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PATENTED NOV. 26, 1907.

J. M. HANSEN.

APPARATUS FOR TEMPERING AND ANNEALING CAR WHEELS.

APPLICATION FILED NOV. 15, 1906.

FIG. 1

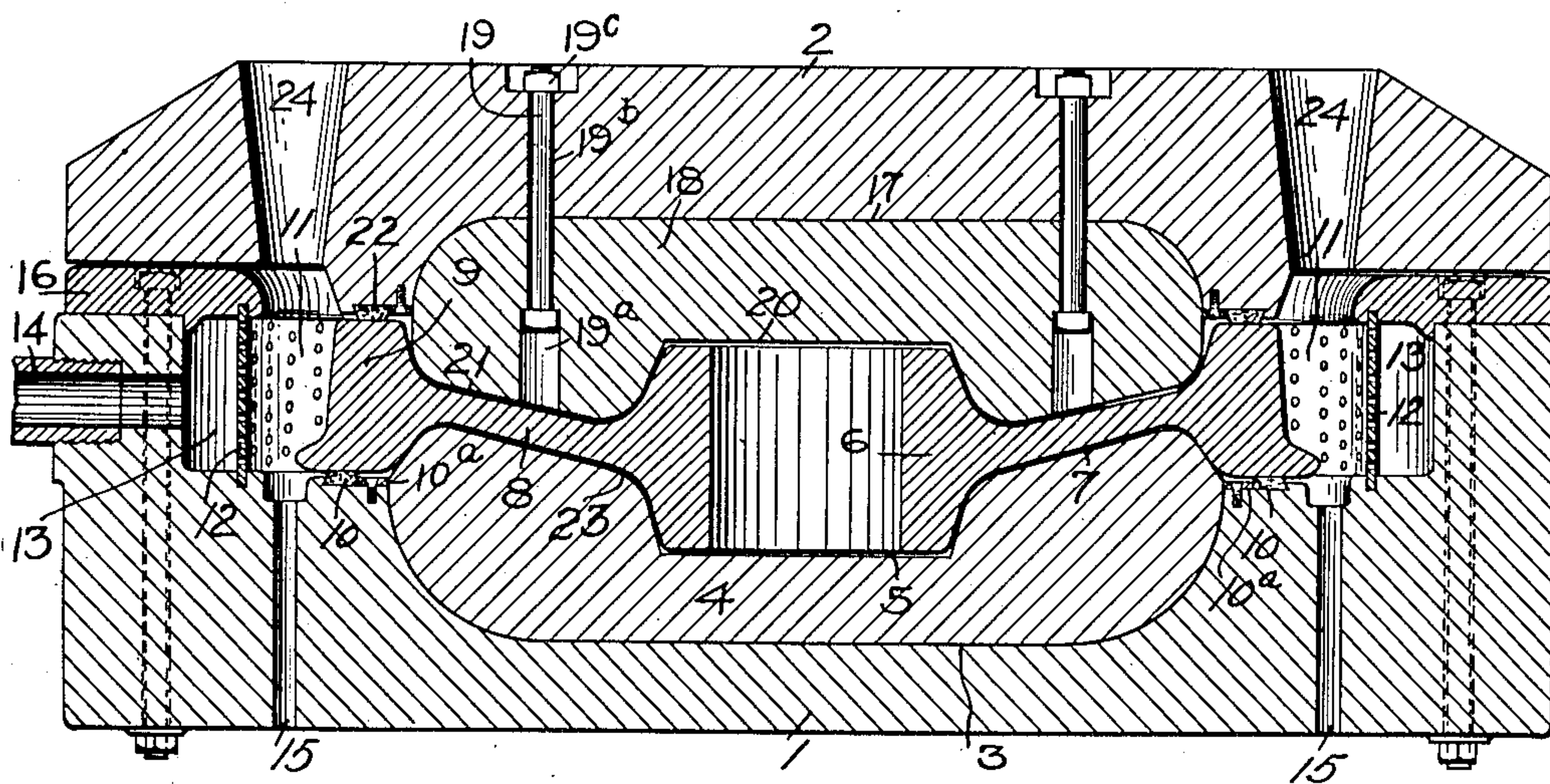


FIG. 2

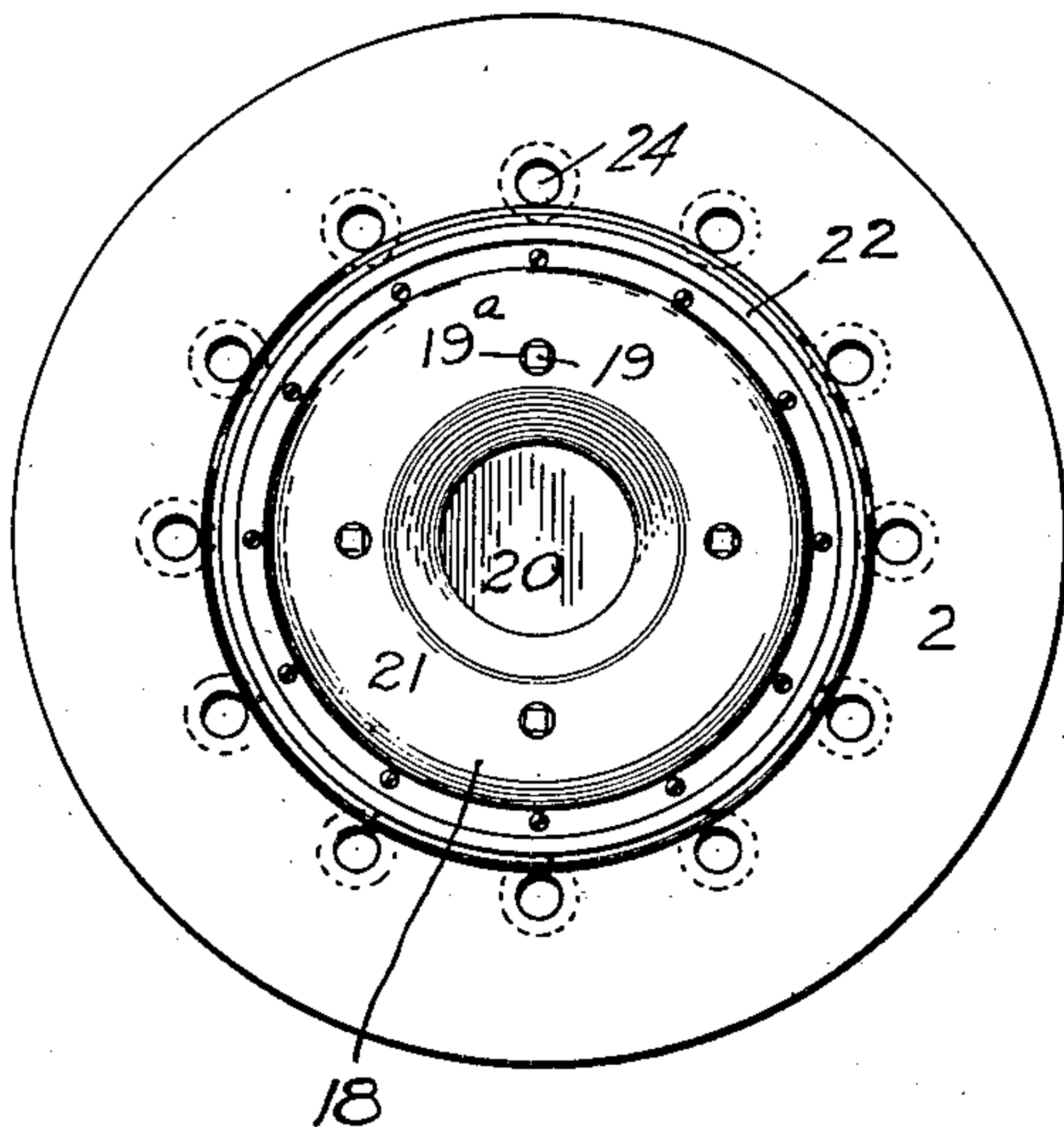
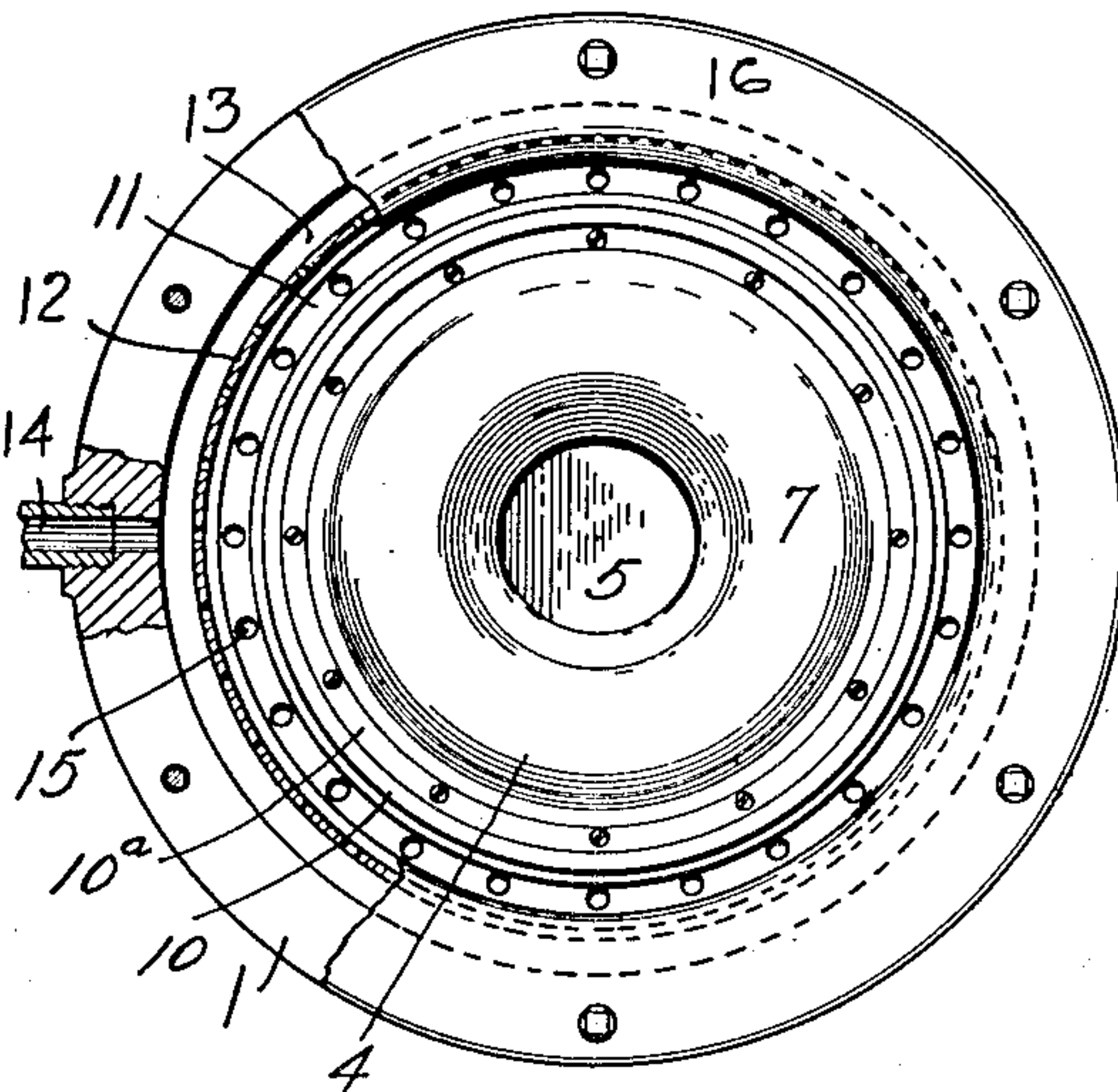


FIG. 3



WITNESSES.

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# UNITED STATES PATENT OFFICE.

JOHN M. HANSEN, OF PITTSBURG, PENNSYLVANIA.

## APPARATUS FOR TEMPERING AND ANNEALING CAR-WHEELS.

No. 871,931.

Specification of Letters Patent.

Patented Nov. 26, 1907.

Application filed November 15, 1906. Serial No. 343,572.

*To all whom it may concern:*

Be it known that I, JOHN M. HANSEN, a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Apparatus for Tempering and Annealing Car-Wheels; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to apparatus for the manufacture of car wheels, and especially to the tempering or hardening or retaining the hardness of the tread face thereof and the annealing of the body, including the web and hub. These car wheels are made from steel by forging operations or by combined forging and rolling operations, or are made of cast iron in suitable molds. It is desirable in such wheels that the body, including the hub and web portions as well as the inner portion of the tread shall be as soft and tough and free from strains as practicable, while the outer face of the wheel be as hard as possible so as to resist the wearing or abrading action of the wheel and so extend its life.

The present invention has for its object to provide apparatus to this end, and it is especially adapted for the treating of forged or forged and rolled steel car wheels, though applicable also to cast wheels.

The apparatus includes a case having a central heat retaining chamber inclosing the body of the wheel and a surrounding tread receiving or spraying chamber by which a suitable hardening medium can be projected against the tread face of the wheel, these two chambers being preferably sealed from each other by means of suitable packing engaging the upper and lower faces of the wheel, and the wheel body being preferably supported within the heat retaining chamber, such as by a refractory lining conforming in shape to the wheel body.

In the accompanying drawing Figure 1 is a vertical central section of the apparatus embodying the invention; Fig. 2 is a bottom view of the upper section thereof; and Fig. 3 is a top view partly broken away of the lower section thereof.

The cooling case embodying the invention is formed of two sections 1, 2, preferably made of cast metal. The lower section 1 has the cavity 3 to receive the lining 4 of suitable refractory or heat retaining material, such

as fire brick, this fire brick lining being preferably made to conform to the shape of the hub and web of the wheel, and as illustrated having the central depression 5 to receive the hub portion 6, and the inclined face 7 to fit to the web portion 8 and the inner face of the tread 9 of the wheel. Beyond the cavity 3 is secured a suitable packing 10, such as asbestos which contacts with the lower face of the tread 9, forming a watertight joint therewith to prevent the passage of the hardening or tempering fluid within the annealing or heat retaining chamber inclosing the hub and web. This packing 10 is shown as formed of a ring fitting within a dove-tailed seat formed in the lower case, the packing ring being held in place by the ring 10<sup>a</sup> secured to the case by suitable screws as shown. This lower case 1 has formed in it the tread receiving or spraying chamber 11, the outer wall of which is formed of the annular perforated plate 12 through which the water or other hardening or cooling medium is projected against the said face of the wheel. Back of this annular perforated plate is the annular water chamber 13 with which any suitable supply 14 communicates. Leading down from the spraying or tread receiving chamber 11 are a series of suitable discharge openings 15. As shown in the drawing the lower edge of the annular perforated plate 12 is seated in the body of the lower case 1, and its upper edge is set in an annular plate 16 bolted to and forming the top portion of the lower case.

The upper case or section 2 fits onto the lower case 1 as shown, and it has the central cavity 17 in which is seated the fire brick or like lining 18 shown as held within the cavity by suitable bolts 19 fitting within seats 19<sup>a</sup> in the fire brick lining and extending up through bolt holes 19<sup>b</sup> of the upper section 2 and held by suitable nuts 19<sup>c</sup>. This upper fire brick lining preferably conforms to the shape of the wheel, having the central cavity 20 to receive the upper portion of the hub 6 and the inclined face 21 fitting to the web portion 8 of the wheel and the back portion of the tread portion 9 thereof. This upper case 2 is also provided with a like asbestos or other heat retaining water proof packing 22, which contacts with the upper face of the wheel tread and with the packing 10 prevents passage of water into any portion of the heat retaining chamber 23, formed as



shown by the fire brick or like linings 4 and 18 above described. The upper case 2 is preferably carried out over the lower case 1, as shown, and is provided with a series of steam outlets 24 communicating with the upper portion of the spraying chamber 11 above referred to.

In the use of the above apparatus the car wheel, after the completion of the forging, or forging and rolling operation, while still at a suitable heat, is placed within the case formed of the two sections 1 and 2, as above described. The body including the web, and the inner portion of the tread, are thus inclosed within the heat retaining chamber 23 while the outer portion of the tread extends within the spraying chamber 11 and the passage of water into the heat retaining chamber 23 is prevented by the packings 10 and 22. The weight of the upper case 2 holds it in place. Water, oil or other suitable tempering or hardening medium is then forced through the pipe 14, travels around through the annular chamber 13 and is sprayed or projected against the outer face of the tread, acting to chill and temper or harden the same. The spraying is continued as long as desired, either during all or only a portion of the time of the cooling of the wheel body, the water draining through the outlets 15 and any steam formed in cooling and hardening the wheel escaping through the ports 24. The heat retaining chamber formed by the case is practically air tight and while so inclosing the wheel it prevents the rapid escape of the heat from the same. Meanwhile, the heat is retained within the body of the wheel, including the hub and web and the inner portion of the tread, by its inclosure within the heat retaining chamber 23, so causing the gradual annealing of the same, and while exposing the outer face of the tread to the cooling or hardening action, it is prevented from entering to too great depth into the wheel tread. It is preferred that the faces of the heat retaining linings in the chamber 23 fit closely to the wheel body so as to support and prevent the warping and distortion of the wheel body during cooling, the fire-proof lining of the lower case giving such support to the hub and preferably to the web of the wheel body. The wheel can be held within the case until it is entirely cool, the water spray being continued during all this time or a portion thereof as found best. By this apparatus I am enabled to properly anneal or cool the wheel body and remove any strain therefrom and also to increase the hardness of the wearing surface and so to largely increase the wearing qualities of the wheel. The apparatus may also be used to advantage with cast iron wheels to harden, or retain the hardness of the chill or other surface of the wheel during annealing. It may also be employed in connection with

wheels which have been worn, such as by re-dressing the face of the worn wheel and then heating the same and placing it within the case and subjecting it to the same slow cooling action as the body and tempering or hardening the face, and the life of the wheel is thus largely extended.

What I claim is:

1. An apparatus for treating car wheels having a central practically air tight heat retaining chamber adapted to envelop the body of the wheel when exposing the tread face thereof, and means for introducing a hardening medium against the tread face.
2. An apparatus for treating wheels having a central practically air tight annealing or heat retaining chamber and an annular tread receiving chamber around the same and means for introducing a hardening medium therein.
3. An apparatus for treating car wheels having a central practically air tight heat retaining chamber, an annular tread receiving chamber around the same and sealing means between said chambers.
4. An apparatus for treating car wheels having a central heat retaining chamber provided with a hub rest, and adapted to support the wheel at hub and rim, and means for introducing a hardening medium against the tread face.
5. An apparatus for treating car wheels having a central heat retaining chamber provided with a refractory lining, a tread receiving chamber around the same and means for introducing a hardening medium therein.
6. An apparatus for treating car wheels having a central heat retaining chamber provided with a refractory lining conforming in shape to and supporting the body of the wheel, an annular tread receiving chamber around the same and means for introducing a hardening medium therein.
7. An apparatus for treating car wheels having a central heat retaining chamber, an annular tread receiving chamber around the same, means for introducing a hardening medium therein and drain openings extending downwardly from the base of said tread receiving chamber.
8. An apparatus for treating car wheels having a central heat retaining chamber, an annular tread receiving chamber around the same, means for introducing a hardening medium therein, drain openings extending downwardly from the base of said tread receiving chamber, and steam outlets extending upwardly from said chamber.
9. In apparatus for treating car wheels, the combination of the sectional case having a tread receiving chamber 11, the perforated outer wall 12, the annular water chamber 13 around said perforated wall, the upper section having steam outlets extending upwardly through the same.



10. In apparatus for treating car wheels, the combination with a sectional case having the lower section provided with a central cavity, a fire brick lining fitting therein, the  
5 upper section having a central cavity and a fire brick lining fitting therein, means for suspending the upper lining in the upper section, and means for introducing a hardening medium against the tread face exposed between the two sections. 10

In testimony whereof, I the said JOHN M. HANSEN have hereunto set my hand.

JOHN M. HANSEN.

Witnesses:

ROBERT C. TOTTEN,  
J. R. KELLER.