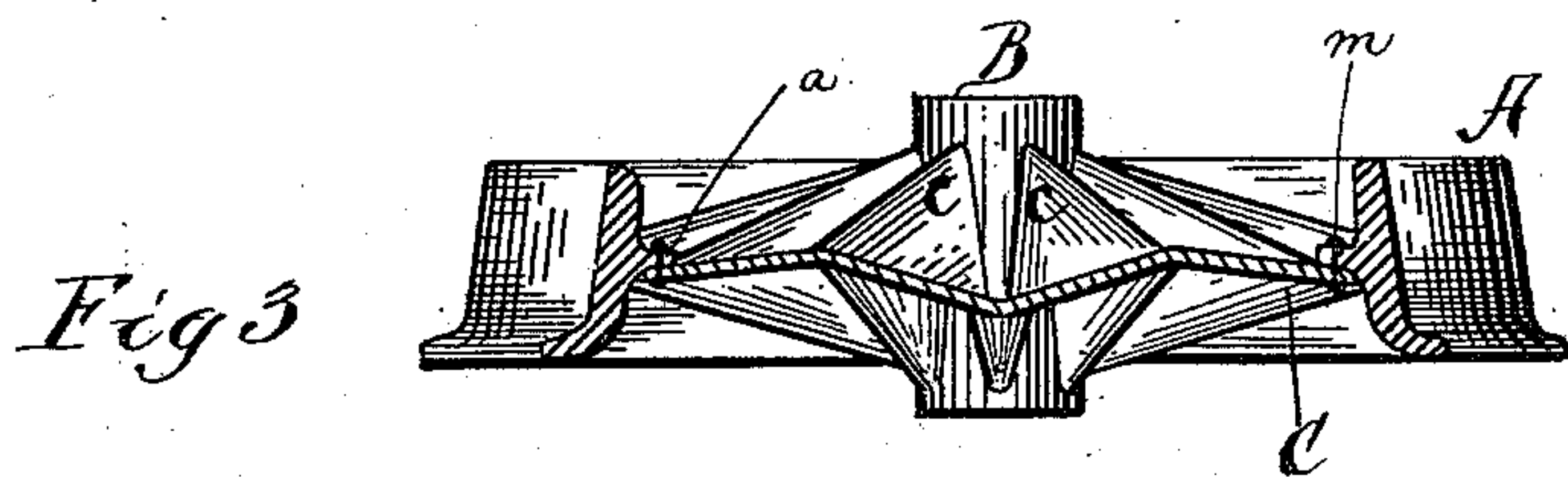
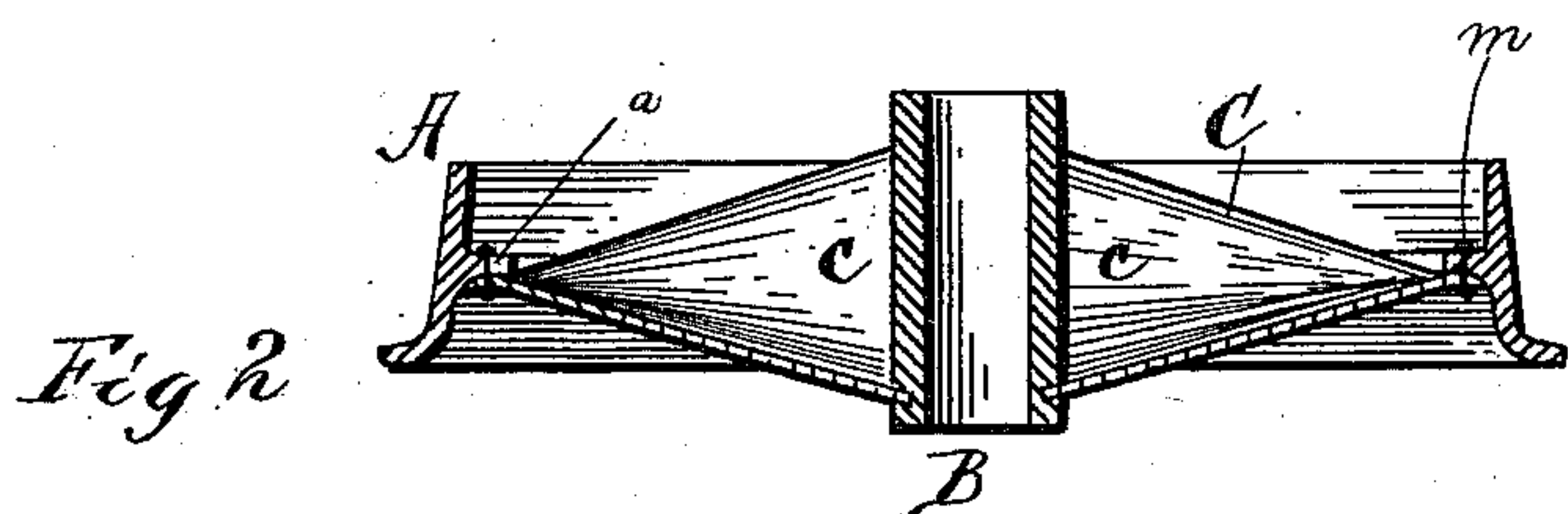
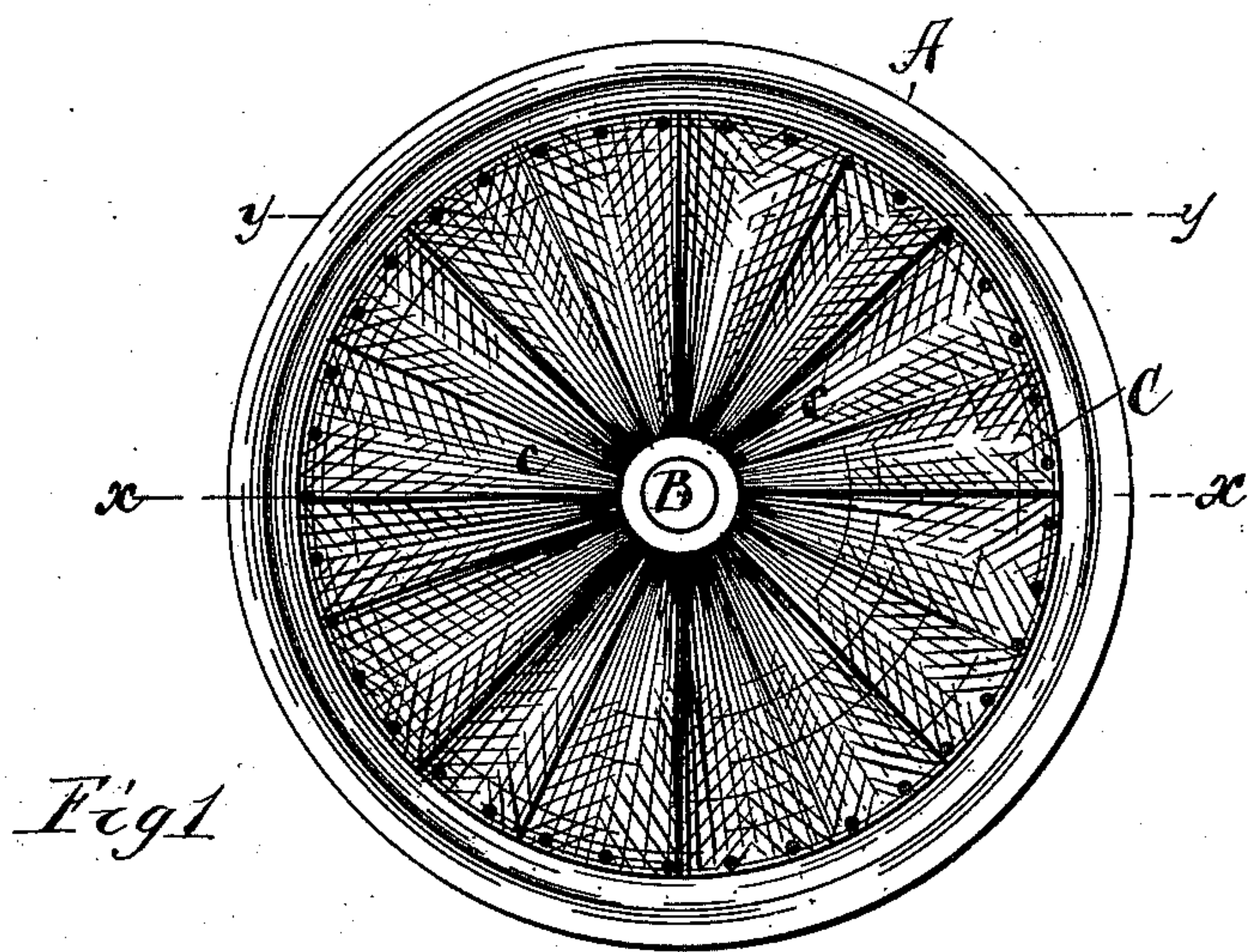


(No Model.)

W. E. WILLIAMS.
METAL WHEEL.

No. 418,634.

Patented Dec. 31, 1889.



Witnesses

W. C. Corlies
Harry Bitner.

Inventor

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UNITED STATES PATENT OFFICE.

WILLIAM E. WILLIAMS, OF CHICAGO, ILLINOIS.

METAL WHEEL.

SPECIFICATION forming part of Letters Patent No. 418,634, dated December 31, 1889.

Application filed March 14, 1889. Serial No. 303,283. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. WILLIAMS, a citizen of the United States of America, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Metal Wheels, of which the following is a specification.

Referring to the drawings, Figure 1 is a face view of one of my improved wheels; Fig. 2, a cross-section of the same in line $x x$ of Fig. 1, and Fig. 3 a cross-section in line $y y$ of Fig. 1.

My invention relates to that class of wheels in which the hub and rim or tire are connected by a web of sheet metal; and its object is to increase the strength, reduce the weight, and cheapen the manufacture of such wheels. To such end it consists in the construction and combination of parts hereinafter described and claimed.

In wheels of this class two difficulties arise; first, a flat web of sheet metal contains so little material immediately around the hub and supporting the same that any considerable weight is liable to crush the hub through the web; second, such a web offers scarcely any resistance to a strain at right angles to its face, and hence is easily destroyed by any pitching of the vehicle which it carries from side to side.

The simplest and most satisfactory expedient for overcoming the latter difficulty is to form the metal web into deep radial corrugations immediately around the hub of the wheel, tapering these corrugations toward the tire until, in some wheels, they disappear altogether. This makes a light and graceful wheel, and any degree of stiffness may be obtained by varying the depth of the corrugations. Wheels constructed in this manner have been made heretofore; but, so far as I am aware, they have been made by cutting out the web in the form of a flat annular plate fitting between the hub and rim, and then pressing or stamping it into the shape desired. In this construction it will readily be seen that as the web is cut from a flat sheet to fit the wheel and corrugations of varying depth then stamped therein the metal will be simply stretched or drawn out to form the corrugations, and the web will contain exactly the same amount of metal around the hub as

the original flat plate, so that nothing is gained toward overcoming the first difficulty above mentioned. Various attempts have been made to remove this fault, among which, perhaps, the most common is to re-enforce the central portion of the web by additional plates on one or both sides thereof. I prefer, however, to form the corrugations in the web without drawing out or lessening the thickness of the metal plate, and thereby increasing the amount of metal immediately around the hub in proportion to the depth of the corrugations. To do this I form the web of a piece of sheet metal cut, not to fit between the hub and rim, but in the shape of a segment of a ring of less curvature than the one it is to form when placed in the wheel, or, preferably, in the shape of a rectangular strip, and bringing it to the proper curvature by means of tapering corrugations formed therein, which are deeper at the inner edge than at the outer.

In the drawings, which present three views of a wheel constructed in the above-described manner, A is the rim, B the hub, and C the web connecting the two. The latter will be seen to contain corrugations c , of considerable depth at the hub, extending radially therefrom and tapering toward the rim. This web is here shown as cast into the hub; but it may be fastened thereto in any other way, if preferred. The corrugations are also shown as disappearing at the rim. This, however, is not essential, as it is only necessary that they be deeper around the hub than at the rim. In wheels of this sort great difficulty has been encountered in combining with a web of the kind described a rim of suitable metal to withstand the wear and strain to which it is subject.

In my improved wheel I make the web and tire separately, forming upon the inner surface of the latter an inwardly-projecting flange a , place the web in the tire with its outer edge resting upon this flange, and rivet the two securely together. This construction makes the web and tire practically integral, while at the same time it is possible to use any preferred metal for the tire. The latter, also being made separately, can be made stronger and more perfect than if formed with the web from the same metal. This

rigid fastening of the web and tire is important for another reason—namely, that it gives the wheel the combined strength of a “suspension” and a “thrust” wheel, enabling it
5 to carry more than twice the weight that would otherwise be possible.

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

A metal wheel composed, essentially, of a
10 metal hub, a web of sheet metal brought to

the required curvature by means of tapering corrugations therein, substantially as described, and suitably fastened to said hub, and a metal rim riveted to said web, as and for the purpose stated.

WILLIAM E. WILLIAMS.

Witnesses:

HARRY BITNER,

W. M. HILL.