

G. S. BOSWORTH.
CAR WHEEL.

No. 30,458.

Patented Oct. 23, 1860.

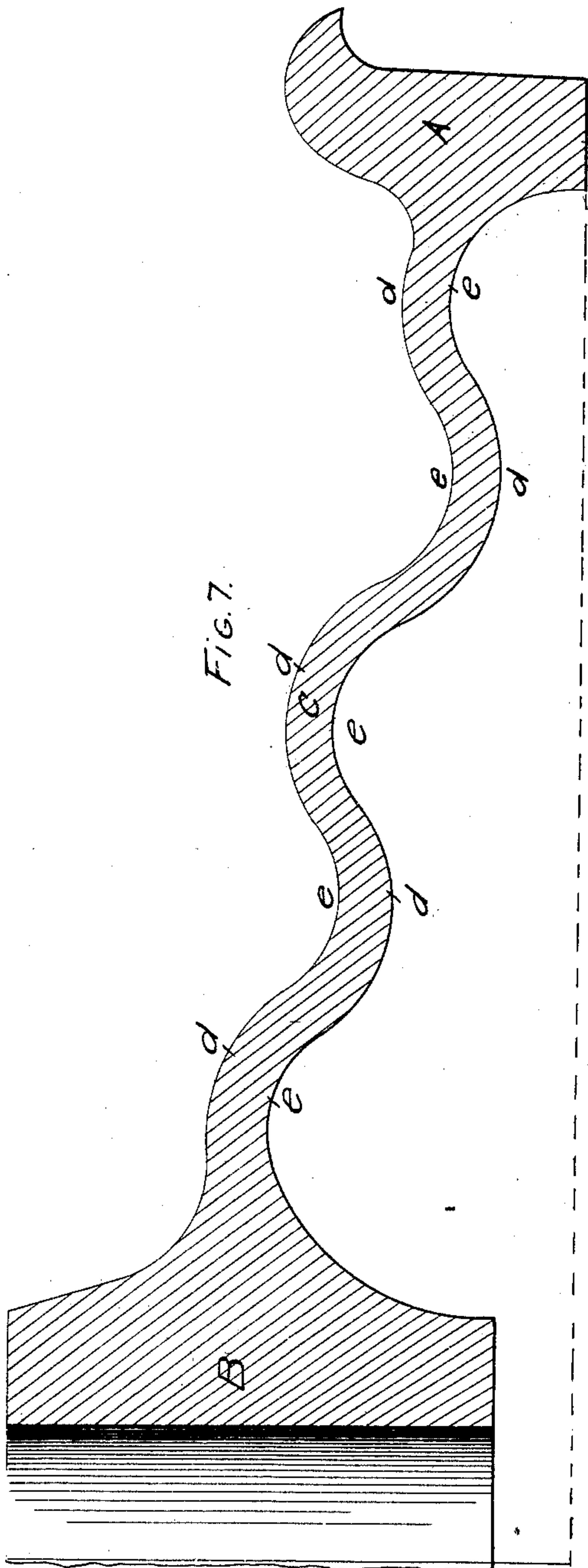


FIG. 7.

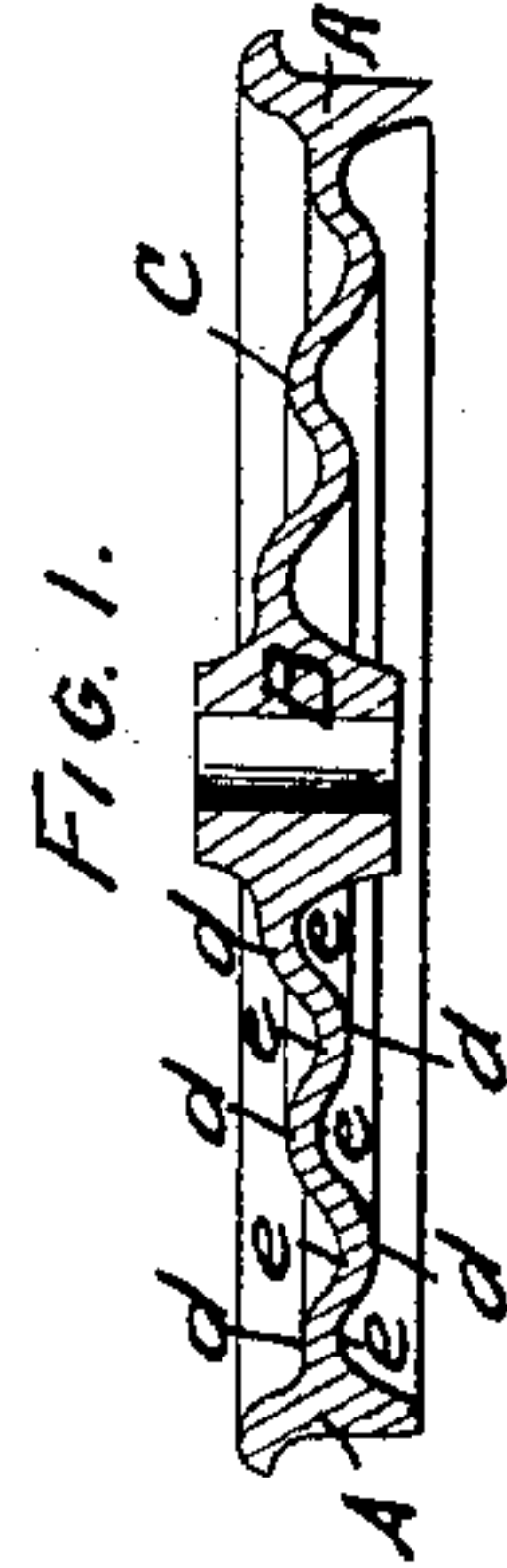


FIG. 1.

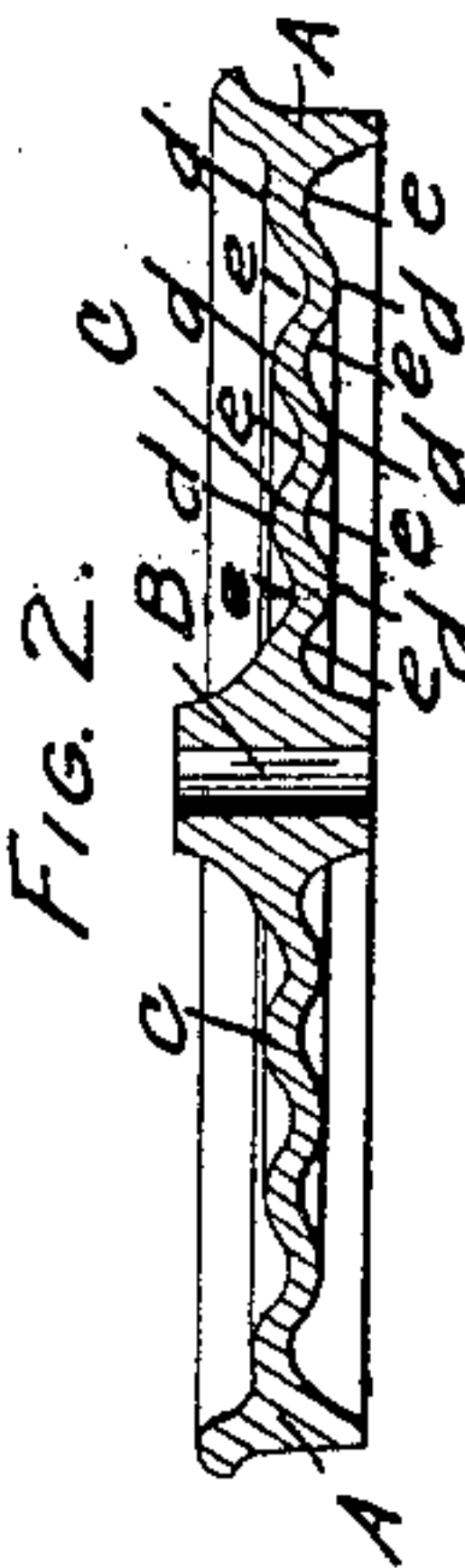


FIG. 2.

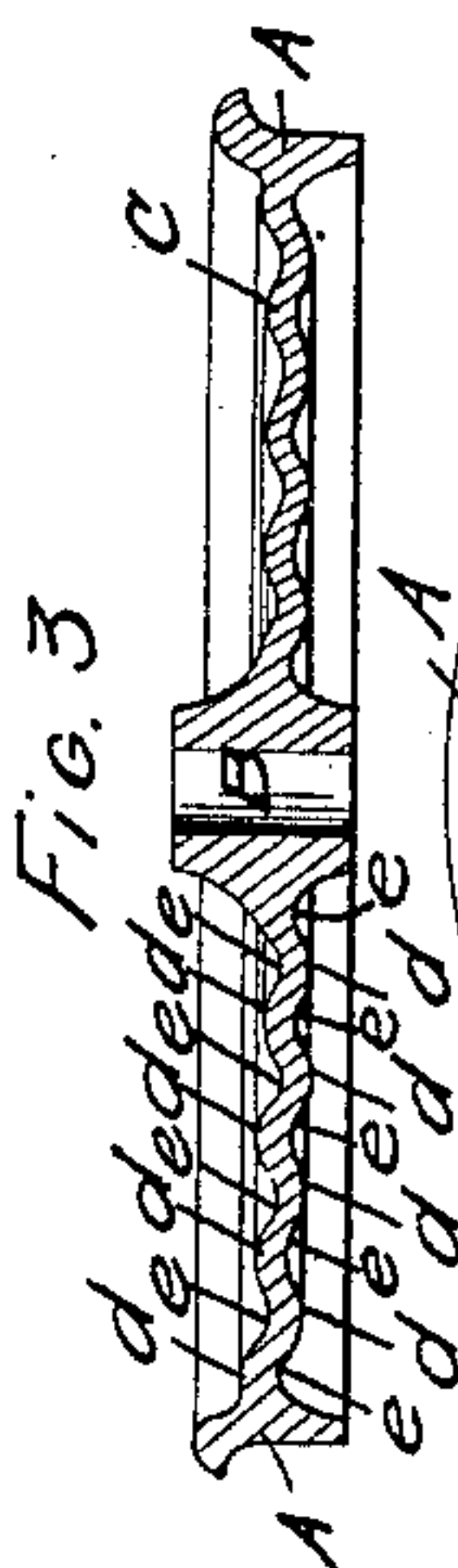


FIG. 3.

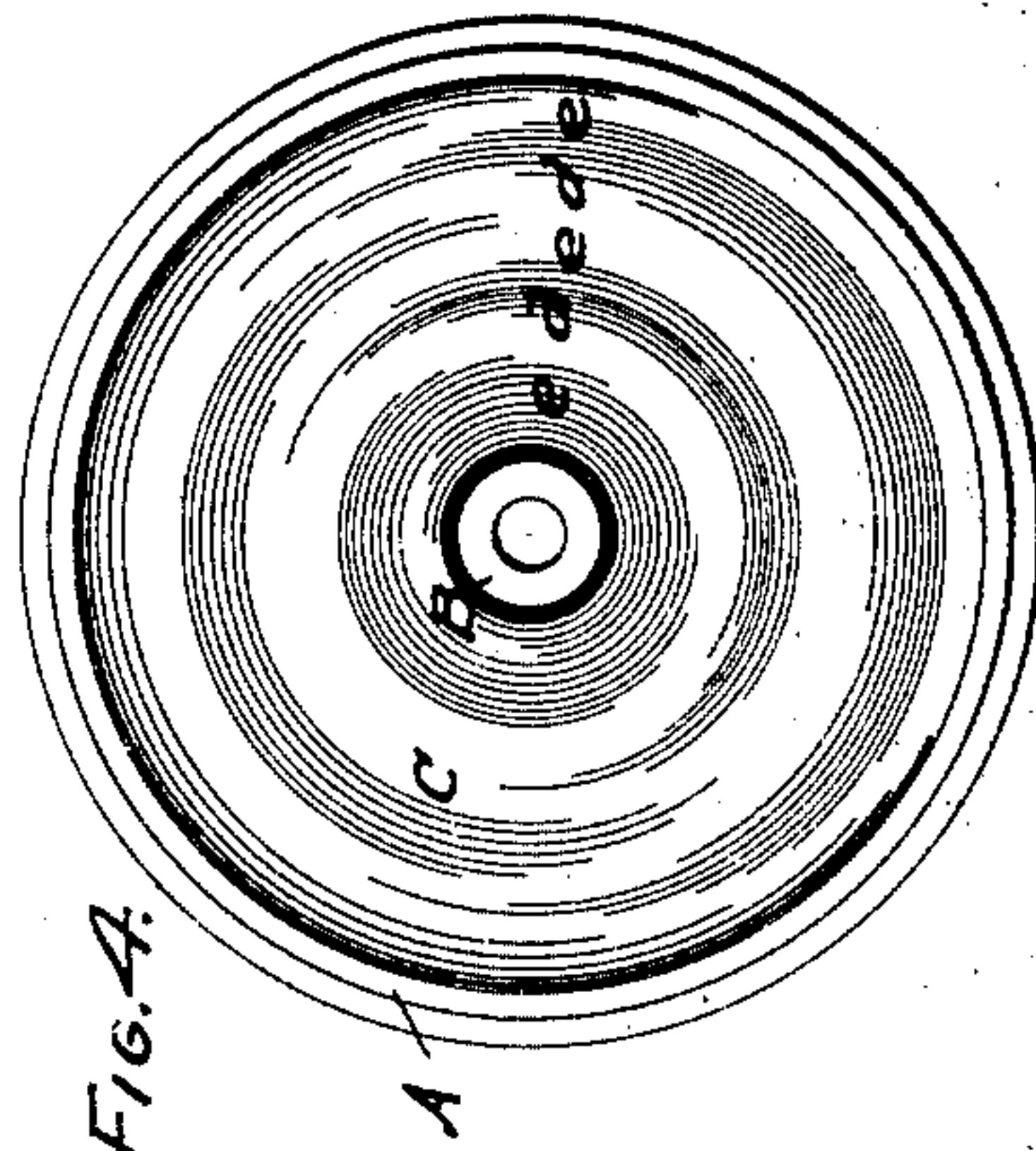


FIG. 4.

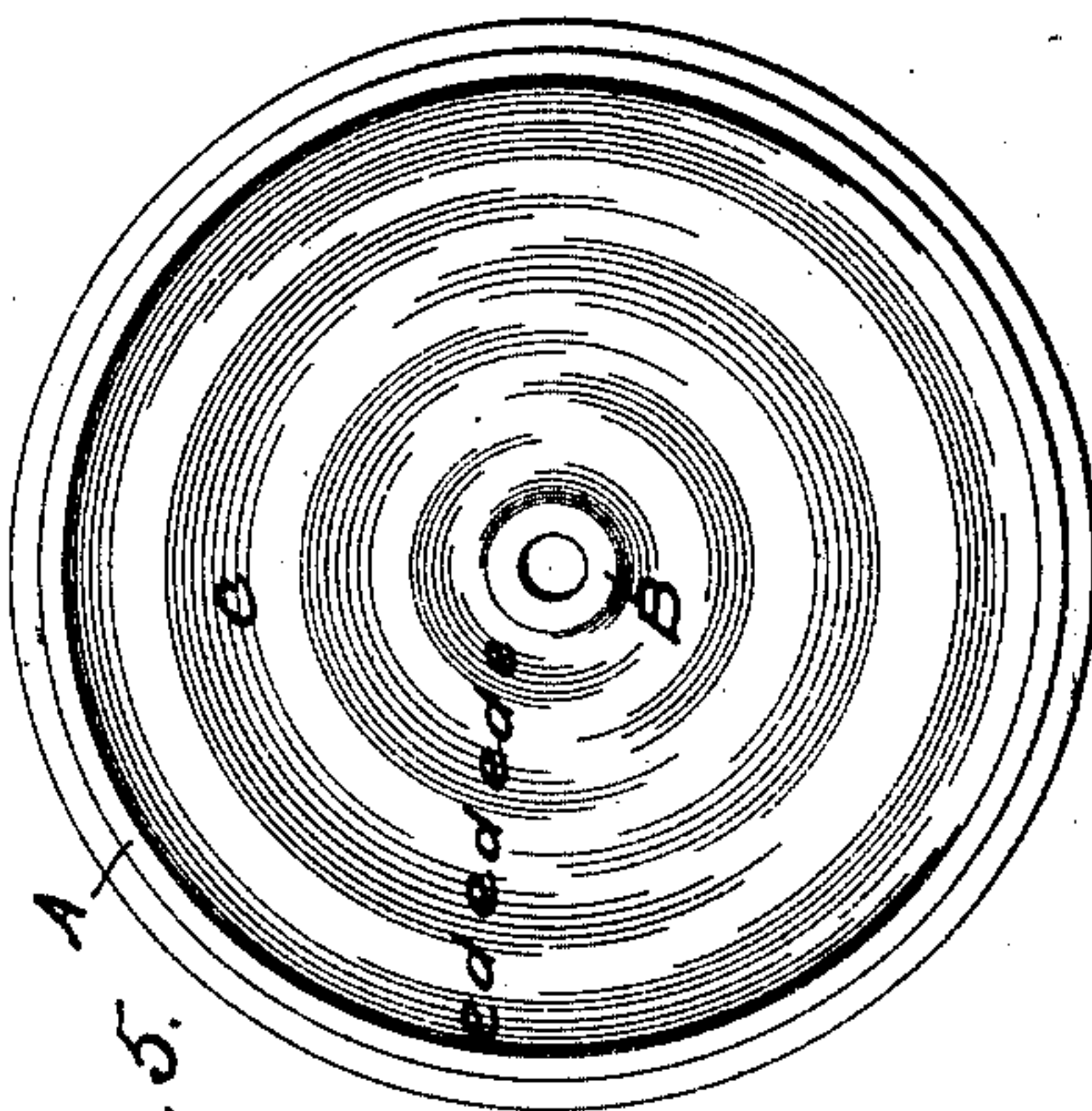


FIG. 5.

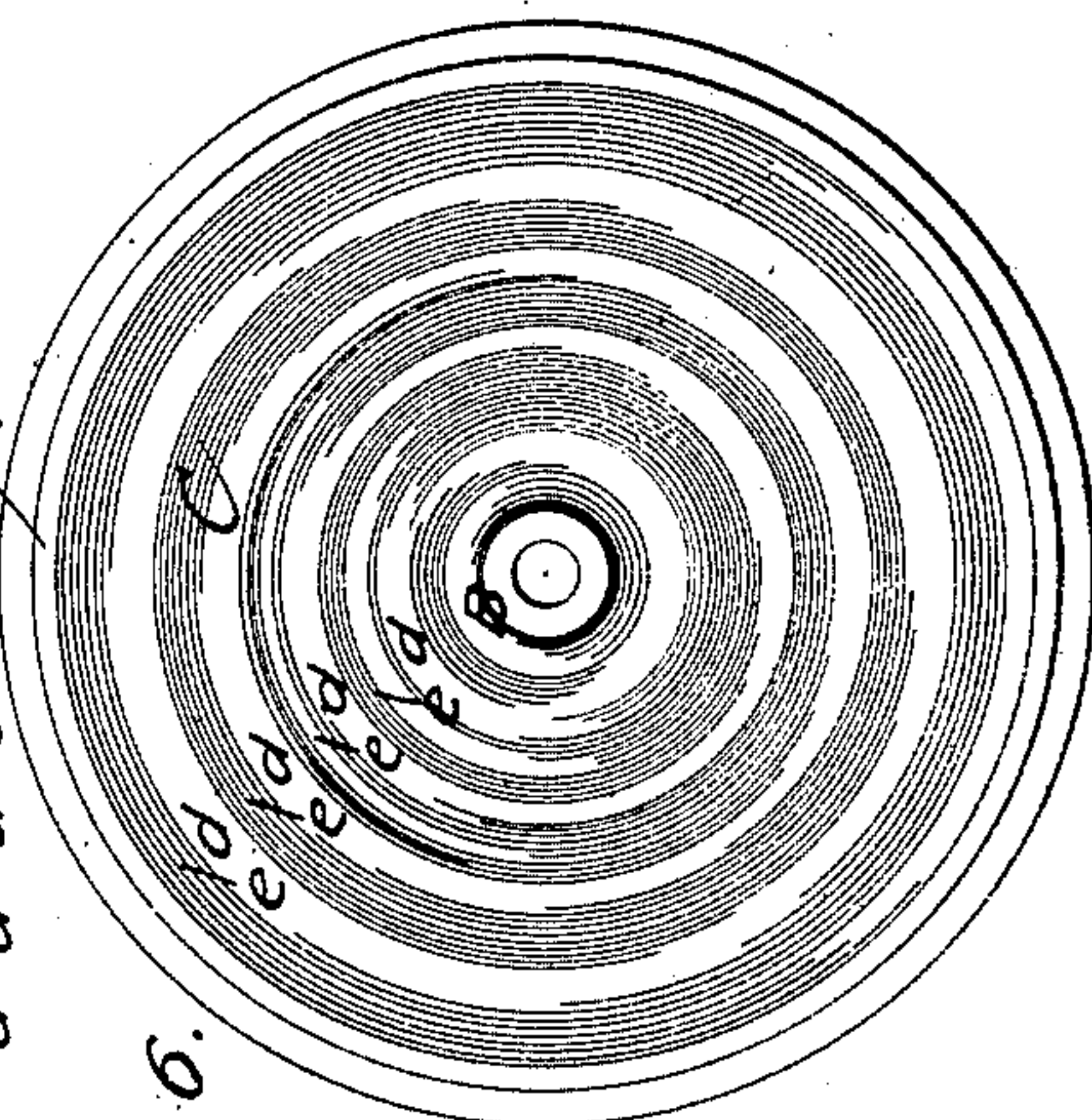


FIG. 6.

Witnesses:
J. L. Barry
A. F. Park

UNITED STATES PATENT OFFICE.

GEO. S. BOSWORTH, OF TROY, NEW YORK.

CAR-WHEEL.

Specification of Letters Patent No. 30,458, dated October 23, 1860.

To all whom it may concern:

Be it known that I, GEORGE S. BOSWORTH, of the city of Troy, in the county of Rensselaer and State of New York, have invented a new and useful improvement in such cast-iron railroad-car wheels as are each cast in one piece with a chilled rim and an undivided hub; and I do hereby declare that the following is a full and exact description thereof, reference being had to the annexed drawings, making a part of this specification, in which—

Figures 1, 2 and 3 are sections in the plane of the axes, and Figs. 4, 5 and 6 elevations, on a reduced scale, of three varieties of my improved car-wheel; and Fig. 7 is a full sized radial section of the wheel shown in Figs. 1 and 4.

The same letters refer to like parts in all the figures.

The beneficial result of my invention is the production of a cast-iron, rail-road car-wheel, cast in one piece with a chilled rim and an undivided hub connected together by a single plate or disk, which disk is so formed that the wheel, after being cooled down in a common unheated pit, or in the open air, is left with so little strain of tension or of compression, by the unequal rate of cooling and contracting of the different parts, that the wheel is, as I firmly believe, stronger to resist the lateral shocks and radial concussions to which it is subject in use, than any cast-iron car-wheel of equal size and weight previously made in one piece with a chilled rim and an undivided hub, at as cheap a rate.

In the annexed drawings, A is the rim or tread of the wheel; which rim is cast within a chill and in any suitable form for that part.

B is the hub, which is cast upon a core as usual, without being divided into segments to allow for shrinkage.

C is the disk or continuous plate which connects the rim to the hub, which plate is strongest to resist lateral shocks when made thickest toward the hub, as shown in Fig. 7. The plate, C, is undulating in form and has two or more annular waves concentric with the hub and the rim—that is, the plate C has, on each side, two or more annular elevations, *d*, alternating with annular depressions, *e*, the annular elevations of one side of the disk being opposite to the annular depressions of the other side, and concentric

with the rim and hub, substantially as represented in the annexed drawings. In Figs. 1, 4 and 7 the plate C is shown with two such waves; in Figs. 2 and 5 with three; and in Figs. 3 and 6, with four. I prefer to make the larger wheels with more waves than the smaller, two waves being generally considered best in wheels of 24 to 30 inches in diameter, three in those of 32 to 34, and four in wheels of 36 to 40 inches in diameter. But I do not limit myself to making wheels of those sizes with the particular number of waves just specified for each, nor to making the two or more waves of the plate C of the precise size, nor form shown, nor to uniting the rim and the hub to the particular parts of the waves to which they are shown joined in the annexed drawings, but shall vary these as circumstances shall render desirable. For the distinguishing feature of my improved car-wheel cast in one piece is the fact that the chilled rim is connected with the hub by means of a single undulating concavo-convex disk or plate having two or more annular waves which are concentric with the hub and rim, and are not crossed by any such braces or brackets cast on the side or sides of the plate as will prevent or materially interfere with the existence of substantially equal strength and yielding or springing capability in all radial sections which can be taken through the disk.

I am aware that a car-wheel has been previously cast in one piece with a chilled rim and an undivided hub connected together by a single disk which has an annular convexity on each face, but it is obvious that such a disk will yield or spring much less to the sudden contraction of the rim, without straining the metal in the disk, than a concavo-convex plate having two or more annular waves concentric with the hub and rim as shown in the annexed drawings, and I have found by experiment that a car-wheel cast in one piece with the chilled rim and the hub connected together by a disk of the last-named form, is greatly stronger to resist the shocks and concussions to which car-wheels are subject in use, than a wheel which has the chilled rim connected to the hub by a disk which simply has a convexity on each side concentric with the rim and hub. To get the necessary amount of yielding capability in the disk of a wheel, when the disk merely has a convexity on

each side, the convexities must project so far outside of the line of thrust between the rim and hub as to leave the disk too weak.

5 It is apparent that radial braces or brackets cast on the sides or side of the undulating disk which connects the rim and hub together, as shown in No. 18767 of United States patents, make some parts of the plate
10 or disk heavy or thick and others thin at equal distances from the center of the wheel so as to destroy the equality of strength and elasticity which should exist in all parts of the disk at equal distances from the axis,
15 and prevent the plate from yielding as evenly and as much as it otherwise would under the unequal rate of shrinkage of the various parts;—and it is essential to my improved wheel that the undulating plate,
20 C, thereof, or at least two of the waves of that plate, should be without such side-braces or brackets. It is also obvious that such car-wheels as are represented in the annexed drawings are essentially different
25 from such as have the rim and hub connected together by two disks, each having two or more annular waves concentric with the hub and rim; and also from such as have the hub connected to the rim by means
30 of two plates extending part way and one the rest, the plates being so formed that one or each of the faces of the wheel presents two annular waves concentric with the

hub. For in each of the two cases last named it is necessary to use a core in casting the plates which connect the rim to the hub, which use of the core increases the cost of the wheel, and those plates are not as free to yield or spring, and are consequently more liable to be strained or fractured by
40 the unequal rate of contraction of the various parts of the wheel in cooling, than the single undulating plate of my improved wheel herein described. It is also obvious that the plate of this wheel differs from a
45 plate, having any portion of it between the hub and rim flat in the radial line as such flat space would form an unyielding arch which would materially deteriorate from the yielding effect so perfectly provided for in
50 my wheel and in which its great strength and value consist.

What I claim as new and desire to secure by Letters Patent is—

The above described cast-iron car-wheel
55 cast in one piece with the chilled rim connected to the hub by means of a single undulating concavo convex plate which has two or more annular waves concentric with the hub and rim, substantially as represented
60 in the annexed drawings.

GEO. S. BOSWORTH.

Witnesses:

I. L. BARNEY,
A. F. PARK.