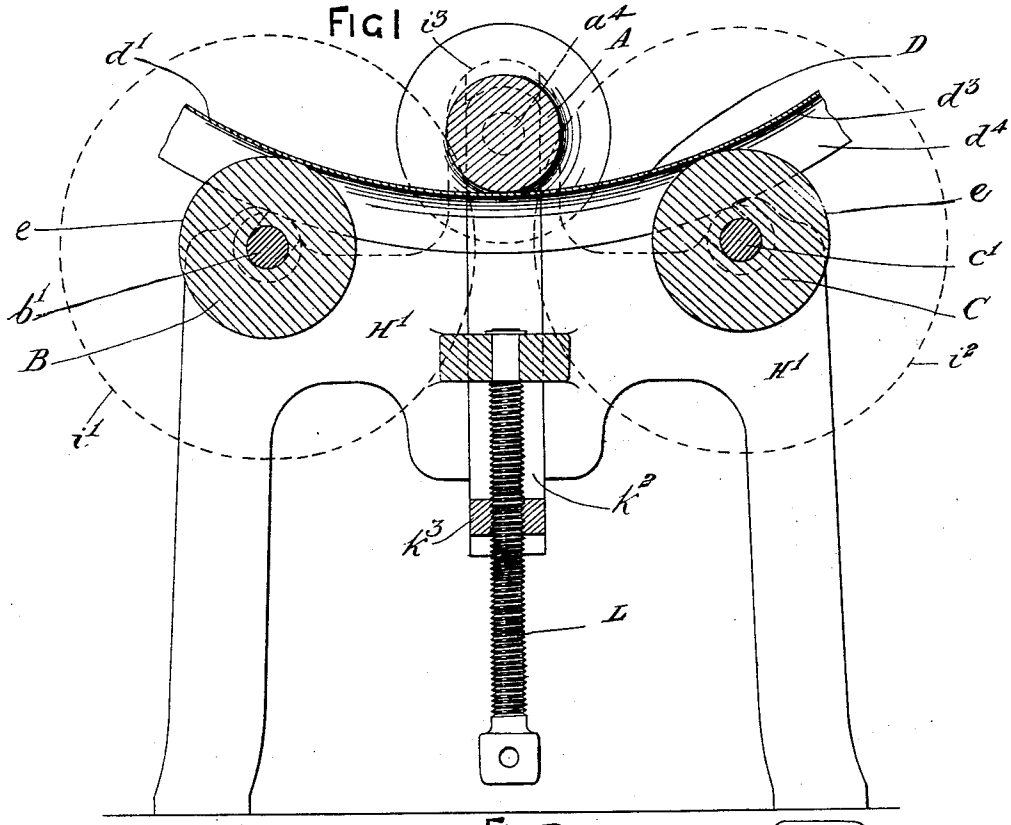
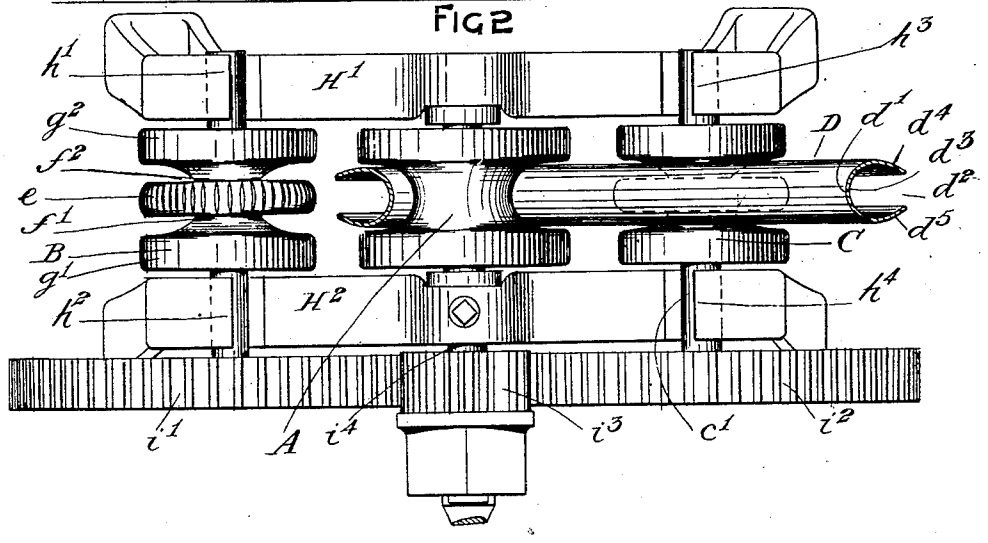


FIG 2



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FIG 3

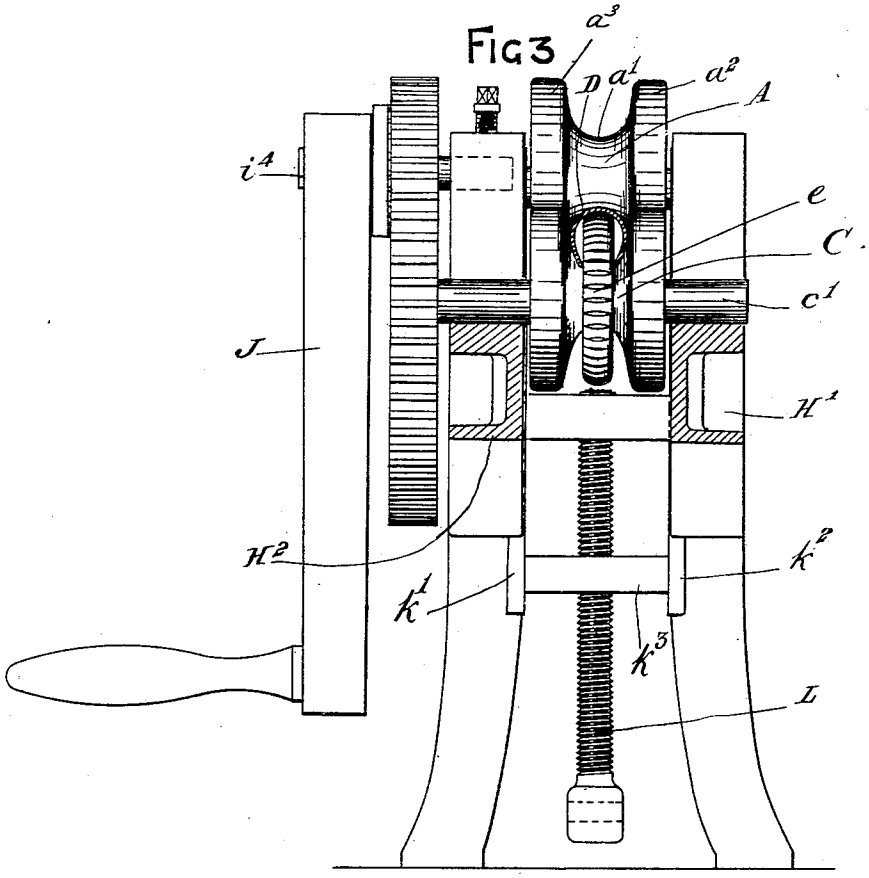
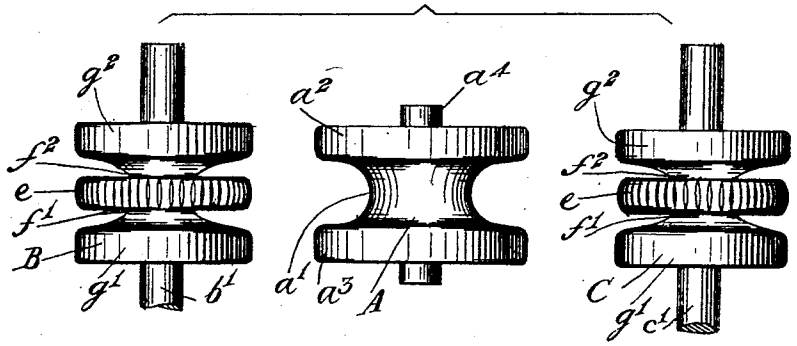


FIG 4



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(No Model.) (Application filed May 3, 1898.) 3 Sheets—Sheet 3

FIG 5

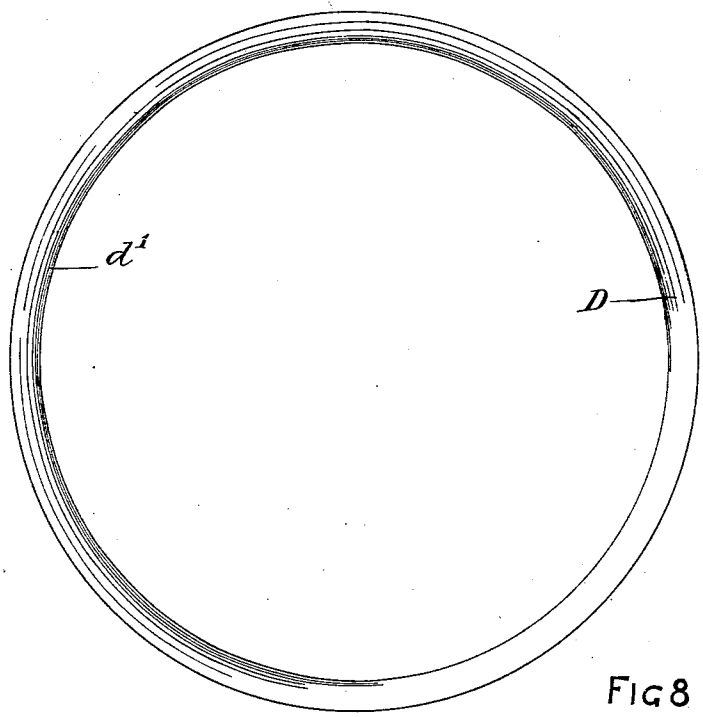


FIG 6

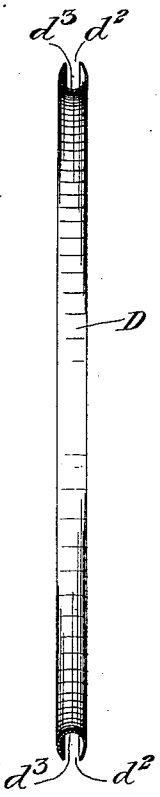


FIG 7

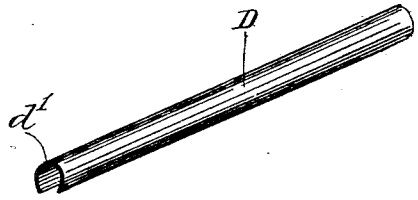
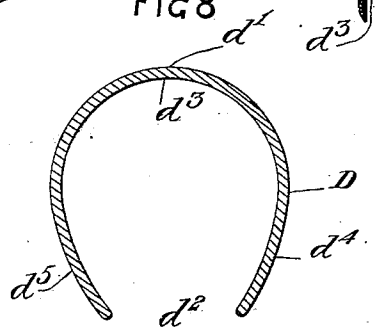


FIG 8



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UNITED STATES PATENT OFFICE.

SAM THOMAS RICHARDSON AND RICHARD PRICE, OF BIRMINGHAM, ENGLAND.

APPARATUS FOR BENDING INTO CIRCULAR FORM METALLIC WHEEL-RIMS.

SPECIFICATION forming part of Letters Patent No. 677,142, dated June 25, 1901.

Application filed May 3, 1898. Serial No. 679,637. (No model.)

To all whom it may concern:

Be it known that we, SAM THOMAS RICHARDSON and RICHARD PRICE, subjects of the Queen of Great Britain, and residents of Birmingham, county of Warwick, England, have invented certain new and useful Improvements in Machinery for Bending Metallic Wheel-Rims, of which the following is a specification.

This invention consists of the herein-described improvements in machinery or apparatus for bending into a circular form metallic wheel-rims which have in cross-section somewhat the shape of a horseshoe—that is to say, the cross-section of the wheel-rims with which our invention is used is of a very deep trough-section, the bottom of the trough being somewhat of a semicircular form, with the sides continued up to the periphery of the rim and gradually nearing each other, forming an opening all around the periphery, which is considerably narrower than the widest part of the rim. After a trough-section strip for forming a wheel-rim of this section has been drawn upon a draw-bench from a flat strip of metal it is found that the trough-section strip has twisted in drawing, and this twisting has to be got rid of during the process of bending the trough-section strip into the circular form of the wheel-rim ready for the ends of the strip to be brazed together. Moreover, it is most important that during the bending of the trough-section strip into the wheel-rim the sides of the trough be prevented from closing together and that they be kept open at the proper distance apart all around the wheel-rim, which is effected by this invention.

On the accompanying drawings, Figure 1 is a sectional front elevation of a trough-section wheel-rim-bending machine with the rolls constructed and arranged in accordance with this invention represented in the act of bending one of the wheel-rims. Fig. 2 is a plan of the said machine and part of the said wheel-rim. Fig. 3 is a sectional end elevation of the same. Fig. 4 shows separately the three rolls of the said machine. Fig. 5 is a front elevation of the complete wheel-rim. Fig. 6 is a cross-sectional elevation of the same. Fig. 7 shows part of the drawn metal strip from which the wheel is formed, and Fig. 8 is a full-sized cross-section of the same.

The same letters of reference indicate the same or corresponding parts in all the figures of the drawings.

In carrying out this invention we provide three rolls, (marked, respectively, A, B, and C,) of which the roll A is turned with a deep rounded groove a' and flanges a^2 a^3, so as to fit and act on the outside of the rounded part d' of the trough which forms the part of the wheel-rim D where the spokes are fixed. The other two rolls B and C are arranged at a short distance apart, with their axes b' c' parallel with each other and also parallel with the axis a^4 of the first roll A, so that the centers of the axles a^4 b' c' of the three rolls A, B, and C form the three points of a triangle. (See Fig. 1.) These two last-named rolls B and C are both of the same shape, and each is made with a central circular flange e of the proper width to enter the groove d^2 around the periphery of the rim D and to bear against the inside d^3 of the bottom of the trough. Turned in the rolls B and C at each side of the flanged part e there is a deep groove, (these grooves being marked, respectively, f' f^2,) shaped (see Figs. 2, 3, and 4) so as to match the outside of the sides d^4 d^5 of the rim D, (see Fig. 3,) and each of the rolls B C is made with two flanges g' g^2, which support the outside of the trough D. The flanges e of the rolls B C are by preference milled on their periphery, so as to make them grip against the inside of the bottom of the trough D and move same along between the rolls.

The machine-frame in which the rolls A, B, and C are mounted is that of an ordinary tire-bending machine, and in respect of this machine, apart from the rolls A B and C, we make no claim. The side frames H' H^2 of the machine-frame support the axles b' c' of the rolls B C in bearings h' h^2 h^3 h^4, and these axles have spur-wheels i' i^2, mounted, respectively, upon them, which gear with a spur-pinion i^3, mounted on the pin i^4 of the frame which receives rotary motion by the handle J or by other convenient means, so that the two rolls B C are turned in the same direction. The axle a^4 of the third roll A is, as is usual,

carried by the two vertical side bars k' k^2, which are formed with the cross-bar k^3, at the bottom, through which the usual adjusting-screw L passes for adjusting the position of the roll A nearer to or farther from a line joining the axles of the two rolls B C, according to the diameter of the wheel-rim into which the trough-section strip is required to be bent.

In using our invention the said metal trough-section strip D is passed between the rolls A, B, and C, as in an ordinary tire-bending machine, as shown in Figs. 1, 2, and 3, and by forming the rolls A, B, and C of the shapes above described and shown they effectually support the outside of the trough D, and at the same time by the flanges e e of the said two rolls B C entering the trough the sides d^4 d^5 of the trough are prevented from collapsing. The ring-like or circular form of the rim is obtained by the roll A being pressed by the screw L toward a line joining the centers of the other two rolls B C, as in an ordinary tire-bending machine.

The important feature of our invention is the construction of the two rolls B and C, which prevent the sides of the trough D from closing and also insure the openings d^3 of the trough being true and of the proper width all around the periphery of the wheel-rim.

What we claim as our invention, and desire to secure by Letters Patent, is—

In a machine for bending a trough-section strip of the kind herein referred to into a trough-section wheel-rim, the combination of the three rolls A B and C of which the roll A is made with a groove a' to fit against the rounded outside of the trough and the two rolls B and C which are each made with a flange e to take inside the trough and against the bottom of the same and keep the trough open and with the two grooves f' f^2 and flanges g' g^2 to support the sides of the trough, said rolls being arranged and operating in the manner substantially as hereinbefore described.

In witness whereof we have hereunto set our hands in presence of two witnesses.

SAM THOMAS RICHARDSON.
RICHARD PRICE.

Witnesses:
CHARLES BOSWORTH KELLEY,
HERBERT WHITEHOUSE.