

(No Model.)

2 Sheets—Sheet 1.

R. N. ALLEN.

CAR WHEEL.

No. 396,721.

Patented Jan. 29, 1889.

FIG. 2

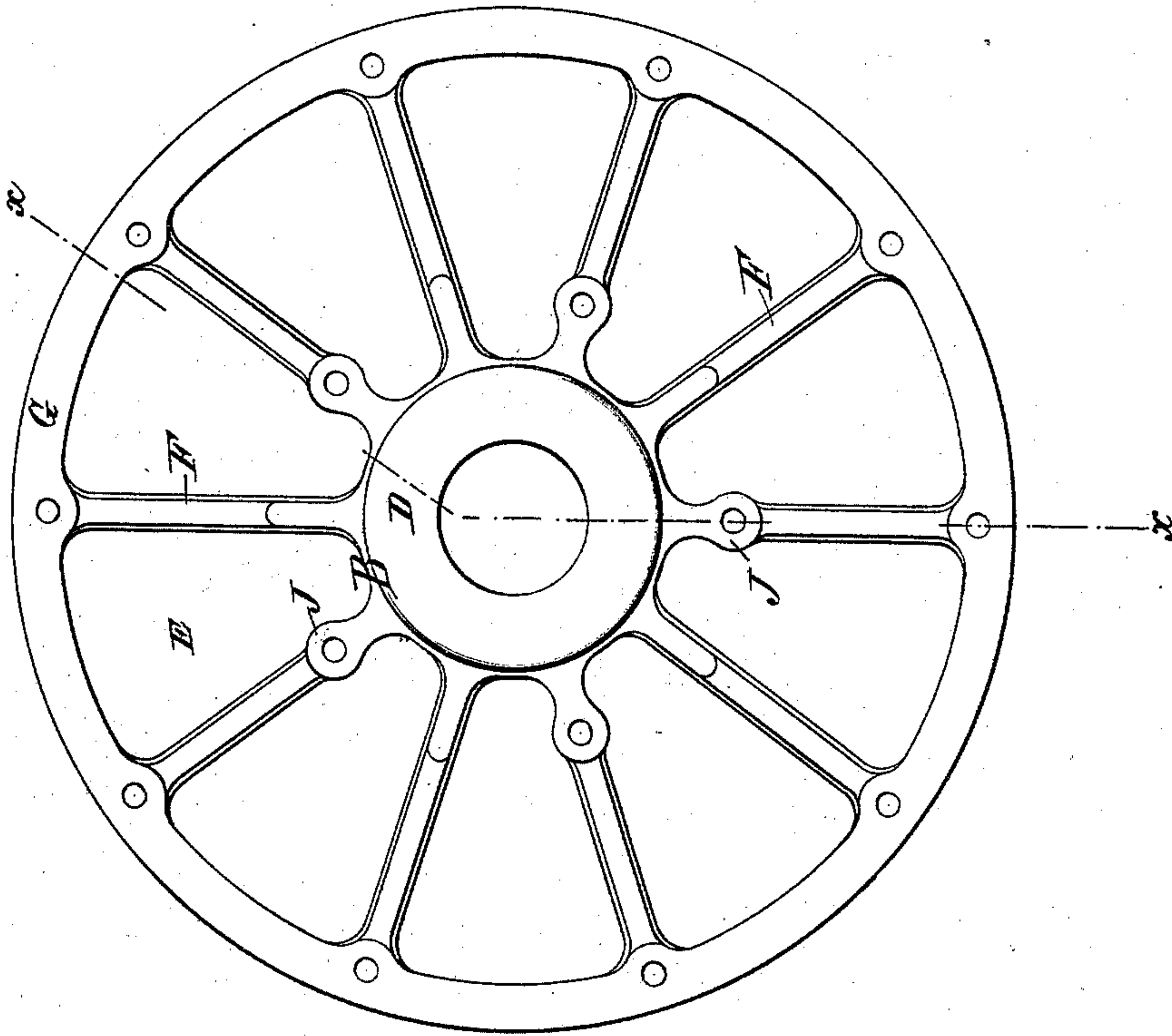
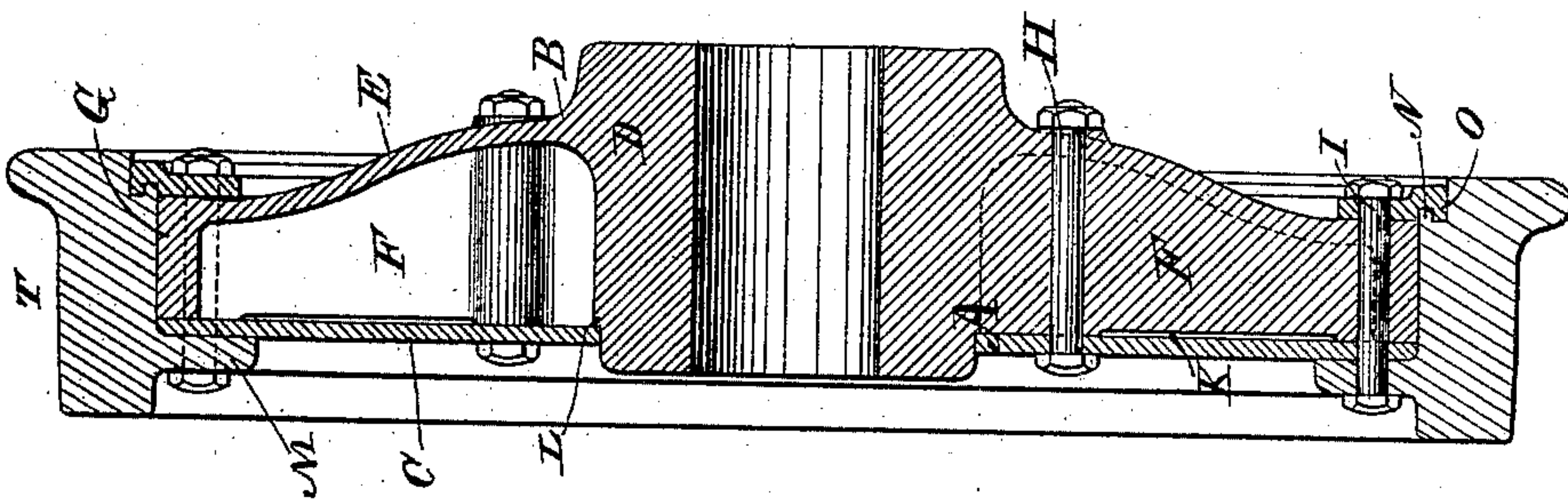


FIG. 1



WITNESSES:

Raphael Netter.
Robt. H. Duncan

INVENTOR

Richard N. Allen

(No Model.)

2 Sheets—Sheet 2.

R. N. ALLEN.

CAR WHEEL.

No. 396,721.

Patented Jan. 29, 1889.

FIG. 3

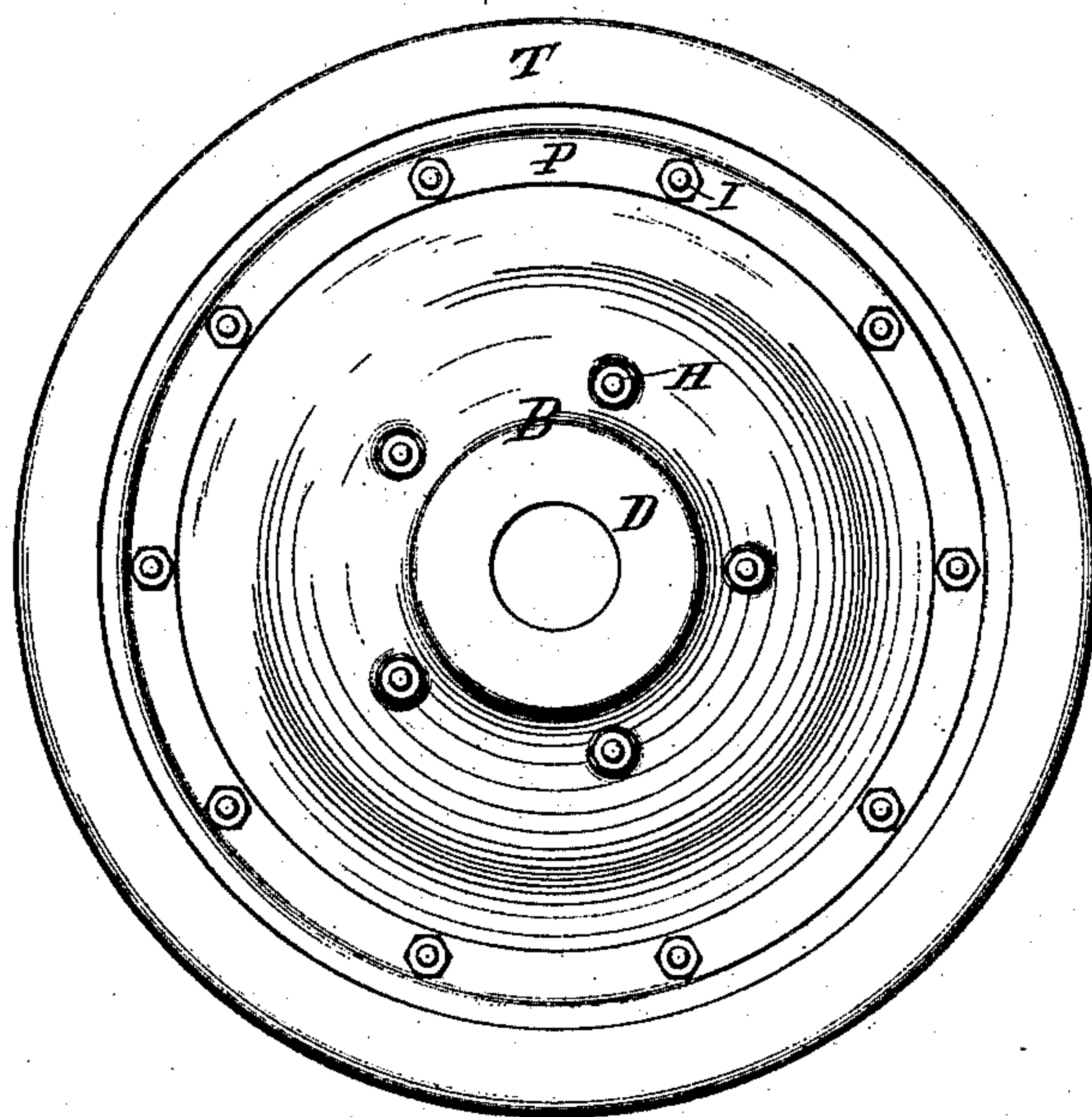
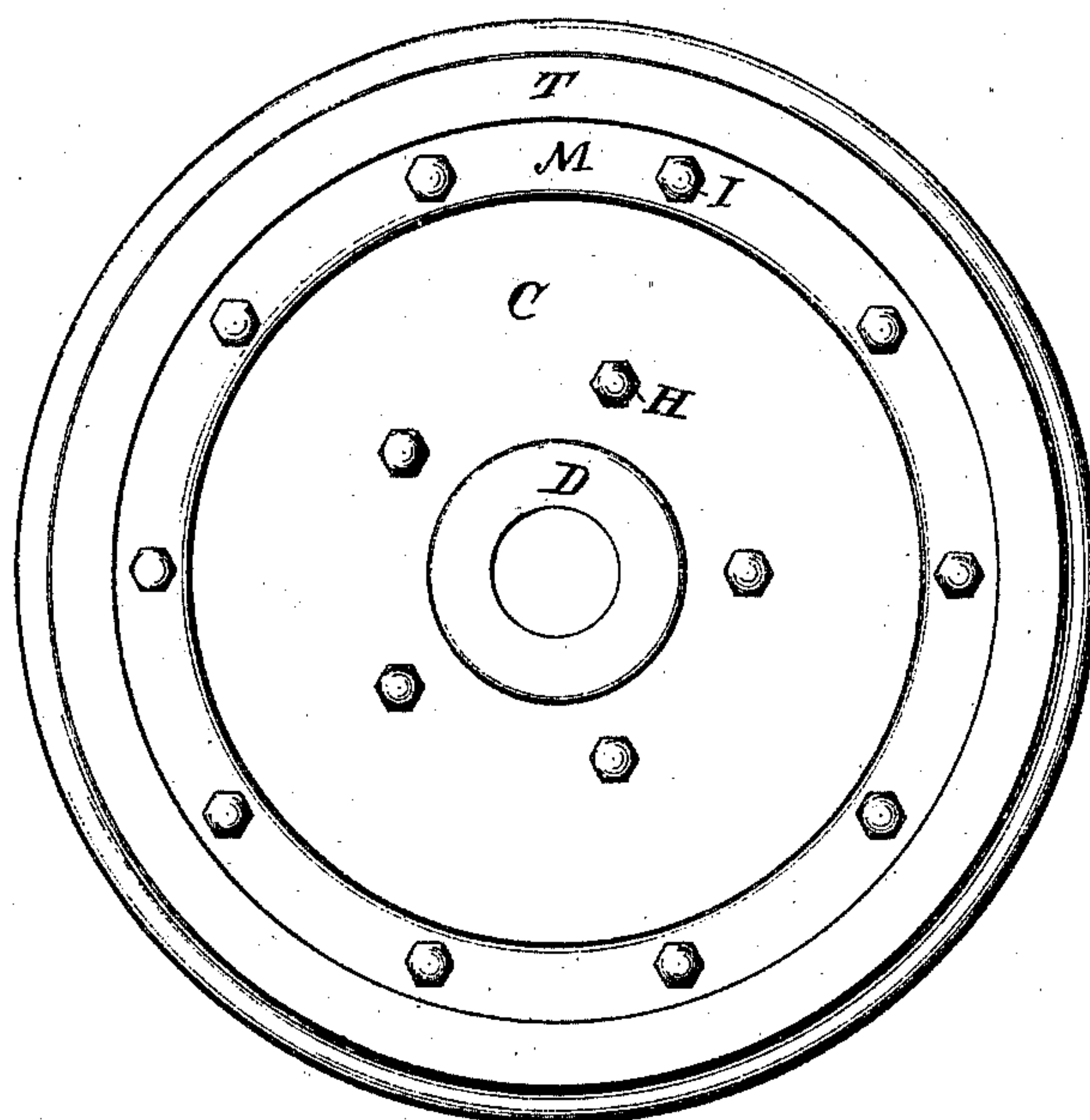


FIG. 4



WITNESSES:

Raphael Netter

Robt. H. Duncan

INVENTOR

Richard N. Allen

UNITED STATES PATENT OFFICE.

RICHARD N. ALLEN, OF CLEVELAND, OHIO.

CAR-WHEEL.

SPECIFICATION forming part of Letters Patent No. 396,721, dated January 29, 1889.

Application filed June 14, 1888. Serial No. 277,113. (No model.)

To all whom it may concern:

Be it known that I, RICHARD N. ALLEN, a citizen of the United States, residing at the city of Cleveland, in the county of Cuyahoga, in the State of Ohio, have invented certain new and useful Improvements in Car-Wheels, of which the following is a full, clear, and exact description.

The present invention belongs to that class of car-wheels in which the tire and the center or body of the wheel are made in separate parts and are united together; and it relates especially to the construction of the center or body of the wheel, which is composed of two main or principal parts secured together by bolts or rivets, these parts being of such shape that when united they will leave a space or spaces between them and form hollow car-wheel centers.

Heretofore hollow car-wheel centers, independent of the tire, have been made of a single piece by casting, or of two parts or side pieces practically one, since they are inseparably united in the process by which they are made. The former, or those cast in a single piece, have been made both with and without cross-ribs or stays; but the objections to such car-wheel centers with cross-ribs or stays, as heretofore made, are many and serious. The process of manufacture is expensive and attended with considerable difficulty, owing to the fact that cores conforming to the hollow parts of the centers must be prepared for each casting, and great care must be exercised in properly making and placing them in the mold for the casting operation, and after the metal is poured the cores must be broken up and expelled through openings formed in the sides, rim, or hub, which openings tend to detract from the strength of the wheels. It has also been proposed to secure to opposite sides of a web or central portion of a car-wheel side plates by means of rivets or bolts for the purpose of strengthening the wheel; but in such cases the said web, the tire, and the hub have been cast in one piece.

It is the object of the present invention to obviate the defects above referred to in the manufacture of hollow car-wheel centers, and to produce a car-wheel which shall have all

the advantages in strength and lightness which is possessed by the most approved car-wheel whose center is cast in a single piece, and to accomplish this at a considerable saving of time and expense.

My invention is illustrated in the accompanying drawings, which show my preferred construction of car-wheel, and in which—

Figure 1 is a central section of a car-wheel along the line xx of Fig. 2. Fig. 2 is a view in elevation of the car-wheel center with one side plate removed. Fig. 3 is an elevation of the inner side or face of the completed wheel, and Fig. 4 is an elevation of outer side or face thereof.

In the drawings, A represents the center or body of the wheel, which includes the entire wheel except the tire. This center is made up of two main or principal parts, B and C, of which B is made of cast metal, generally of iron or steel, and preferably includes the hub D, the side plate, E, the cross ribs or stays F, and the main part of the rim G. The other part, C, forms the other side plate of the center, and is preferably made of wrought iron or steel, and is firmly united to the part B by bolts or rivets H and I. The part B can be readily cast in an ordinary mold prepared in any of the usual ways well known to workers of cast metal. No prepared cores are required, but only an ordinary pattern of the part B, which can be easily molded in sand and readily drawn therefrom and will form a perfect matrix to receive the molten metal and form the part B.

It is preferred that the series of bolts or rivets H nearest the hub of the wheel should pass through the ribs or stays F, and for this purpose a part of the ribs may be enlarged along this line, as designated by J in Fig. 2 of the drawings, to provide a body of metal sufficient to receive bolt-holes of the requisite size. If there are as many ribs as are shown in the drawings, one bolt to every other rib, at points adjacent the hub, will be sufficient to bind the parts of the center securely together. So, also, the ribs where they join the rim G are enlarged for the same purpose. The edges of the ribs F, which are adjacent the side plate C, need not be in contact with that plate throughout the whole length of the

ribs; but the central or middle parts lying between the outer and inner series of bolts or rivets may be, and preferably should be, stopped off, so as to leave open spaces K between these edges and the adjacent plate. This will save considerable expense, which would be incurred if these edges were finished to form a close joint with the plate. The parts of the edges of the ribs which are adjacent the hub and rim should be turned off or faced to furnish even and smooth surfaces, against which the inner face of the plate C will fit and make close joints.

It is not essential that the ribs or stays F should be continuous from the hub to the rim, so as to divide the interior of the center into a series of closed chambers; but in addition to the openings K there may be other openings through these ribs near the hub or rim or at their central parts, the design and purpose of the ribs being simply to strengthen the wheel against both lateral and radial strains.

The side plate C is preferably made from wrought iron or steel rolled out to the desired thickness and cut to the proper size and shape. This plate is applied to the part B, so that its inner periphery is in contact with the hub and preferably abuts against a shoulder, L, formed thereon, while the part near its outer periphery overlaps the edge of the rim G. The series of bolts or rivets H secures the parts B and C together and completes the center, which is hollow, or has a space or spaces inclosed by the parts B and C.

The tire of the wheel (designated by T in the drawings) is preferably of steel and rolled to the proper size and shape, and is secured to the center or body of the wheel in any desired manner. Preferably the tire is formed with an inwardly-projecting web, M, located near its outer edge, and with a tongue, N, and groove O located near its inner edge.

P is an annulus or ring provided with a tongue and groove corresponding with the tongue N and groove O on the tire and adapted to engage therewith.

A tire constructed as above described is applied and secured to the center of the wheel as follows: The inner bearing or contact surface of the tire and the outer periphery or edge of the center are turned off or faced to conform and make a close joint, and the tire is placed onto the center, so that the web M will overlap the plate C near its periphery and be in close contact therewith. The ring P is then forced into position. Holes for bolts I can then be bored in the proper places through the web of the tire, the plate C, the rim G, and the ring P, and the bolts inserted, and the several parts drawn and firmly held in close and secure contact by means of the nuts. I do not, however, wish to limit my invention to a tire of any special construction or secured to the center or body in any special manner.

If the part B of the center is cast from

steel, the ring P may be cast with the part B, and these parts form a single casting or piece. In this case the groove in the part P, which is filled by a tongue on the tire, can be readily cut or grooved out by the proper turning-tools.

In the above description and in the accompanying drawings the outer side plate C is a separate piece secured by bolts or rivets to the part B, which is cast in a single piece. It is evident that this construction could be reversed by making slight changes in the shape of the side plates, so as to make the separate side plate C the inner plate instead of the outer one, and in such case the outer side plate, the hub, cross-ribs, and rim would form a single casting.

It is evident that in addition to the economy in manufacture above referred to a car-wheel whose center or body is constructed with one of its side plates of wrought iron or steel and the remainder of cast-iron, these parts being securely bolted together, will necessarily be stronger to resist the strains and shocks to which it is subjected than if made in substantially the same shape and of the same weight of metal, but wholly of cast-iron, as has heretofore been customary; also by this construction both sides of the casting can be fully inspected and any flaws or imperfections be detected, which is not practicable in hollow centers cast in a single piece. I do not, however, desire to limit my invention to making the center partly from cast and partly from wrought metal or steel, as it is evident that by increasing the thickness of the side plate C it could be formed by casting and make a practical wheel. This would, however, increase the weight of the wheel, and would in that respect be less desirable. Neither do I desire to limit my invention to the forming of the rim G or the ribs F integral with the part B, as it is evident that if the parts B and C were both formed by casting the rim G and the cross-ribs F might be formed either wholly or in part upon either of these parts.

What is claimed as new is—

1. A hollow car-wheel center adapted to receive a tire, consisting of a hub, rim, side plates, and cross-ribs or stays, and composed of two separable main or principal parts or pieces united together by bolts or rivets, substantially as and for the purpose set forth.

2. A hollow car-wheel center adapted to receive a tire, consisting of a hub, rim, side plates, and cross-ribs or stays, and composed of two separable principal parts or pieces secured together by bolts or rivets, one of which parts is of cast metal, while the other is of wrought iron or steel, substantially as and for the purpose set forth.

3. A hollow car-wheel center adapted to receive a tire, composed of two separable principal parts secured together by bolts or rivets, one of said parts being of cast metal, and forming the hub, rim, and one side plate with

cross-ribs or stays, while the other part is of wrought iron or steel and constitutes the opposite side plate, substantially as and for the purpose set forth.

5 4. A car-wheel composed of a tire and a substantially hollow center formed in separate parts and united together, the center containing a hub, rim, side plates, and cross-ribs or stays, being composed of two principal
10 parts or pieces secured together by bolts or rivets, substantially as and for the purpose described.

15 5. A car-wheel composed of a tire and a substantially hollow center formed separately and united together, the center containing a hub, rim, side plates, and cross-ribs or stays, being composed of two principal parts or pieces secured together by bolts or rivets, one

of which parts is of cast metal and the other of wrought iron or steel, substantially as and 20 for the purpose set forth.

6. A car-wheel composed of a tire and a substantially hollow center formed separately and united together, the center being composed of two principal parts or pieces secured 25 together by bolts or rivets, one of which parts is of cast metal and contains a hub, rim, and one side plate, and the other part is of wrought iron or steel and is the other side plate, substantially as and for the purpose set 30 forth.

RICHARD N. ALLEN.

Witnesses:

ROBT. H. DUNCAN,
PARKER W. PAGE.