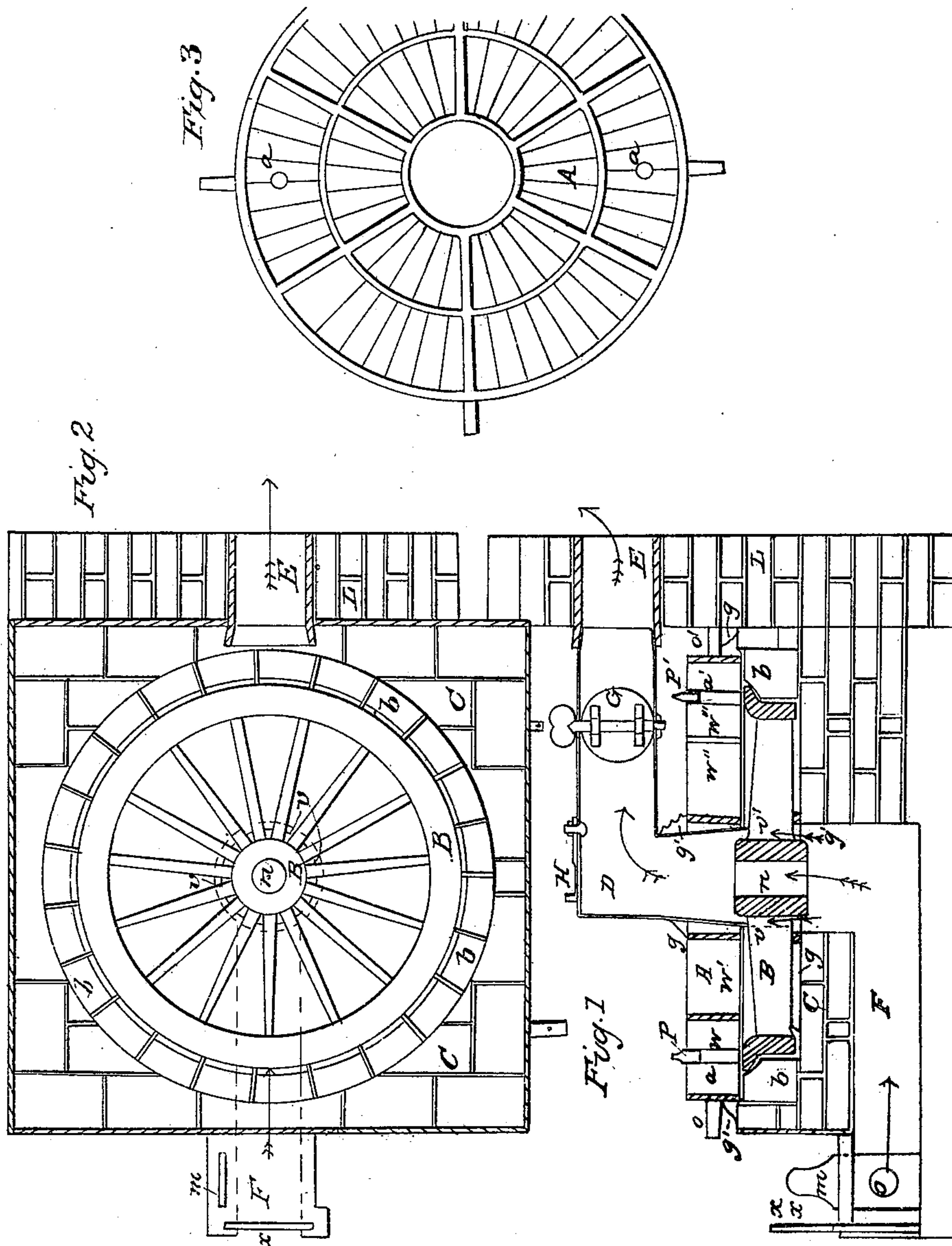


J. MURPHY.
Tempering Car Wheels.

No. 6,633.

Patented Aug. 7, 1849.



UNITED STATES PATENT OFFICE.

JNO. MURPHY, OF KENSINGTON, PENNSYLVANIA.

METHOD OF REGULATING THE CONTRACTION OF CAR-WHEELS.

Specification of Letters Patent No. 6,633, dated August 7, 1849.

To all whom it may concern:

Be it known that I, JOHN MURPHY, of the district of Kensington, in the county of Philadelphia and State of Pennsylvania, have discovered and invented a new and Improved Mode of Cooling and Thereby Regulating the Contraction of Chilled Railroad-car and other Wheels and Pulleys with Solid Hubs; and I do hereby declare that the following is a full, clear, and accurate description of the method adopted for effecting the cooling and contraction.

The many attempts that have been made to cast iron wheels in one piece with solid hubs have in most cases been unsuccessful, and in the few successful modes there is a degree of uncertainty and complication in the manipulation that renders the process expensive. The object to be effected is to cause all the parts of the wheel to cool and contract in due relative proportion in which there is found great practical difficulty, owing to the difference of the thickness of the parts, especially the hub as compared with the other parts. As the difficulty was well known, many modes were devised to remedy the defect—and plate wheels of a curved form have been resorted to which would yield to the strain inevitable on cooling the wheel in the usual way, but this only lessened the evil effects without removing the cause. A second mode was the attempt to chill all parts of the wheel in an iron chill, but I believe this to be wholly unsuccessful. A better mode has been patented in which the wheels are taken from the flask and chill and placed in an oven heated to a high degree by a fire made within it, and when a sufficient number of wheels were put in this oven it was sealed and allowed to cool gradually occupying two or three days' time to sufficiently reduce the temperature for removal, thus retarding the cooling of the thinner parts of the casting till the heavier parts are equally reduced in temperature. Before these specific modes above stated had been devised, it was a common thing to cool thick parts of castings by pouring water upon them, and in some instances the sand has been removed from them for that purpose, but it has always been found that it produced sudden and unequal contractions causing the parts to strain, and when used for cooling the hubs of wheels, leaving them as unsound or nearly so, as when left to cool in the natural way. It is in ordinary

practice impossible to regulate the cooling in this way with exactness as water cannot be kept in constant contact with the parts without reducing the temperature too much, and any mechanical device for supplying it must be attended with trouble and expense. It is obvious also when the sand has been removed from the hub as above stated that the air will have free access to the hub but without any means of regulating its action or producing a sufficient effect which requires a strong current. Hence it has been the universal custom, nearly to the present time to cast wheels with split hubs, a practice that is still followed by some of the best founders who have not the patented processes. My mode of handling wheels after they are cast is, to remove them from the flask and chill as soon as I can, and place them in a case of brickwork or other non-conductor or bad conductor of heat, which case is so formed as to inclose all the wheel except the hub, and is heated so as to be air tight, this retards the cooling of the rim and arms which is very important, while at the same time there is no chance of elevating their temperature above the point they are at when placed in the case so as to endanger the crystallization of the rim by the chill, and the equal cooling of these parts is insured without further attention.

To reduce the temperature of the hub from which the core has been removed an air pipe passes under the case to the hub at the center through which a rapid current of air is made to pass by fan-bellows or other mechanical device or by the strong draft of a chimney stack, being at the same time regulated by proper valves. When the latter plan is adopted as shown in the drawing, a pipe leads from the center of the case over the hub into a chimney (for this purpose I usual employ the stack of the cupola) in which a small charcoal fire may be made to assist the draft, by this apparatus I can quickly reduce the heat of the hub and cause an exact and equal contraction corresponding properly with that of the rim, and thus turn out a perfect wheel with comparative certainty in about twenty-four hours or less, free from strain in any part. The advantage of removing the wheel from the chill is, that the heat is not so rapidly abstracted from it in the case as the chill would do, and all the beneficial effect produced by the chill is attained when the

metal crystallizes; and the combined action of retarding the cooling of the rim and hastening that of the hub in the manner above set forth relieves the parts from all strain.

5 The mode of operation and construction is as follows.

The description of the parts of my apparatus may be simplified by reference to the annexed drawings, making a part of this
10 specification, in which—

Figure 1, is a side view of the case. Fig. 2, is a top view of the wheel when in the case and Fig. 3, is a top view of the cover of the case.

15 I will proceed to describe my invention by reference to the drawings.

A is the cover or top of the case made of brickwork or other non conductor of heat bound with iron rings on the outside
20 and in the center over the hub which is left exposed. (*o o'*) are handles to this top or cover by means of which its position may be changed. (*w' '' ''*) indicates the brick work of this top or cover. (*a a'*) are holes
25 in the top or cover through which the temperature of the rim of the wheel may be watched. (*p p'*) are plugs or stoppers made of clay or other non combustible materials with which to close the apertures (*a a'*).

30 B is the wheel in the case. (*n*) is the eye of the wheel. (*v'*) the holes on the outside of the hub which are made in the sand and through which the air passes.

35 C, is the brickwork of the case. *b*, indicates the bricks around the tread of the wheel.

D is the pipe or flue leading from the top of the hub into the stack or chimney (L) through the hole therein marked (E).

40 F indicates the inside of the trunk or pipe under or in the case through which

passes the stream of cold air to the hub of the wheel. *x*, is the door or gate at the mouth of this trunk or pipe through which the cold air enters by natural draft. *m*,
45 shows a smaller door at the aperture O in the side of the pipe or trunk through which the cold air enters by a bellows, fan &c.

G is a valve in the pipe or flue D which regulates the amount of air passing through
50 and around the hub.

H indicates a cover over an aperture in the top of the pipe or flue D, through which aperture a slight bar may be inserted with which to push out the core from the eye of
55 the wheel after it is placed in the case. In this cover is inserted a glass through which the temperature of the hub may be watched.

(*g*) shows the sand or clay filling up the
60 joint between the inner ring of the top or cover of the case and the outside of the flue or pipe D over the hub and (*g'*) the sand or clay in the joint below the handles between the case and its cover, thus making
65 these joints air tight.

What I claim as my invention and discovery and desire to secure by Letters Patent is—

The mode of cooling and thereby regulat-
70 ing the contraction of chilled railroad car and other wheels and pulleys with solid hubs by the application of a stream of cold air to the hub, in the manner above described, in combination with the non-con-
75 ducting case for retarding the cooling of the rim as herein set forth.

JOHN MURPHY.

Witnesses:

JNO. CLAYTON,
ARMON DAVIS.