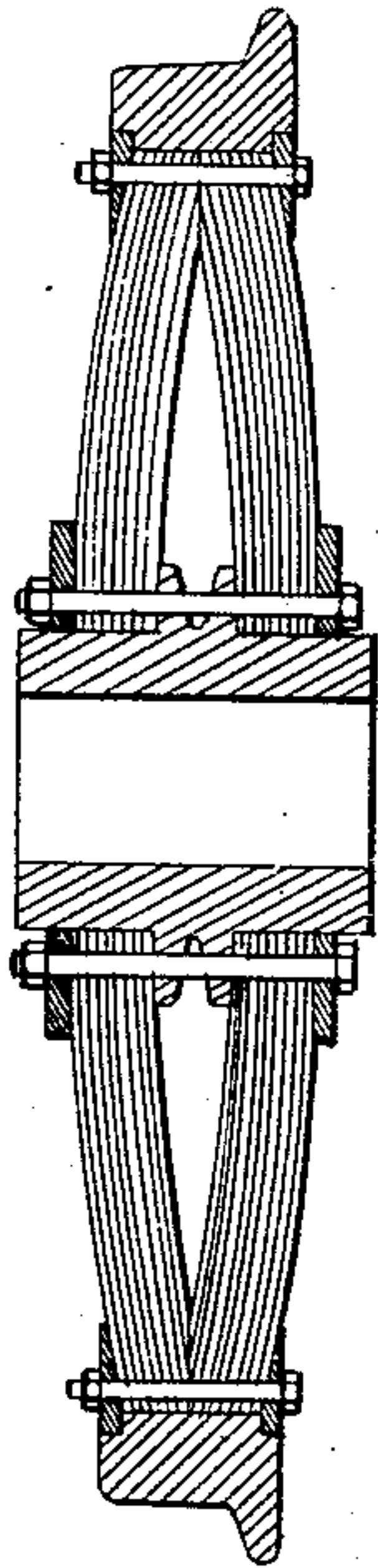


Z. S. DURFEE.  
Car-Wheels.

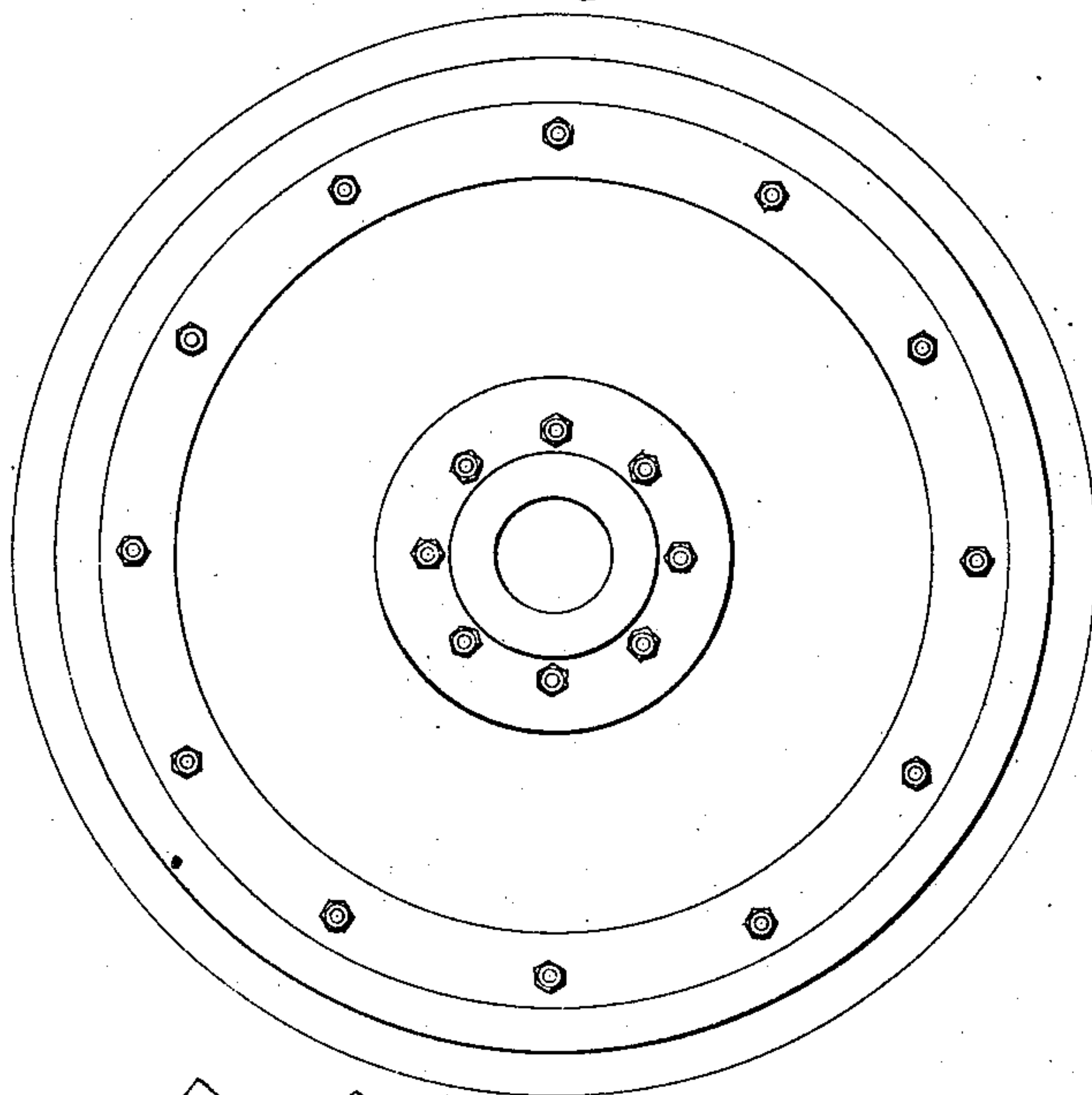
No. 155,433.

Patented Sept. 29, 1874.

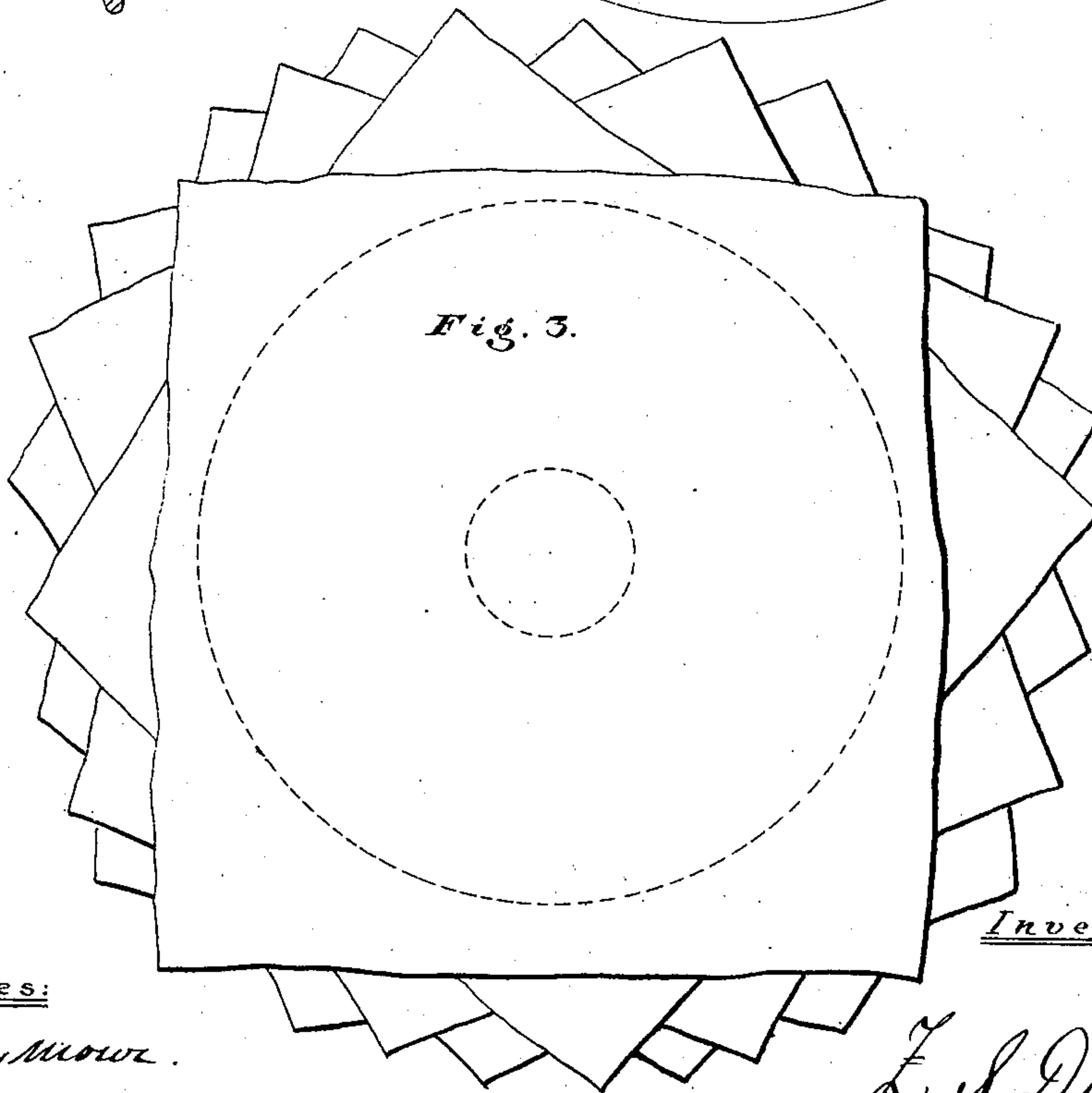
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



Witnesses:

*Wm H. Seymour.*

*J. D. White.*

Inventor:

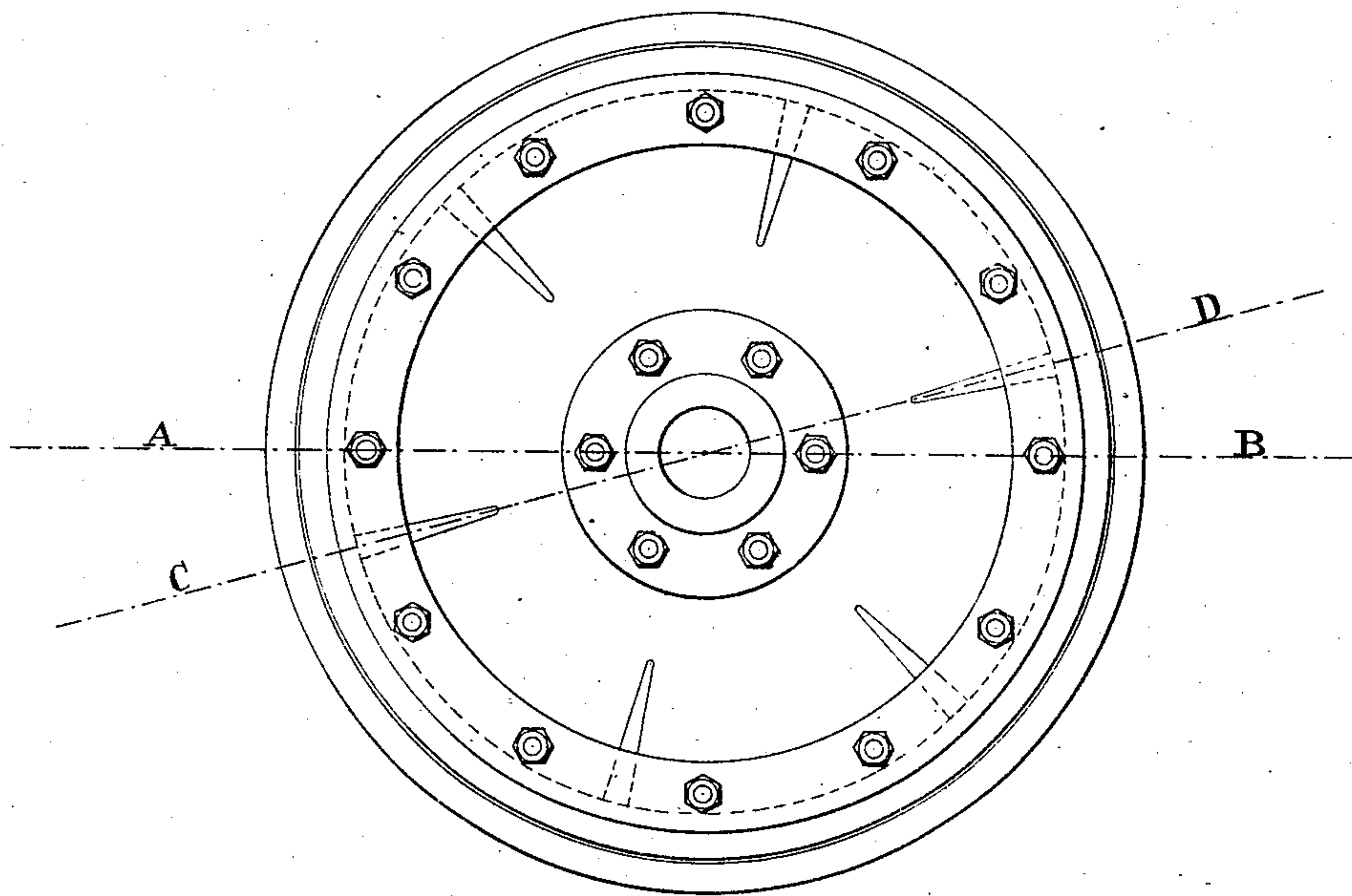
*Z. S. Durfee*

**Z. S. DURFEE.**  
**Car-Wheels.**

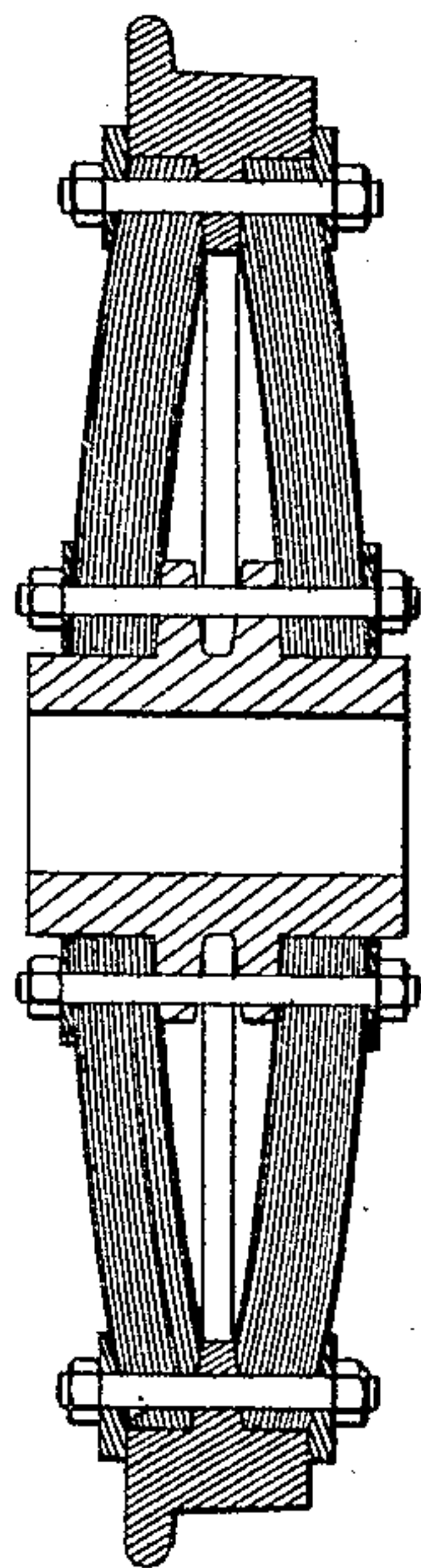
No. 155,433.

Patented Sept. 29, 1874.

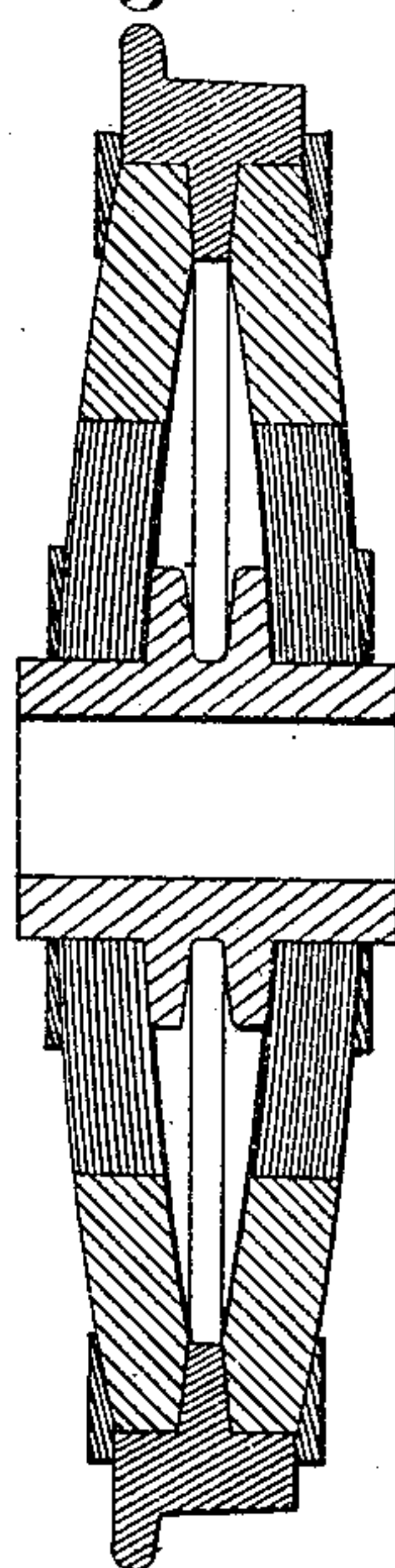
*Fig. 4*



*Fig. 5.*



*Fig. 6.*



Witnesses:

*Wm H. Seymour*

*J B White*

Inventor:

*Z. S. Durfee*



# UNITED STATES PATENT OFFICE.

ZOHETH S. DURFEE, OF NEW YORK, N. Y.

## IMPROVEMENT IN CAR-WHEELS.

Specification forming part of Letters Patent No. **155,433**, dated September 29, 1874; application filed December 4, 1873.

*To all whom it may concern:*

Be it known that I, ZOHETH S. DURFEE, of the city and State of New York, have invented certain Improvements in Wooden Disks used in the Manufacture of Car and other Wheels, and in the manufacture of such wheels, of which the following is a specification:

My invention consists in making the wooden disks of wheels which are made up of iron or steel tires, iron hubs, and wooden plates or disks, of thin veneers of wood, glued or cemented together in such wise that the grain or fibers of no two veneers shall run in the same radial direction, or so, at least, that they shall run in the same direction only exceptionally, and at intervals of several layers of the veneers; and also in the combination of such disks with iron hubs and iron or steel tires, substantially as hereinafter described, and shown in the accompanying drawings.

I am aware that numerous attempts have been made to produce car-wheels with wooden disks which have resulted more or less satisfactorily, but no such wheels have been continuously successful in this country, because, from the way in which they have been manufactured, the trying nature of our climate, with its frequent changes of temperature and moisture, has caused the wooden portion of such wheels to swell, shrink, and warp, and generally to break up and become unsafe. Nearly all such wheels have been made of sectors of wood of greater or less width and considerable thickness, glued or fastened together radially so as to break joints, but not making in any wise a continuously solid and homogeneous disk or plate, as my plan does.

I am also aware that sectors of wood have been built into car-wheels so as to present an appearance similar to the general effect of my wheel; but in all such cases there were radial joints in the several layers of the wooden disks made up of these sectors, and no such homogeneity as I produce.

In making the disks on my plan I prefer to use very thin veneers, and such as are made by turning thin sheets of wood off from a revolving log rather than the sawed veneers; but veneers made in any wise may be used.

Figure 3 in the accompanying drawings shows the manner in which I place the ve-

neers one upon another, and they may be cemented or glued together by any of the glues or cements now used for joining wood.

The veneers should be placed under a press after the glue or cement has been applied and the requisite number have been piled together, and the disks may be pressed flat or be dished, as may be desired.

Previously to being used the veneers may be seasoned or prepared to resist decay and shrinkage in any of the usual modes, and either or both of the surfaces of the disks may be covered with oiled paper, or any thin metallic foil or covering which may be suitable, either for the more complete protection of the wood from the weather, or for the ornamentation or finish of the disks.

After being suitably glued and pressed together the disks may be dried, or in other wise seasoned, and then be turned or cut into the desired shapes and sizes, and finished for use in any convenient way.

In pressing or molding the disks into shape I prefer to use dies which may be kept hot by circulation of water or steam, or in any other desirable way.

Figs. 1 and 2 show one plan of constructing car-wheels with my wooden disks, which will be clearly understood without any further explanation by all familiar with such work.

Instead of bolts with nuts I may use bolts riveted over washers in the usual way.

Figs. 4, 5, and 6 show another plan of construction, in which the bolts clamping the tires pass through flanges on the insides of the tires; and in these figures the wooden disks have first been made flat, and V-shaped slits have been sawed radially into their edges, so as to enable them to be sprung into their places in the wheels.

These slits should be filled with rubber, wool, cotton, or any suitable elastic material, before the disks are sprung into the wheels, partly to prevent the ingress of any foreign matters and water, and partly to add to the elasticity of the wheel.

In some cases it may be convenient to substitute, for the continuous disks made as herein described, sectors made either by sawing up radially disks made on my plan, or sectors made by gluing or cementing suitable pieces

of veneers together, so as to prevent any radial parallelism of fiber, the point aimed at in my invention being to make wooden disks, whether in one piece, as cemented together of different layers of veneers, or composed of sectors so cemented together, which, when once placed in the wheel, will not warp or shrink and become loose; and, in case the disks are made up of sectors, as herein just described, I prefer to place between the edges of these sectors, when they are put into position in the wheel, strips of rubber or other elastic material, as previously described with reference to the V-shaped slits.

In making car-wheels with these wooden disks I prefer to use two sets of disks, as shown; but my disks are equally applicable to the manufacture of wheels with one disk only.

I claim—

1. As a new article of manufacture, a wooden disk for a car-wheel, concave in form, and constructed from thin veneer plates of wood, united in the manner described, the grain of one veneer crossing the grain of another at any desired angle, substantially as and for the purpose described.

2. A car-wheel formed by combining two wooden concave disks of veneer with an iron hub and an iron or steel tire, substantially as and for the purpose set forth.

3. In combination with a wheel formed of two wooden concave disks of veneer, united to an iron hub and tire, an elastic packing set radially in a V-shaped slit in the edge of the wooden disk, as and for the purpose set forth.

Z. S. DURFEE.

Witnesses:

WM. H. SEYMOUR,  
J. B. WHITE.