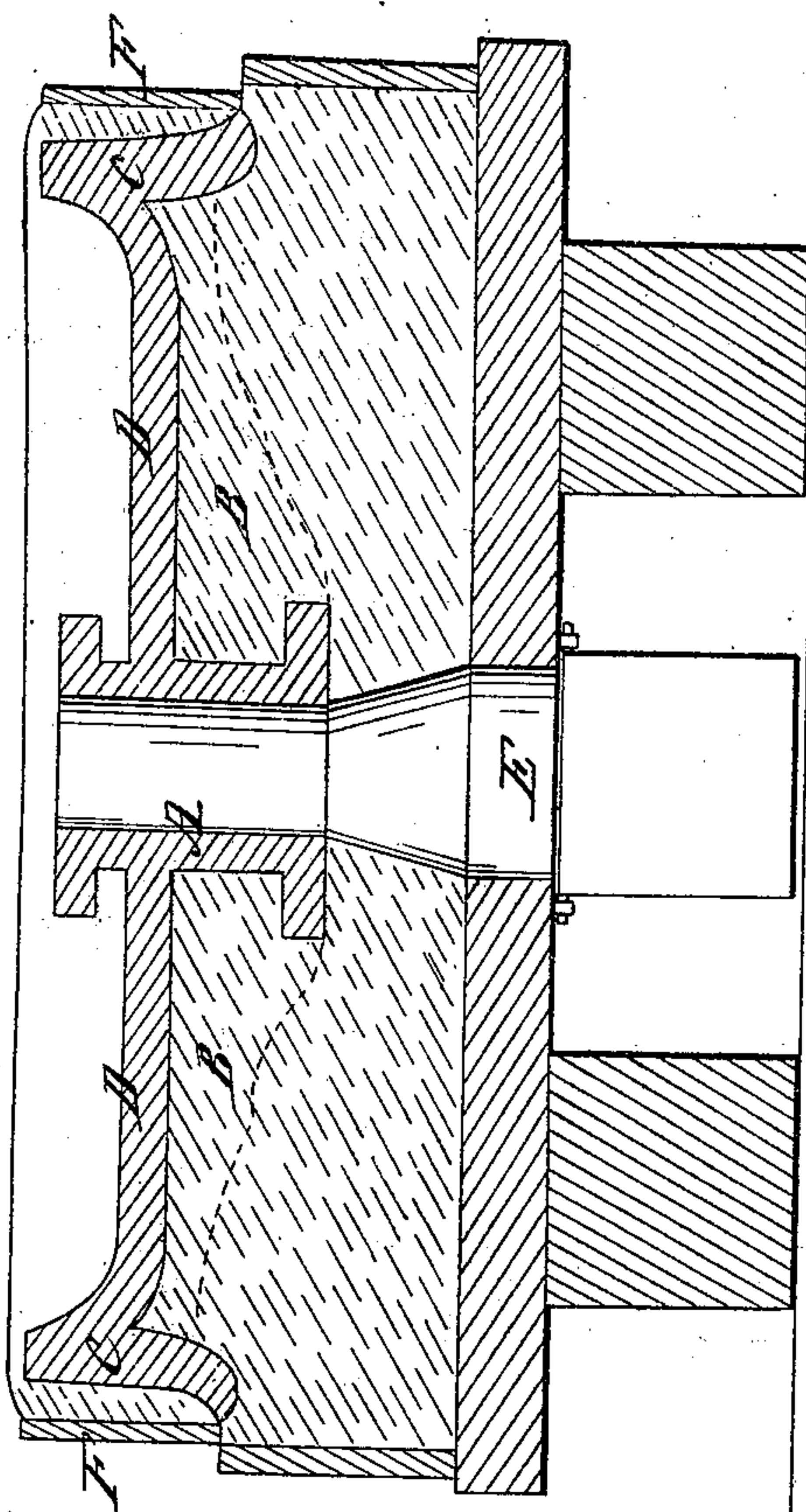


J. M. Sigourney,
Tempering Car Wheels,
No 13,585, Patented Sept. 18, 1855.



UNITED STATES-PATENT OFFICE.

JNO. M. SIGOURNEY, OF WATERTOWN, NEW YORK.

COOLING CAST-IRON CAR-WHEELS.

Specification of Letters Patent No. 13,585, dated September 18, 1855.

To all whom it may concern:

Be it known that I, JOHN M. SIGOURNEY, of Watertown, in the county of Jefferson and State of New York, have invented certain new and useful Improvements in Cooling Cast-Iron Car-Wheels and in the Apparatus Connected Therewith; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which is represented a transverse section of the lower portion of a flask with a wheel therein in the process of cooling.

I construct a car wheel in one piece by casting the hub A, with a disk or plate D, placed at right angles therewith, and supported on one side by braces B, proceeding from the hub to the tread C, on the inner side of the wheel, the braces extending from the disk to the inner extremity of the hub. Smaller braces are placed on the outer side of the wheel, between the outer extremity of the hub and the disk.

I make all the parts excepting the tread and flange of one uniform thickness, and in order to accomplish this object without impairing the strength of the hub at its extremities (where the greatest strength is required) I form recesses in the hub bounded by the plate, braces, and metal left at both ends of the hub. The tread and flanges are made thicker than the other parts and are cast against an iron chill that they may be hardened. As soon as the casting is sufficiently solidified, which will be in about six minutes, the chill is removed with the upper portion of the flask to which it is attached, and the center core is knocked out through a trap E, left in the bottom of the flask for that purpose, so that the air may have free access to the interior of the hub. The usual mode of forming the hub of great thickness presents difficulties which are obviated in the form I use. The latter does not remain in the molten form so long, and can be sooner prepared for cooling, and the rapid abstraction of heat from the tread and flange be stopped in a shorter time.

After the wheel is poured, (the chilling being done in the instant of contact of the melted metal with the chill), the different parts have different degrees of heat, and it is of the first importance that an equilibrium should be made as soon as possible in

order to insure equality in cooling, and that the casting be cooled as soon as practicable, that the chilled parts be not annealed by long heating. The center being the hottest, the temperature of that part is reduced by allowing the air to have free access to the interior of the hub by the removal of the core.

A sheet iron ring or casing F of a diameter about two inches greater than that of the wheel, and of the same width as the chilled portion thereof, is placed concentrically around the wheel to retain in position the hot sand which is then drawn from the surface of the casting into the annular space between the casing F, and the tread of the wheel. In scraping the sand from the surface, a portion of the sand adheres to the heated metal, but that portion of the wheel which is cast against the chill is of course clear of sand, thence arises the necessity of compensating for these different conditions, and equalizing the radiation of heat by retaining the hot sand about the chilled portions by the means above described. This performs the same office in retarding the cooling as the incrustated coating of sand on the other portions of the wheel does.

Heated ovens and pits have been used, in which the wheels are placed, and gradually cooled, but these produce the effect of annealing the chilled parts, and weakening the others, from the length of time required in the process, and do not equalize the cooling, for the chilled parts being free from sand must as the ovens or pits become reduced in temperature, cool before the other parts, because of the different conditions in regard to the coating of sand before alluded to. Various other plans have been suggested, but they are either cumbersome, expensive, or complicated.

My invention presents the advantage of simplicity in its construction and manipulation. Each wheel is cooled by itself under the same circumstances, and when the process is performed according to the directions herein set forth, nothing is left to the judgment or skill of the workman. By cooling the wheel in the flask, the danger is avoided, of warping it, by handling before it is sufficiently solid; and this plan also has the advantage of cooling the casting in a few hours, or in about the time required to cool

ordinary castings of the same size, thus incurring the least possible risk of annealing and weakening the casting.

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

The arrangement of the mold, chill, and

ring F, operated in the manner set forth, for equalizing the cooling of the car wheel.

JNO. M. SIGOURNEY.

Witnesses:

CHAS. EVERETT,

JOHN S. HOLLINGSHEAD.