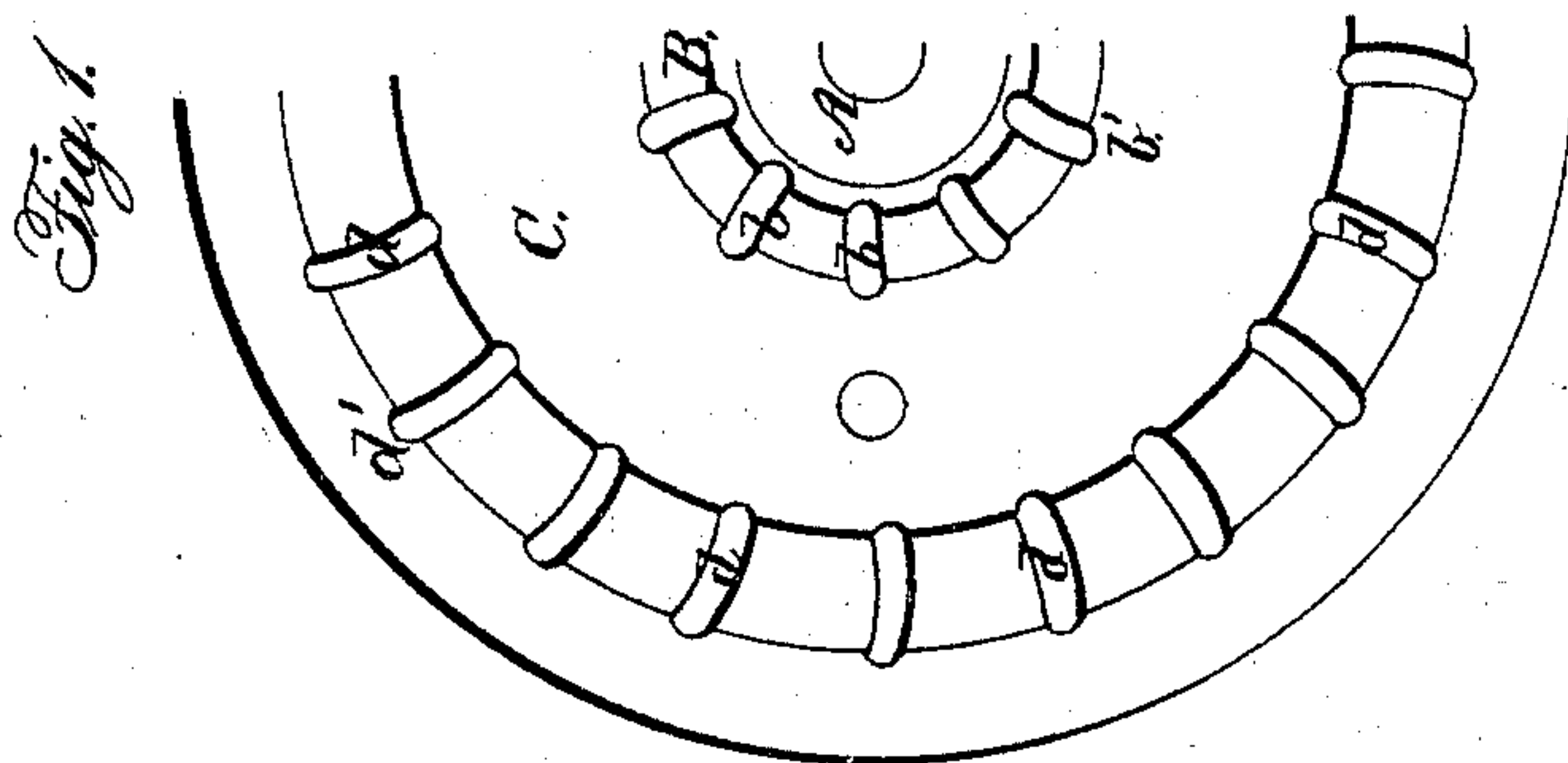
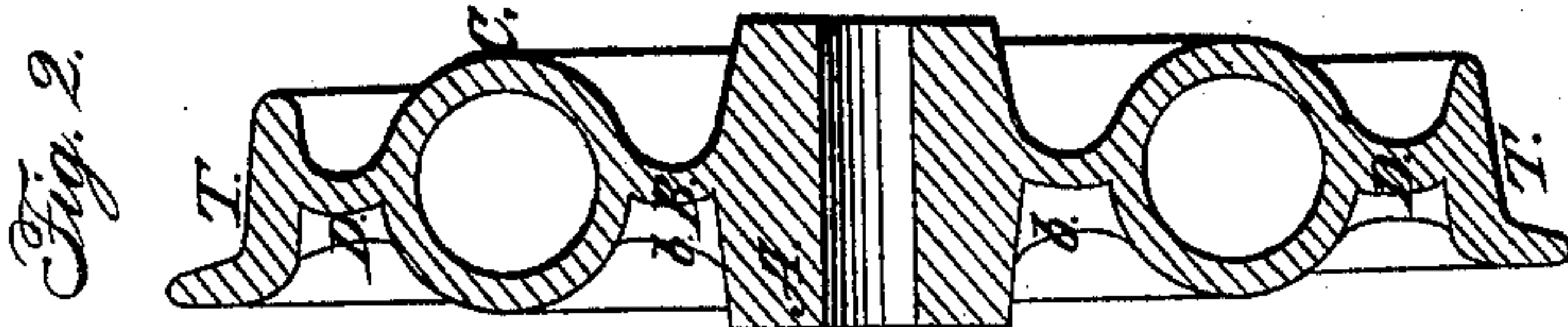


I. VAN KURAN.

Car Wheel.

No. 8,108.

Patented May 20, 1851.





# UNITED STATES PATENT OFFICE.

I. VAN KURAN, OF BOSTON, MASSACHUSETTS.

## CAST-IRON CAR-WHEEL.

Specification of Letters Patent No. 8,108, dated May 20, 1851.

*To all whom it may concern:*

Be it known that I, ISAAC VAN KURAN, of the city of Boston, in the county of Suffolk and State of Massachusetts, have  
5 invented a new and useful Improvement in Cast-Iron Wheels for Railroad-Cars; and I hereby do declare that the following is a full, clear, and exact description, reference being had to the annexed drawings,  
10 making a part of this specification, in which—

Figure 1, is a front view or elevation of the wheel. Fig. 2, is a vertical transverse section taken through the middle of the  
15 wheel.

The same letters refer to like parts on the said figures.

The nature and object of my invention, is the construction of a cast iron car wheel  
20 which will combine strength of form with great lightness of material, and for this purpose I cast the wheel with a solid hub and join the said hub to the tread by a curved plate next to the hub, which plate  
25 is strengthened by curved outside braces, then a circular tube running around the face of the wheel, and then a curved plate joined to the said tube and the tread of the wheel. The outside curved plate is also  
30 strengthened with outside braces, running in such a manner, that the curved braces on the inside curved plate next the hub, branch out so as to be opposite to the spaces between the outside braces.

35 To enable others skilled in the art to make and use my invention I will proceed to describe its construction.

A, is a solid hub.

40 B, is a curved solid iron plate, one side of which (the outside) is convex, and the other side concavo. Around this plate are cast curved braces *h, h*.

45 C, is a tube cast around the wheel and situated about midway between the solid hub A, and the tread of the wheel.

D, is another curved solid plate, formed exactly like the plate B. It also has curved metal braces *d, d*, cast on it. These curved braces are formed like the braces *b, b*, but  
50 their terminating sections outside at *d*<sup>1</sup> project in a different direction from that of the terminating section *b*<sup>1</sup>, of the inner braces *b*. If the inside curved braces branched out to the tread continuing their  
55 form as joined with the outside curved braces *d*, each whole brace would present a

form on the side of the wheel like an S brace, a most excellent form for strength. This however, could not be done without  
60 weakening the whole wheel, for the braces would then be very wide apart at the outside, just where the greatest strength is wanted. To retain the S form of the braces and compensate for the distance they would  
65 be apart at the outside, I place just double the number of braces *d*, on the wheel that there are of those marked *b*, so as to have the inside tier of braces (each brace) project outward toward the spaces between the  
70 outside braces.

There are two desirable objects to be obtained in the cast iron rail road car wheel: one is lightness of metal combining a good  
75 form for strength; and the other is a good form in every part for casting.

I do not say that the present form of wheel herein described, is of a better form for strength than the wheel patented by me  
80 May 1st 1849, nor do I think it is quite so good, but it combines rather a better form for casting and contains to the same diameter about thirteen pounds less of metal, which enables the wheel to be sold at a less  
85 cost, this being an advantage more in favor of the buyer than the seller; and a wheel certainly meets all that is demanded of it, when it has been tried and found to be perfectly adapted to its specific object. This  
90 wheel now described, I have faithfully tested, and some of the kind are now in actual use, and give every satisfaction both as it respects durability, strength and lightness.

In casting wheels, there is much difficulty experienced in the shrinkage of the metal  
95 when in the act of cooling; this is the fruitful cause of waste in castings by breakage. A bad form of wheel, for casting although it may be a strong form, is of doubtful utility, because there may be many unseen flaws  
100 which do not develop themselves until the wheel is on the car and running; when at once the centrifugal force separates the parts that have flaws in them from the sound parts, there is a break down, and perhaps a serious accident. This form of wheel  
105 is a very excellent one for casting so as to make all the parts shrink together in cooling in such a way that the thinner portions of the metal have some compensating qualities  
110 combined with them.

The hub being the thickest part of the



metal, it will not shrink altogether so fast, as the other parts, but then, by its core being taken out, the interior can be cooled in such a way, along with the outside as to make it shrink all together about the same time, that it requires the curved plates B, with their braces to shrink. The pipe or tube C, being thin it can be tempered in the cooling by keeping the core in until all is cool. The tread can be cooled as desired it being on the outside. I find however, that this form of wheel cools with greater uniformity, therefore the shrinkage is equalized and good castings are uniformly the result. Its qualities in the respects stated I believe, are superior to any other wheel in use.

Having thus explained my invention I claim—

A cast iron rail road wheel constructed with the solid hub A, and the tube C, the said tube being united to the hub by a curved plate B, with curved projecting braces *b, b*, on it and connected to the tread T, by a curved plate D, with the curved braces *d, d*, on it; the whole being constructed substantially as described for the purpose set forth.

ISAAC VAN KURAN.

Witnesses:

PATRICK SULLIVAN,  
JOHN A. LORING.