C. G. ROBINSON & J. E. SCHLIEPER.

METHOD AND APPARATUS FOR PRODUCING CAST STEEL CAR WHEELS.

APPLICATION FILED NOV. 9, 1911.

1,153,258. Patented Sept. 14, 1915.

Fig. 1

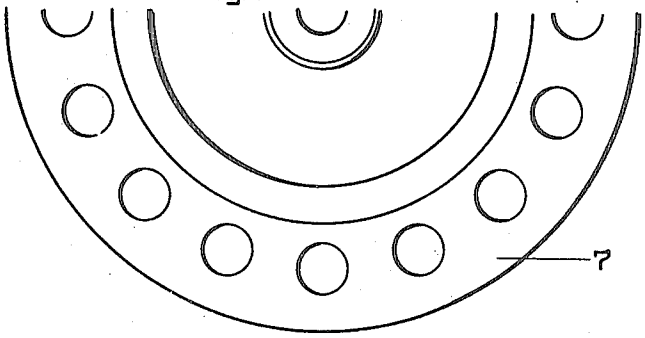


Fig. 2

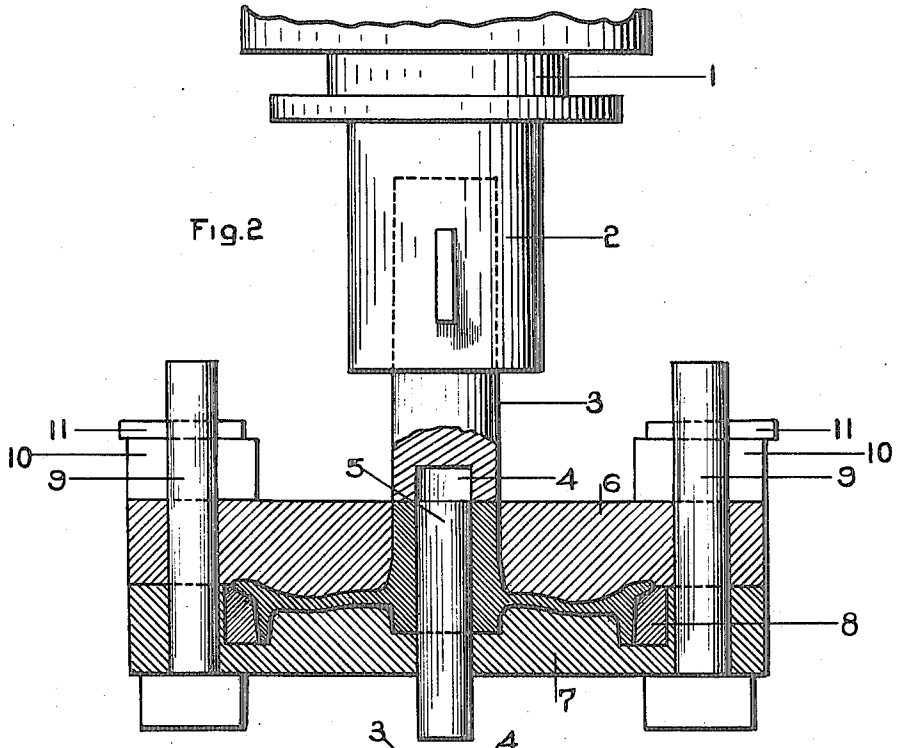
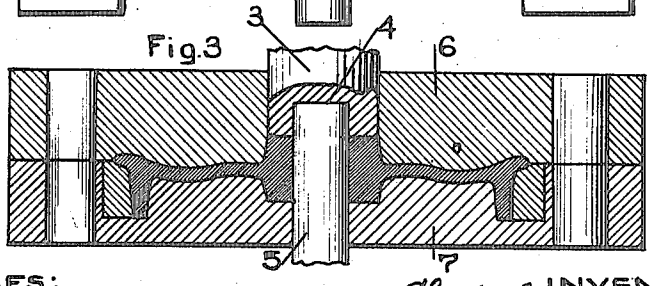


Fig. 3



WITNESSES:

E. J. Blakely

E. W. Williams

INVENTORS.

Charles G. Robinson and

John E. Schlieper by

Lowell Bros. ATTORNEY:

UNITED STATES PATENT OFFICE.

CHARLES GRIFFITH ROBINSON AND JOHN E. SCHLIEPER, OF PITTSBURGH, PENNSYLVANIA.

METHOD AND APPARATUS FOR PRODUCING CAST-STEEL CAR-WHEELS.

1,153,258. Specification of Letters Patent. Patented Sept. 14, 1915.

Application filed November 9, 1911. Serial No. 659,362.

To all whom it may concern:

Be it known that we, CHARLES GRIFFITH ROBINSON and JOHN E. SCHLIEPER, citizens of the United States, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, have jointly invented a new and useful Improvement in Method and Apparatus for Producing Cast-Steel Car-Wheels, of which improvement the following is a specification.

Our invention relates to improvements in processes and apparatus for making cast steel car wheels.

The object of our invention is to produce a method for making cast steel car wheels free from blow holes and imperfections; and also the production of an apparatus adapted to carry out the said method.

The herein described method of producing cast steel car wheels consists in pouring the metal into a suitable mold, the cope of which when superposed upon the drag furnishes a deeper recess for the hub than the drag in order to permit the pouring of a quantity of metal more than sufficient to form the wheel, so that the wheel when poured has a hub portion of molten metal of greater length on the cope side of the mold, than on the drag side. The mold is immediately after the pouring, placed beneath a pressure cylinder in which a hollow ram is operable. The hollow ram acting upon the excess metal in the cope and upon the movable metal core piece which forms the axle opening in the wheel, compresses the excess metal and forces the same throughout the entire wheel greatly solidifying and compressing the same, and at the same time expresses or excludes by back pressure whatever gases that may be entrapped in the molten metal, the pressure of the ram, and the escape of the gas due to said pressure producing an extremely solid casting free from blow holes and other imperfections.

We show an apparatus capable of practising the above described method in the accompanying drawings in which—

Figure 1 is a fragmentary plan view of the mold with the cope removed, the wheel in the drag being also shown. Fig. 2 is a vertical sectional view through the mold and a side elevation of the lower portion of the press, the lower end of the ram of the press being broken away and the ram appearing in its elevated position before being forced downwardly to compress the molten metal. Fig. 3 shows a section of the mold after the excess metal has been compressed.

Referring to the drawings, 1 is a pressure cylinder which is preferably operated by hydraulic means and is provided with a hollow ram 2, a supplemental ram 3 being operably mounted upon the said hollow ram 2. The said supplemental ram 3 has at its lower end a socket 4 adapted to engage over the upper end of the solid metal core piece 5 which is centrally disposed in the mold to form the axle opening in the wheel when produced. The cope 6 of the mold is formed of one solid casting having a central opening coinciding in diameter with the diameter of the hub of the wheel. The drag 7 is also formed of a solid metal casting and like the cope conforms in configuration or shape to the finished wheel. An annulus or ring 8 the inner face of which is shaped like the tread of the wheel is seated in the drag, and the drag and the cope are secured together in any suitable manner. In the drawings they are shown as being bolted together by means of numerous bolts 9, which pass through openings in the outer edge of the cope and drag. The bolts are provided with transverse holes through which splines or keys 10 are inserted, taper keys 11 being also inserted for the purpose of tightening the two portions of the mold *i. e.*, the cope and the drag. The metal is poured around the centrally disposed core, flows between the adjacent face of the cope and drag and against the inner surface of the ring, and as heretofore specified enough metal is poured into the mold to produce a lengthened side to the hub on the cope side of the mold which when compressed as heretofore stated is solidified and compressed as shown in Fig. 3 to about the proper thickness of the hub. This compression produces as heretofore specified wheels free from blow holes and other imperfections.

Having described our invention, what we claim and desire to secure by Letters Patent is:—

1. The herein described method of making cast steel car wheels, which consists in casting a wheel having an excess amount of metal at the hub on one side thereof, then applying local pressure to the hub portion of the wheel having the excess metal therein while the wheel is still within the mold so as

to force the said excess metal into the mold and cause the same to be distributed radially throughout the wheel, thereby solidifying the metal and preventing the formation of blow holes therein.

2. An apparatus for making cast steel car wheels, including a mold having a hub recess on one side thereof which is adapted to receive an excess amount of metal, and a pressure cylinder having a piston operating through the side of the mold and adapted to engage the hub portion of the wheel so as to force the excess amount of metal into the mold and distribute the same radially throughout the wheel, thereby solidifying the metal and preventing the formation of blow holes therein.

3. An apparatus for making cast steel car wheels including a mold having a hub recess on one side thereof adapted to receive an excess amount of metal, a centrally disposed core piece arranged at the hub of the wheel and projecting through the same, and a pressure cylinder having a piston operable through the side of the mold, said piston being formed with a positioning recess adapted to engage the core piece and being adapted to act upon the hub portion of the wheel to force the excessive amount of metal into the mold and distribute the same radially throughout the wheel so as to solidify the metal and prevent the formation of blow holes therein.

In testimony whereof, we have hereunto signed our names in the presence of two subscribing witnesses.

CHARLES GRIFFITH ROBINSON.
JOHN E. SCHLIEPER.

In the presence of—
JOHN H. RONEY,
CLARENCE A. WILLIAMS.