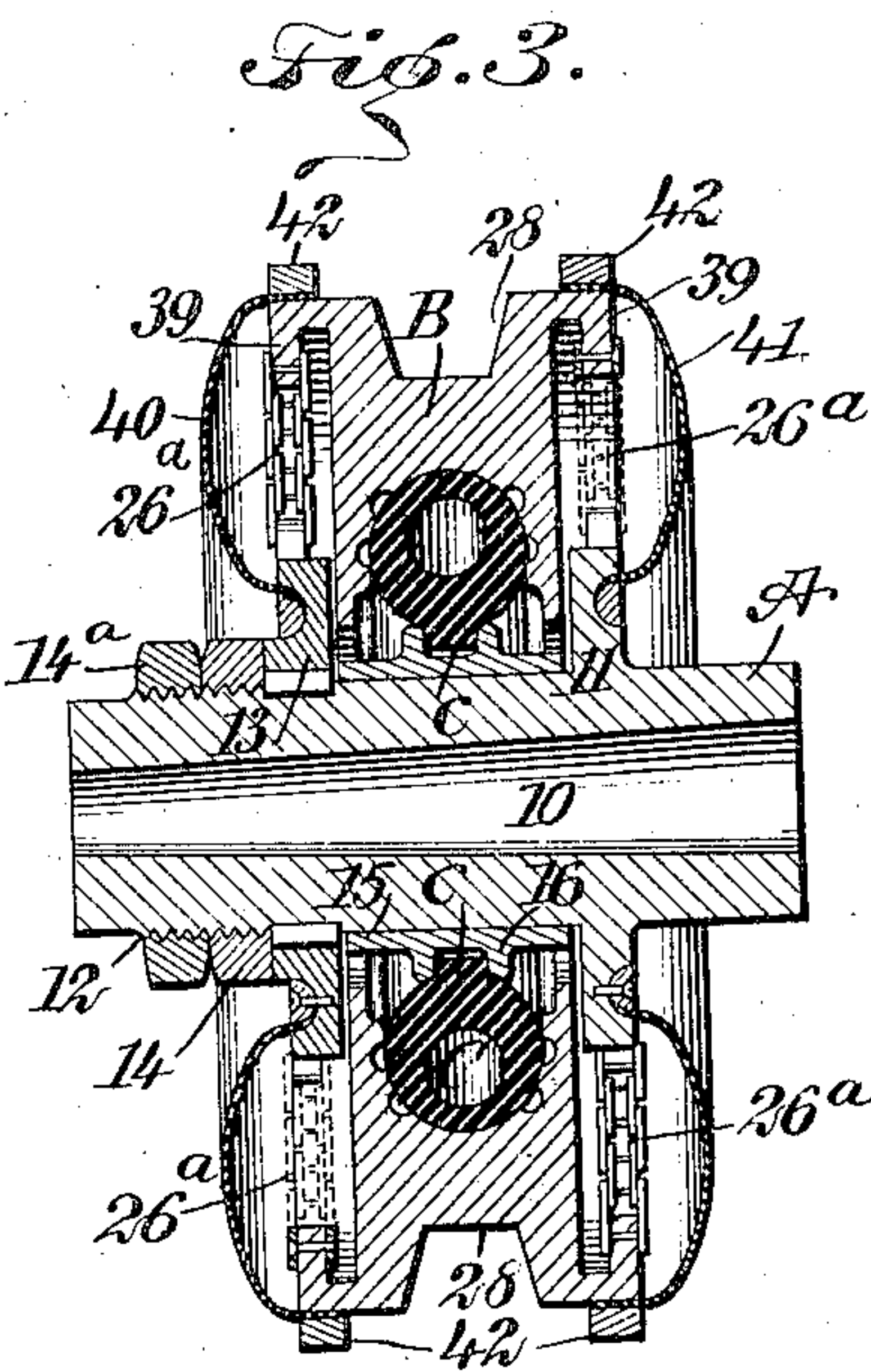
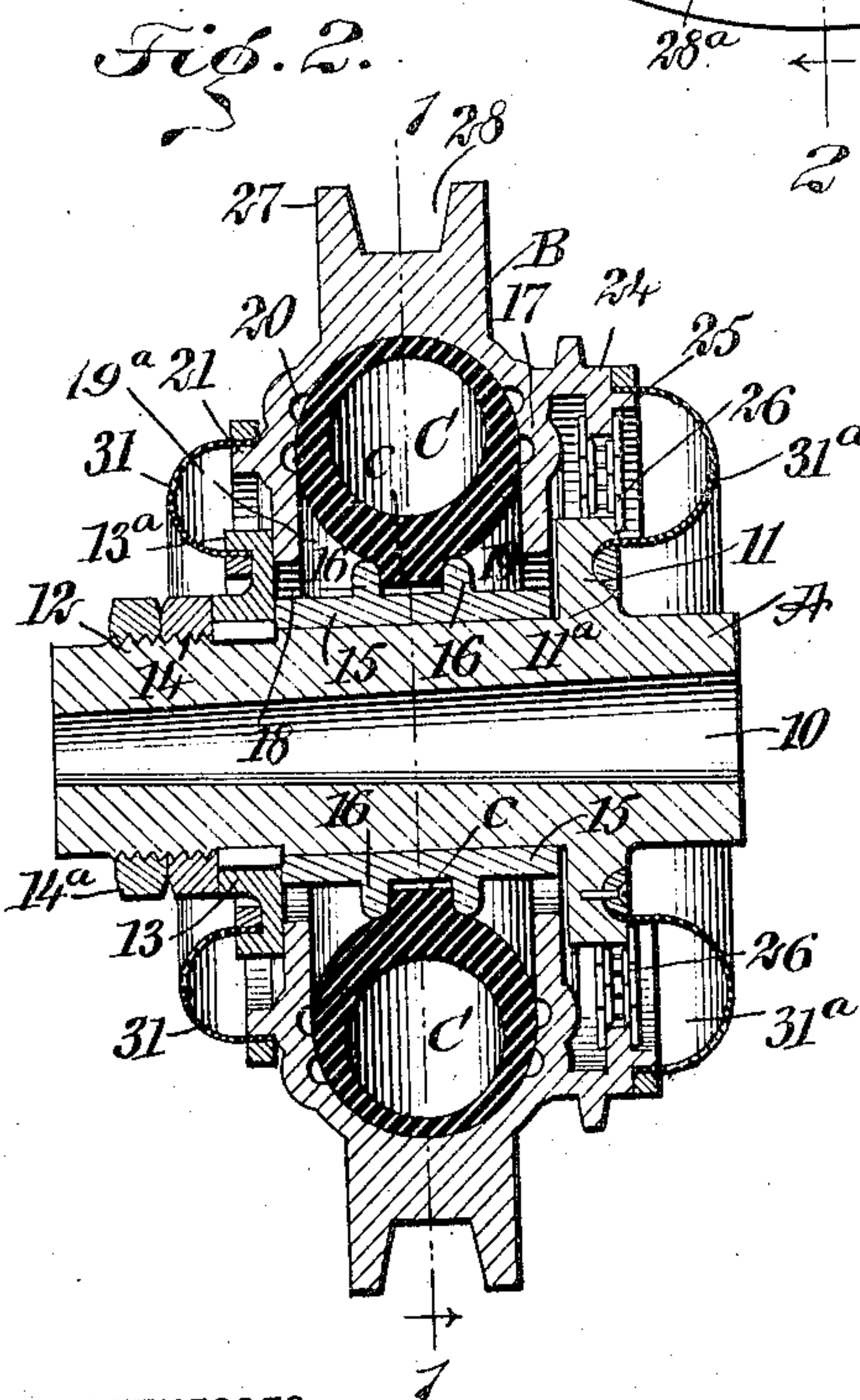
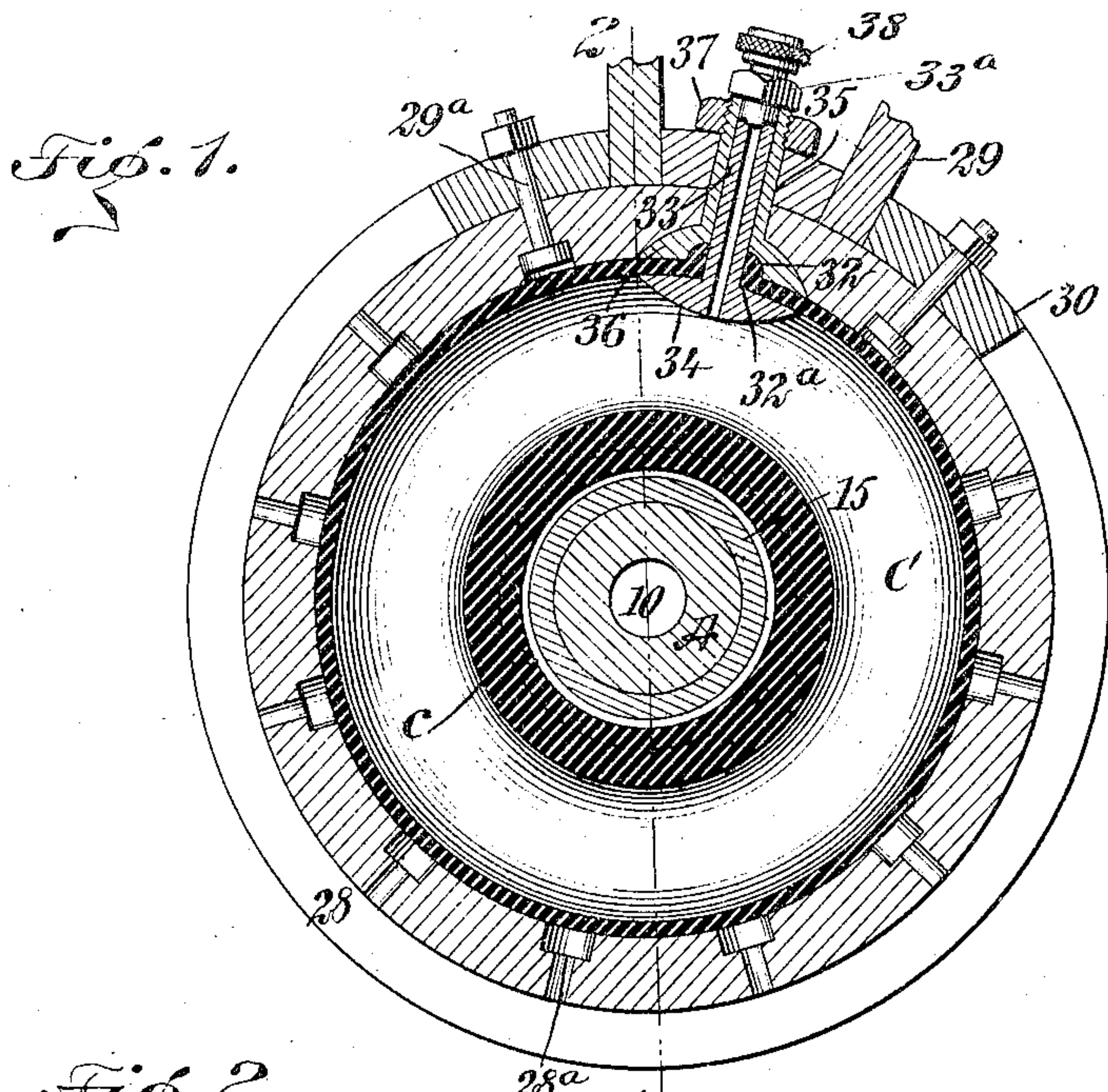


No. 812,629.

PATENTED FEB. 13, 1906.

M. G. BABIO.  
VEHICLE WHEEL.  
APPLICATION FILED AUG. 31, 1905.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

MANUEL GONZALEZ BABIO, OF NEW YORK, N. Y.

## VEHICLE-WHEEL.

No. 812,629.

Specification of Letters Patent.

Patented Feb. 13, 1906.

Application filed August 31, 1905. Serial No. 276,562.

*To all whom it may concern:*

Be it known that I, MANUEL GONZALEZ BABIO, a subject of the King of Spain, and a resident of the city of New York, borough of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Vehicle - Wheels, of which the following is a full, clear, and exact description.

My invention relates to an improvement in vehicle - wheels, and particularly to an improvement in the construction of the wheel for which I have made an application for patent, filed March 6, 1905, Serial No. 248,479, and the purpose of the invention is to avoid friction between the flanges of the primary hub and the sides of the secondary hub, so as to adapt the above-named construction in the most satisfactory manner to light and high - grade vehicles, which adaptation will give more comfort to their occupants than that attained in vehicles now in use, and this is accomplished by changing the shape and construction of the pneumatic tube located between the primary and the secondary hubs, providing said tube with an inner chamber which has an eccentric relation in cross-section to the circular exterior outline of the tube, and in further providing the pneumatic tube with an integral rim at the exterior face of its inner portion, the said rim being adapted to enter an annular pocket at the exterior of a check or guiding collar mounted loosely upon the primary hub, the outer and the inner portions of the side surfaces of the said pneumatic tube fitting snugly within the secondary hub, which hub has limited play to and from the primary hub, whereby when tension takes place in direction of the rim of the pneumatic tube such tension overcomes to a certain extent the tension which will take place at the sides of the tube and whereby also the pneumatic tube will be kept substantially in normal shape when it is inflated, and at the same time the tube will work without undue lateral motion, as the wall in the chamber in the secondary hub receiving said pneumatic tube is more or less grooved or serrated in order that it may be held firmly to said hub by means of exterior ribs formed in the pneumatic tube and coinciding with the grooved or serrated portion of the hub when the tube is inflated with air.

The invention consists in the novel con-

struction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a vertical section through the hub of the improved wheel, the section being taken substantially on the line 1 1 of Fig. 2. Fig. 2 is a vertical section through the hub of the wheel, the section being taken at right angles to that shown in Fig. 1 and on line 2 2 of Fig. 1; and Fig. 3 is a section corresponding to the section shown in Fig. 2 and taken through the hub of a wheel slightly modified in form.

A represents the primary hub of the wheel, and B the secondary hub, which is adapted to turn around the primary hub, being separated therefrom a predetermined distance. The primary hub is provided with a tapering bore 10 to receive the spindle of an axle, and adjacent to the inner end of said primary hub A an annular flange 11 is exteriorly produced, said flange having an annular concave groove 11<sup>a</sup> in its outer face, as is shown in Fig. 2. The opposite or outer end of the primary hub A is provided with an exterior thread 12, and between the center of the primary hub and the said thread a flange 13 is keyed or otherwise secured on said primary hub facing the flange 11. These two flanges 11 and 13 are not in contact with the secondary hub, to be hereinafter described, and which lies between them, there being, for example, a space or clearance of one-sixteenth or one-eighth of an inch between said flanges and the secondary hub, and said flanges 11 and 13 may be properly denominated the "heads" for the primary hub, one head being stationary and the other removable. The removable head 13 is held in position on the hub A by suitable nuts 14 and 14<sup>a</sup>, screwed upon its threaded portion 12. The head 13 is provided with an annular outwardly-extending marginal flange 13<sup>a</sup> for a purpose to be hereinafter described.

A collar 15 is mounted to turn on the primary hub A between the heads 11 and 13, having slight play in direction of said heads—for example, an eighth or a sixteenth of an inch, so as to correspond with the space above mentioned as existing between the heads 11



and 13 and the secondary hub; but it should be understood that if in practice it is found that the best results can be obtained by making the collar 15 of equal length to the distance between the heads, so as to make a permanent contact of the ends of the collar with said heads the construction will be so carried out. This collar may be termed a "check" or "guiding" collar, since it will in the latter case, in connection with the pneumatic tube, to be hereinafter described, keep in central position the primary hub in relation to the lateral motion that will take place when the vehicle is in motion, such lateral motion being limited to the space or clearance between the heads 11 and 13 and the secondary hub. The collar 15 is provided with two annular ribs 16, located at each side of the center, and the space between these ribs constitutes a pocket where the pneumatic tube C engages and is located between the secondary hub B and said collar 15. Said ribs 16 are preferably made rounded at their outer edges in order that they may not do any harm to said pneumatic tube, as is clearly shown in Figs. 2 and 3.

The body 17 of the secondary hub B is of such dimensions that a space 18 normally intervenes on each side between the inner edge of the said secondary hub and the collar 15, as is also shown in Figs. 2 and 3, and in the inner face of the body of said secondary hub B an annular chamber 19 is formed, whose side walls are straight, the outer wall of said chamber being arched or semicircular in formation, as is shown in Figs. 2 and 3. In the side walls of the said chamber 19, adjacent to the outer wall of said chamber, grooves or serrations 20 are preferably made, said grooves or serrations being annular. It may here be mentioned that said chamber 19 is subdivided by the pneumatic tube, forming annular spaces at the sides of its exterior inner portion, there being one space at each side provided for the play of the collar 15 in connection with said pneumatic tube, as will be explained hereinafter, which spaces are designated in the drawings as 19<sup>a</sup>. In the further construction of the body portion 17 of the secondary hub an annular flange 21 is made at its outer side face, as is shown in Fig. 2, and, as is also shown in the same figure, another flange 24 is produced at the opposite or inner side face of said secondary hub, extending at a right angle from the hub and then inward in direction of the flange 11 of the primary hub. This inner flange 24 is provided with an exterior annular flange 25, extending from its inner face.

Under the construction shown in Fig. 2 the primary and the secondary hubs A and B are connected at their inner portions by chains 26, attached to the peripheral portion of the

fixed head 11 and to the inwardly-extending portion of the inner flange 24, and adjacent chains are made to extend in opposite directions from the said head 11—as, for example, one forwardly and the other rearwardly; but, as has been described in the application above referred to, I may use chains only on one side or on both sides of the hub, as may be required.

A pneumatic tube C is located between the two hubs A and B employed in connection with the collar 15, intervening between the primary hub and the said pneumatic tube, the latter being thickest at its bottom or inner portion, gradually diminishing in width or thickness until the upper portion is reached, where the thickness is uniform. Thus in cross-section the chamber in the pneumatic tube C is more or less eccentric with respect to the cross-sectional circular contour of the said tube, as is clearly shown in Fig. 2.

At the inner central portion of the pneumatic tube C a rim or an annular flange c is formed integral with the tube, and this annular flange or rim c is adapted to enter the space between the annular ribs 16 on the collar 15. When the secondary hub is fitted in position relative to the primary hub, it has practically the same play between the heads 11 and 13 on the primary hub as does the collar 15 of the latter; but, as stated above, in practice it is found more convenient the lateral play of the collar between the heads may be avoided by making the said collar long enough to turn in contact with the heads. A space is normally made to intervene between the inner face of the rim or flange c of the pneumatic tube and the bottom of the pocket formed between the ribs 16, as is illustrated in Figs. 2 and 3.

The secondary hub B, as shown in Fig. 2, is provided with an annular outer section 27, which is integral with the body 17, and in the periphery of this outer section 27 an annular groove 28 is formed, the sides whereof taper inward in direction of each other, and the said groove 28 is adapted to receive the inner ends of the spokes 29, which are separated and are held in position by spacing-blocks 30. In the outer or peripheral wall of the chamber in the secondary hub B apertures 28<sup>a</sup> are made, leading into the groove or trough 28, as shown in Fig. 1, and adapted to receive bolts 29<sup>a</sup>, likewise shown in Fig. 1, which bolts pass through the spacing-blocks 30 and are provided with suitable nuts at their outer ends.

A dust-guard 31, made of any suitable material, preferably a pliable material, is secured to the outer faces of the two hubs by resting the inner edges of said guards upon the flange 21 at the outer face of the secondary hub and against the under face of the outer flange 13<sup>a</sup> of the head 13 of the pri-



mary hub and placing rings in engagement with the said edges, which rings are secured to said flanges, while an opposing dust-guard 31<sup>a</sup>, which is larger than the opposite dust-guard 31, is held by placing one of its edges on the flange 25 of the secondary hub, holding it in place by a suitable ring, and placing the other edge of the dust-guard in engagement with the grooved portion 11<sup>a</sup> of the fixed flange 11 of the primary hub, this portion of the dust-guard being also held in position by a suitable binding-ring.

The pneumatic tube C is provided with an opening 32<sup>a</sup>, exteriorly surrounded by a boss 32, integral with said tube, and the stem 33 of an inflating-valve is passed through said opening 32<sup>a</sup>, which stem at its inner end is provided with an integral disk 34, through which the stem is carried, and this disk 34 engages with the inner face of said pneumatic tube, as shown in Fig. 1. The outer end of the stem 33 is threaded to receive a nut 33<sup>a</sup>, and a sleeve 35 is passed over the stem 33. Said sleeve 35 is provided at its lower end with an integral disk 36, which receives the boss 32 and which connects with the outer face of said pneumatic tube immediately over the inner disk 34. The said sleeve 35 and the stem 33 are carried out through a suitable aperture in the peripheral wall of the chamber of the secondary hub and out through a spacing-block. The outer end of the sleeve 35 is exteriorly threaded to receive a nut 37, so that this sleeve serves the same purpose as a bolt 29<sup>a</sup> and likewise protects the stem of the valve, and in tightening up the nut 33<sup>a</sup> against the sleeve 35 the pneumatic tube is firmly bound between the two disks 34 and 36. A suitable cap 38 is provided for the outer end of the valve-stem 33.

The construction shown in Fig. 3 is practically the same as that shown in Fig. 2, but the size of the parts are somewhat reduced, so as to render the combination made by the primary and secondary hubs of the wheel lighter and more compact. The operation of the combination of hubs shown in Fig. 3 is identical with the operation of the combination of hubs shown in Figs. 1 and 2. The difference consists in the shape of the secondary hub shown in Fig. 2, which is made with round shoulders projecting on its sides, while the secondary hub B (shown in Fig. 3) has no round shoulders and is made consistent in width throughout. The said difference further consists in the fact that the chains 26<sup>a</sup> are employed to connect the two hubs A and B at both their inner and outer sides; the chains at one side extending in one direction and the chains on the other side in an opposite direction, and the secondary hub B is provided at each side of its outer margin with an annular flange 39, having an inwardly-extending member. The outer ends of the

chains 26<sup>a</sup> are attached to these flanges. The dust-guards 40 and 41 are attached to the heads 11 and 13 in practically the same manner as under the construction shown in Fig. 2, but are secured to the secondary hub B by suitable rings 42, which clamp the material of the dust-guards to the outer peripheral marginal surfaces of the flanges 39.

The ribs 16 are made rounded in order that the collar 15 may not do any harm to the pneumatic tube C. By reason of the peculiar formation of the pneumatic tube and the coacting ribbed collar 15 and since the air-pressure in the tube C acts about the same in all directions when the rim or flange c of the said pneumatic tube is forced toward the pocket formed by the ribs 16 the tension taking place in this direction will overcome to a great extent the tension that would otherwise be sustained at the sides of the pneumatic tube C. In practice the two peripheral ribs 16 will be placed at the proper distance one from the other, so as to attain equilibrium of tension caused by the air-pressure acting on the portion of the pneumatic tube opposite to the pocket and the pressure acting on the adjacent sides of said pneumatic-tube portion, and thus the equilibrium referred to will be obtained, and at the same time the pneumatic tube will keep its normal shape as far as it is practically desired when it is inflated with air. It is understood that in practice the normal dimensions of the said pneumatic tube will be calculated so as to obtain the greatest expansion or dilation caused by the air-pressure at its inner portion when said tube is inflated with air at the required pressure, whereupon said inner portion will be in contact with the ribs 16 of the collar 15 to the required degree of tightness, and under these conditions the pneumatic tube will work without undue lateral motion. To further secure this latter object, the grooves 20 are made in the chamber 19 of the secondary hub, and by these means when the tube C is inflated the pressure forces the rubber of the tube into the said grooves, and in this manner annular ribs are formed in the pneumatic tube by means of the air-pressure acting toward the grooves made in the secondary hub, and thus the pneumatic tube is held so firmly in the secondary hub that no undue lateral motion at its lower or interior portion can take place, there being ample room for expansion and contraction of said tube C to take place in the annular chambers 19<sup>a</sup> and the space or pocket between the ribs 16 of the collar 15. The space between the inner edge of the secondary hub and the collar 15 allows free eccentric play of the primary hub to and from the secondary hub, and the space or clearance between the heads 11 and 13 and the sides of the secondary hub avoids all friction between these parts as far as practically



desired. Should it happen that any great shock should throw the vehicle to one side or the other, the head 11 or 13 on the primary hub will come in contact with said secondary hub, and such shock would die there and immediately all the working parts would take their normal positions.

It will be understood that this invention consists of all the parts and elements described in my previous application above referred to and that said parts and elements in this present invention are exactly the same as those described in said previous application, with the exception of the pneumatic tube, the check-collar, and the modification of grooves or serrations made in the secondary hub described and claimed as new in this application and that I may use in the wheel described in my previous application some or all of the parts or elements described as new in this application, and vice versa.

It will be observed that the improved pneumatic tube C as described in connection with the collar 15 and their relation to the two hubs A and B, as described, serve to accomplish all the results attainable by a cushioned or pneumatic tire at the rim of the wheel, while at the same time the pneumatic tube C is completely and thoroughly protected from undue wear and absolutely protected from puncture. It is evident that this tube being far distant from the ground and intervening between the two hubs trepidations transmitted to the wheels from the ground when the vehicle is in motion cannot be transmitted to the primary hub and vehicle with as much intensity of trepidation as with a pneumatic tire at the rim of the wheel, and therefore said pneumatic tube C by reason of its position mitigates or deadens the shocks to a great extent, affording more comfort to the occupants of the vehicle than can be obtained in the use of wheels fitted with pneumatic tires, as has been stated in the preamble of this specification.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In vehicle-wheels, the combination with a primary and a secondary hub, one loosely mounted relatively to the other, chain connections between the hubs, limiting their movement in opposite directions, a pneumatic tube located between the two hubs, being sustained by the outer hub and provided with an inner annular flange, and a check or guiding collar loosely mounted on the inner hub, having annular offsets between which the flange of the pneumatic tube is received.

2. In vehicle-wheels a primary hub having inner and outer heads, as described, a check or guiding collar loosely mounted on the primary hub between the heads, a secondary hub mounted loosely between the heads and

having movement to and from the said collar around which it extends, a pneumatic tube secured by inflation within the secondary hub in connection with the annular grooves therein, and means carried by the said collar for gripping the said tube, the latter being provided with an integral boss around the opening adapted for the stem of an inflating-valve, and being also provided with an integral rim at the central inner portion.

3. In vehicle-wheels, a primary hub as described, heads for the same, a check-collar loosely mounted on the primary hub between the heads, having movement in direction of the heads, a secondary hub provided with an inner chamber, which secondary hub extends between the heads of the primary hub, having play between said heads corresponding to the lateral play of the said collar, the said chamber being provided with a segmental peripheral wall and straight side walls, a pneumatic tube located within the chamber of the secondary hub, the chamber of which tube in the cross-section of the tube is eccentric to its outside circular surface and the upper side portions of the tube being closely fitted to the corresponding walls of the chamber in the secondary hub, and extensions from the said collar, which extensions receive between them a portion of the said pneumatic tube, a space for play being provided between such portions of the pneumatic tube and the collar.

4. In vehicle-wheels, the combination of a primary hub and a secondary hub, both directly connected by members denominated a check-collar and a circular pneumatic tube intervening between said hubs, heads attached to the primary hub, the said heads connecting with chains leading directly to the secondary hub and connected thereto, the check-collar being capable of slight movement in the direction of the heads, or said collar being in contact with the heads and in this case being without said movement, an annular rib exteriorly located on the collar at each side of its center, the secondary hub being mounted to move freely eccentrically and laterally at the same time between the heads, the eccentric movement being limited by the pneumatic tube and the lateral movement limited by said heads, and at the same time the said hub being capable of circular movement to one side or the other, this movement being limited by the chains connecting the hubs, the inner edge of the secondary hub being normally spaced from the said collar, said secondary hub being provided with a chamber in its inner face having its peripheral wall concaved, its side walls straight and the upper portions of the side walls provided with annular grooves, and the pneumatic tube fitted to the concaved wall of said chamber of the secondary hub and the grooved



portions of the side walls of said chamber, said tube being thickest at its inner portion and provided at its inner portion with an annular rim or flange which enters the space between the ribs of said collar, an annular space 5 intervening between the said rim and the opposing surface of the collar, and another annular space being made to intervene between the sides of the inner portion of said pneu-

matic tube and the corresponding opposite 10 surface of the collar, for the purpose specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

MANUEL GONZALEZ BABIO.

Witnesses:

J. FRED ACKER,  
JNO. M. RITTER.