

No. 814,293.

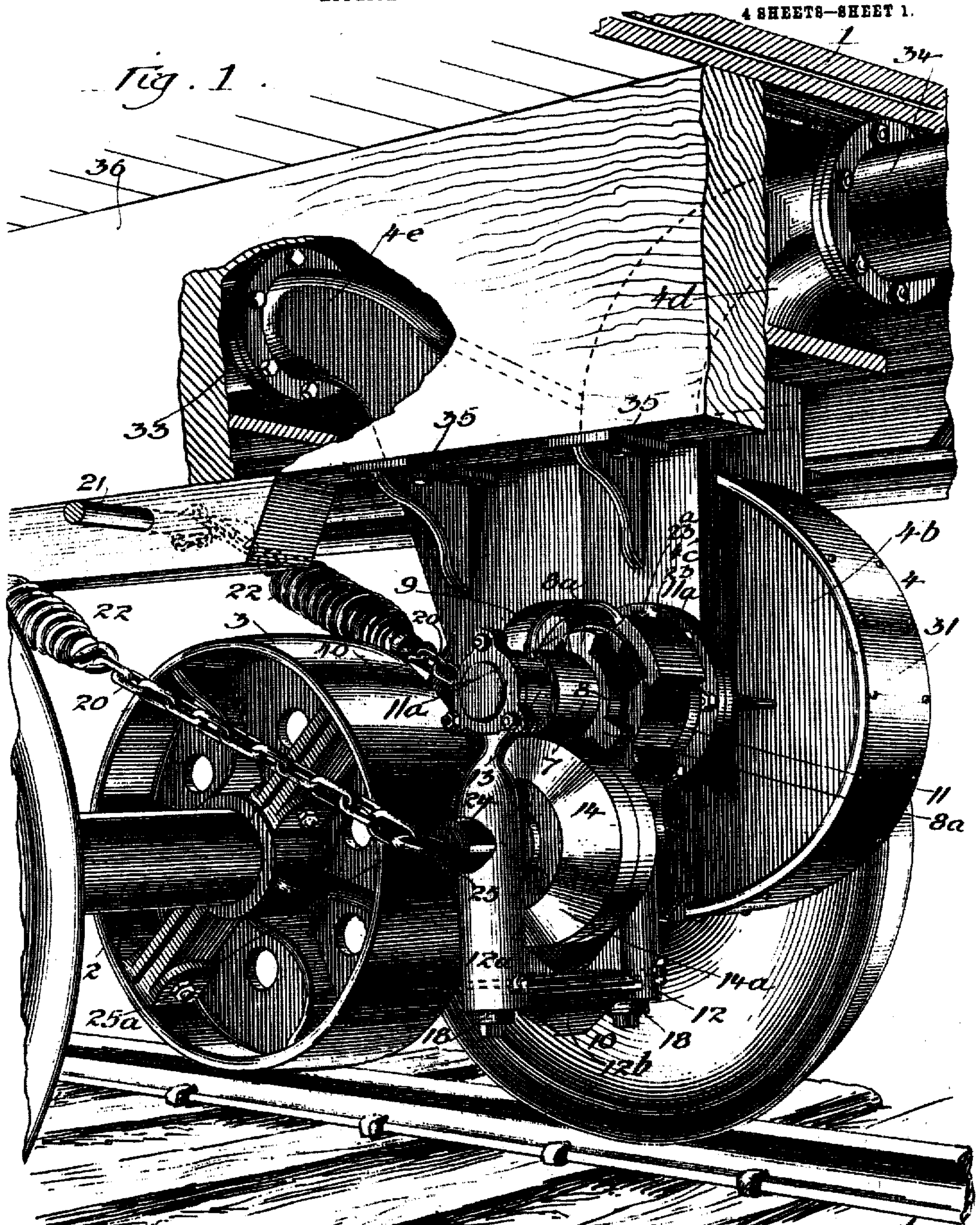
PATENTED MAR. 6, 1906.

D. E. JOHNSON.

MECHANISM FOR TRANSMITTING POWER FROM CAR AXLES.

APPLICATION FILED JULY 7, 1905.

4 SHEETS—SHEET 1.



Witnesses:
James H. Blanchard
Fred G. Fischer

Inventor:
Dellbert E. Johnson
By Burton & Burton
Attorneys.

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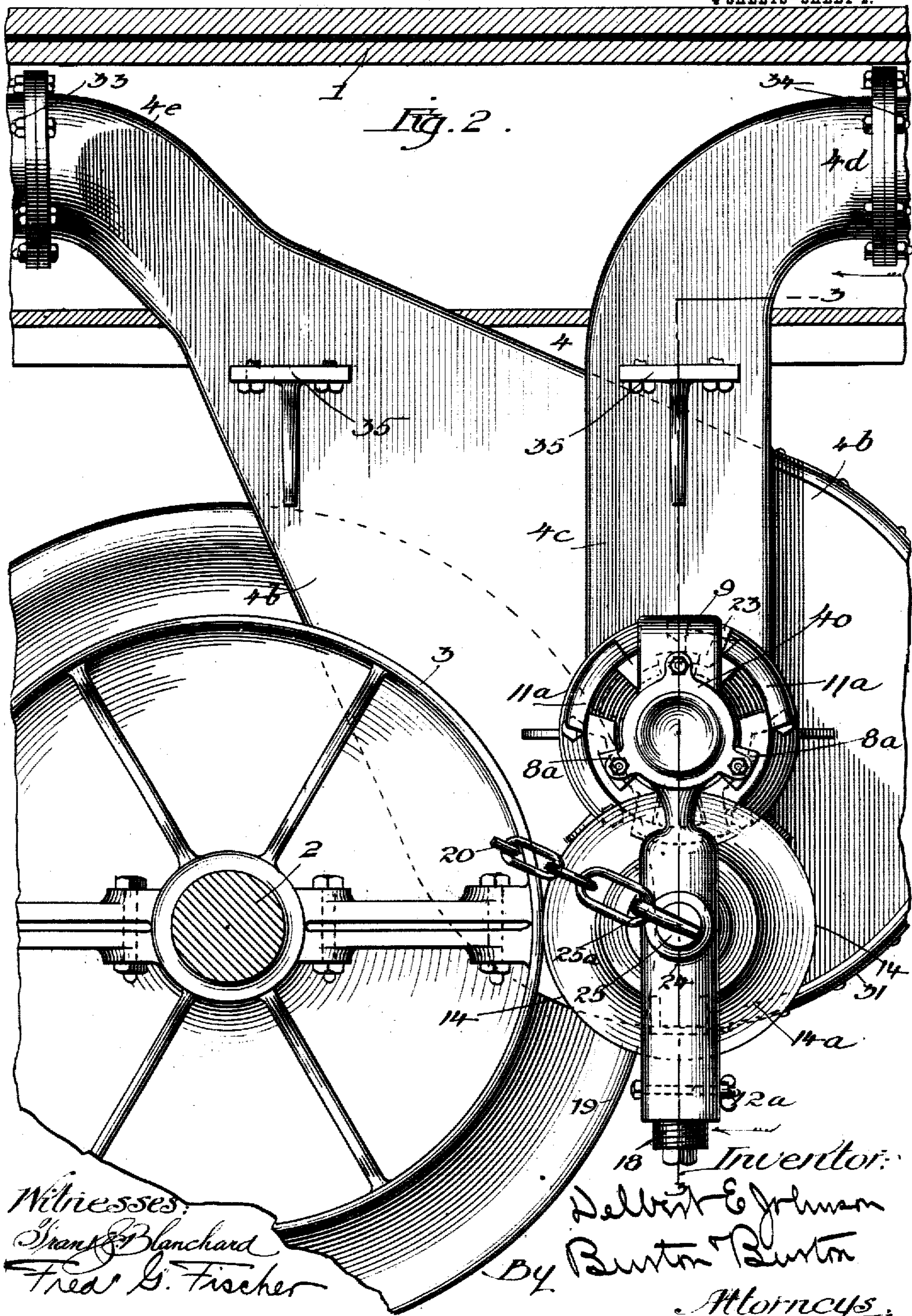
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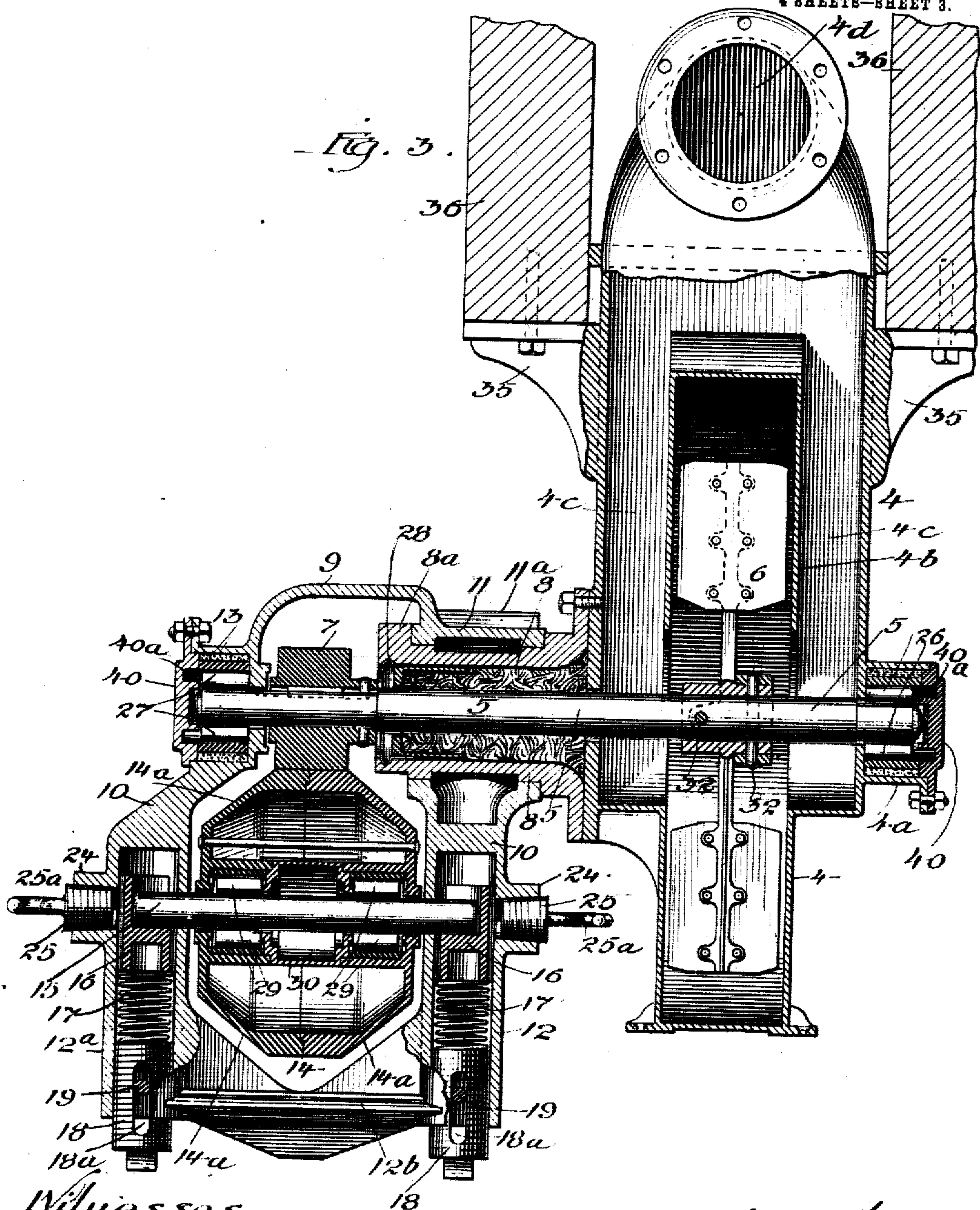
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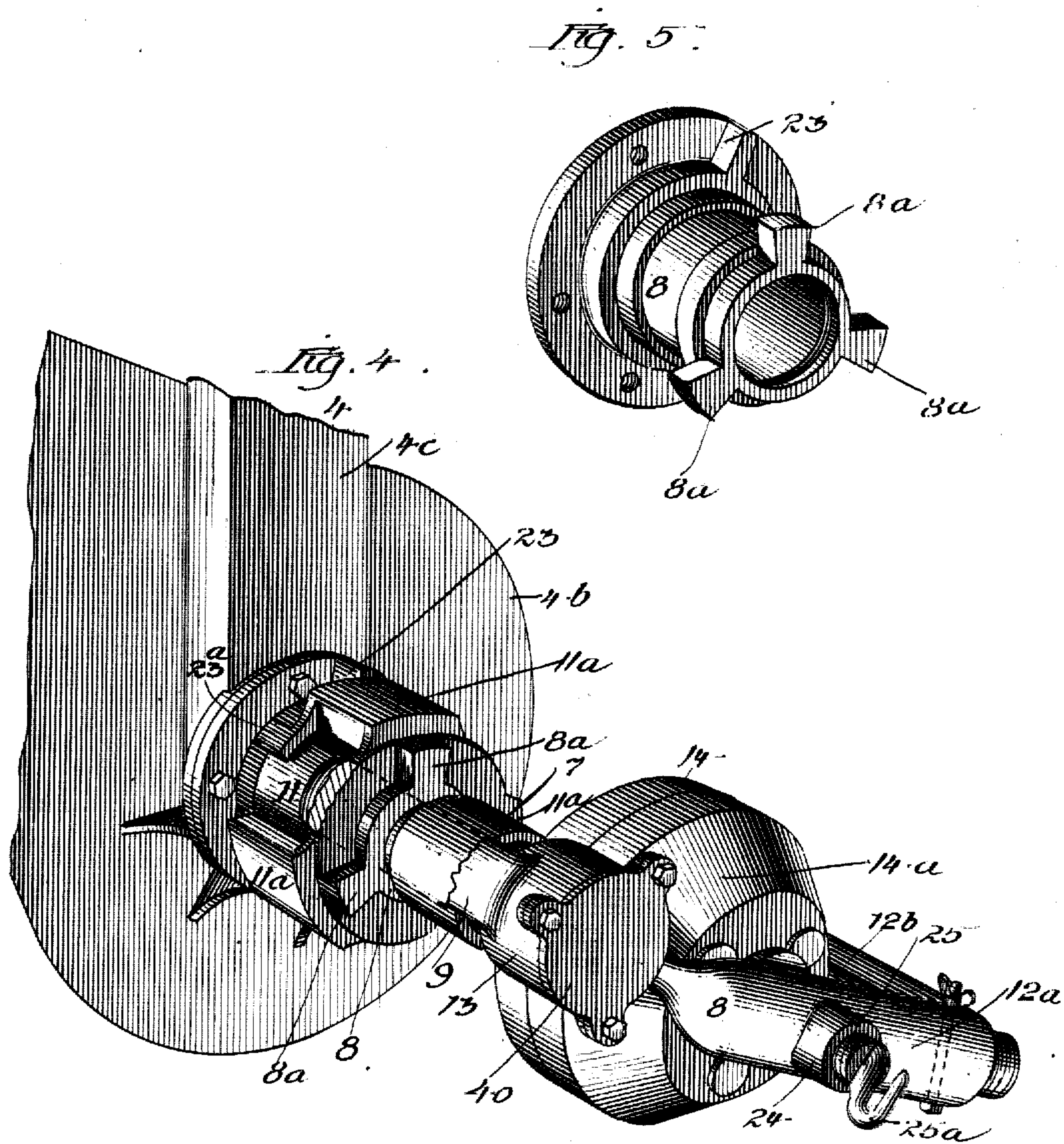
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his Attorneys.

UNITED STATES PATENT OFFICE.

DELBERT E. JOHNSON, OF CHICAGO, ILLINOIS.

MECHANISM FOR TRANSMITTING POWER FROM CAR-AXLES.

No. 814,293.

Specification of Letters Patent.

Patented March 6, 1906.

Application filed July 7, 1905. Serial No. 268,614.

To all whom it may concern:

Be it known that I, DELBERT E. JOHNSON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Mechanism for Transmitting Power from Car-Axles, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

The purpose of this invention is to provide improved means for transmitting power from the axle of the car to any mechanism mounted thereon and particularly to facilitate the mounting and dismounting of the transmitting devices and the repair of the same.

It consists of the features of construction set out in the claims.

In the drawings, Figure 1 is a perspective view of a construction embodying my invention shown in relation to the adjacent portions of the car and power-imparting wheel. Fig. 2 is a sectional side elevation, section being made in a vertical plane transverse to the car-axle through the same and the floor of the car. Fig. 3 is a section at the line 3 3 on Fig. 2. Figs. 4 and 5 are perspective views showing certain of the parts disassembled for the purpose of illustrating mode of assembling.

The portion of the floor of the car adjacent to the devices constituting and pertaining to the invention is seen at 1.

2 is the axle from which power is derived.

3 is the power-transmitting wheel on the axle.

I have shown this invention applied specifically to the operation of a fan mounted on the car for the purpose of forcing air circulation through the car.

4 is the fan-case, which is mounted rigidly with respect to the car-body.

5 is the fan-shaft, which is journaled in the case, the rotary element 6 of the fan being keyed thereon. The fan-shaft is adapted to be inserted endwise into the fan-case and through the rotary element 6 of the fan in order to reach the bearing 4^a at the opposite end from that at which it is entered, the power-transmitting wheel 3 on the car-axle being at the inner side of the fan-case and the mechanism for transmitting power being therefore supported at the inner side of the case. The shaft 5 has at the outer end a pulley 7, through which the rotary move-

ment is derived, and the mechanism intermediate this pulley and the power-transmitting wheel 3, being necessarily constructed so as to accommodate itself to the varying position of the car-axle, is mounted on a hanger 10, which is necessarily pivoted about the axis of the shaft 5, so that its accommodating movement shall not interfere with proper contact of the pulley 7 with the immediate driving-pulley 14. For the purpose of such pivotal mounting there is provided rigid with the fan-case a hollow stud 8, which protrudes from the fan-case at the inner side and upon which the hanger 10 is pivotally hung. For the purpose of so mounting the hanger, and particularly for the purpose of adapting it to be thus mounted and dismounted bodily without interfering with the mounting of the fan-case upon the car and without dissecting the hanger or disassembling in any respect the mechanism thereon and for the purpose at the same time of rendering the hanger secure in its pivotal connection with the fan-case when in operation, the hollow stud 8 has at the outer end three radially-projecting sectoral lugs 8^a 8^a 8^a, and the hanger is furnished at its upper end at the inner side with a pivot-sleeve 11, which has three longitudinal channels 11^a 11^a 11^a, corresponding in circumferential distribution, but not in circumferential position, as hereinafter explained, to the distribution of the radial sectoral lugs 8^a and of dimensions such as to permit the lugs to pass through them as the hanger-sleeve is advanced endwise onto the stud which constitutes its pivot. The sleeve is of such length as to be accommodated on the stud back of the radial lugs 8^a. The position of the lugs 8^a is circumferentially removed about sixty degrees from the position of the channels 11^a of the hanger-sleeve when the hanger is at operative position, so that in order to pass the sleeve over the lugs to reach the journal upon which it is to be seated for pivoting the hanger the latter must be swung around about sixty degrees from its normal position, and when the lugs are passed, the hanger being brought back or allowed to come back by gravity to its normal position, it becomes locked on the pivot-stud by the lugs 8^a standing, respectively, between the ends of the consecutive channels in the sleeve instead of in line with them, respectively, and the hanger

can be disengaged from the stud only by swinging it up again sixty degrees to the position at which it was entered, and this is prevented not only by the fact that the hanger tends by gravity to occupy the normal position, but also by the fact that, as hereinafter explained, it is held in that position with the power-receiving friction-pulley 14 against the power-transmitting wheel 3 of the axle.

The hanger 10 is constructed so as to be as rigid as possible against the tendency to distortion, which may be caused by the side strains to which it is exposed in carrying the power-transmitting mechanism, and for this purpose it comprises two side bars 12 and 12^a, rigidly connected across the lower end by the heavily-ribbed web 12^b. The pivot-sleeve 11 is at the upper end of the side bar 12, and at the upper end of the opposite side bar 12^a there is provided a bearing 13 for the extreme inner end of the shaft 5, so that the pulley 7 intervenes between that bearing and the end of the pivot-stud 8 on which the sleeve 11 is journaled, and in order to permit the application and withdrawal of the hanger with the parts mounted therein in the manner above described—that is to say, without dissecting the structure in any other respect, but merely by swinging the hanger about sixty degrees away from its normal operating position in order to bring the longitudinal channels of the sleeve 11 in line with the radial sectoral lugs 8^a—the diameter of the pulley 7 is enough less than the inner diameter of the sleeve to permit the sleeve to pass out over the pulley. For further stiffening the hanger the outer bearing 13 is connected with the sleeve 11 by a web or arch 9, which extends above the pulley 7 across the gap formed in the hanger for the accommodation of that pulley. The hanger is thus a complete four-sided structure encompassing the wheels journaled therein.

The only other wheel necessary for the purpose of transmitting the power in addition to the pulley 7 is the friction-pulley 14, which is journaled on a shaft 15, lodged in seats 16 16, which are contained in the side bars 12 12^a, said side bars being cylindrical and hollow from the lower end up to a point above the highest position necessary to be occupied by the shaft 15, as seen in Fig. 3, and in the cavity of these hollow side bars, below the seats 16 16, respectively, there are provided springs 17 17, upheld by threaded bolts 18 18, screwed into the lower ends of the side bars for tensioning the springs as may be desired, and for locking these tension-bolts after adjusting the tension as desired in any instance they are each provided with a slot 18^a, and the side bars are transversely perforated to receive cotter-pins 19 19, which take through the slots 18^a, thus permitting the tension-bolts to be adjusted by half-turn steps or degrees to the extent of the length of the slot.

For holding the friction-pulley 14 against the power-transmitting wheel 3 the hanger is connected by chains 20 20 at the opposite sides, extending to a windlass 21, mounted on the car, springs 22 being interposed in the chains between the windlass and their connection to the hanger, so that the pressure of the pulley 14 against the wheel 3, produced by winding the chain upon the windlass to any extent, shall be elastic, as is not only desirable for the purpose of properly transmitting power, but is also necessary in order to permit the hanger to accommodate itself to the changing position of the wheel 3, which will occur in the longitudinal movement of the car-body relative to the truck in travel of the car.

The face of the power-transmitting wheel 3 is curved about the vertical axis of the car-truck for a purpose which is familiar in this art; but as it may be impracticable to make said wheel 3 broad enough to accommodate the maximum change of angular position of the truck with respect to the car which will occur in rounding the shortest curves around which the car can be moved and in passing such short curves the pulley 14 will sometimes be carried off the face of the wheel 3. In such case in the absence of preventative means the action of the springs 22 would cause the hanger to swing toward the axle 2, so as to bring the pulley 14 alongside the power-transmitting wheel 3, and when the car passed onto a straight track the truck coming back to direct transverse position would cause the wheel 3 to tear off the hanger or break the pulley 14 and destroy the power-transmitting structure. To prevent this result, the pulley 14 is made about three times as wide as necessary for the purpose of operating on the pulley 7 and is beveled or tapered off conically at both sides at an angle of about forty-five degrees, the conical slopes 14^a-14^a (see Fig. 3) being thereby of sufficient extent in the direction of the axis of the pulley to cover the maximum range of movement of the edge or side plane of the wheel 3 in its most extreme change of position due to the shortest curve around which the car can pass, so that even in such extreme cases the bevel or conical slope of the pulley 14 would engage the edge of the wheel 3 as the car passed off from the curve and while the truck was turning back to normal position, and with the assistance afforded by the rotation of the wheel 3 in contact with this conical slope of the pulley 14 the hanger will be crowded back, so that said pulley will come again into proper bearing of its middle portion of full diameter upon the face of the wheel 3. In order to prevent the hanger from swinging any further than necessary in order to maintain the bearing of the pulley 14 upon the wheel 3 throughout all ordinary curvatures of track and so as to reduce as far

as possible the service required, as above described, of the conical slope 14^a, a stop 23 is provided projecting from the fan-case, with which a stop-finger 11^b, projecting from the sleeve 11, collides when it has swung in toward the axle 2 as far as it is deemed necessary to permit it to swing for the purpose indicated.

Certain details of construction may be noted as follows: For connecting the chains 20 20 to the hanger the latter is provided at opposite sides with hollow bosses 24 24 for allowing the shaft 15 to be put in position, and into them are screwed plugs 25 25, having the hooks 25^a for engagement of the chains.

Preferably the shaft 5 is provided with roller-bearings at opposite ends, as seen at 26 at the outer side of the fan-case and at 27 in the inner bearing 13 on the hanger. The sleeve 11 is designed to be made long enough to insure the alinement of the inner bearing 13 with the outer bearing 4^a, and the hollow stud 8 is preferably not made a bearing, but is fitted with a dust-cap 28. The pulley 14 is also provided with roller-bearings on the shaft 15, and for convenience of constructing it with such bearings it is preferably made in two members, as seen in Fig. 3, each of the two members having a roller-bearing 29 and these roller-bearings being suitably guarded and spaced apart by an intermediate collar 30, which serves as a cap for the inner ends of both the roller-bearing boxes and as a pocket for vaseline to prevent rusting of the rolls.

In order that not only the repairs to the power-transmitting devices, but also to the fan, may be effected without dissecting the structure to an inconvenient extent or detaching it from the car, I provide for the removal of the rotary element of the fan out through the periphery of the fan by making said fan-case so as to be peripherally closed at the outer side by a sheet-metal cap 31, the removal of which gives access to the fan-hub, so that the key-pins 32 32 can be withdrawn and the shaft thereby left free for withdrawal endwise when the hanger has been detached in the manner above described, and the rotary element 6 of the fan may then be taken out through the aperture uncovered by the removal of the cover 31.

It will be noticed that the fan-case, with the exception of this removable cover, is integral, being cast with the fan-chamber 4^b and the lateral air-inducts 4^c 4^c, leading to its center and merging in the single induct connection 4^d, while the fan-chamber 4^b is produced taperingly in a form symmetrical about a plane radial to the axis of the shaft to the discharge connection at 4^e, and this integral fan-case is secured to the car-body by the attachment of the induct and discharge connections mentioned to the induct and discharge pipes 33 and 34, which may be understood to be mounted in a prominent manner on

the car, and also by means of the lugs 35 35 in position for bolting to the longitudinal sills 36 36 of the car-body.

Vaseline-pockets 40^a are formed in the caps 40 40, which close the ends of the housings of the rolls 26 and 27 of the bearings of the shaft 5.

I claim—

1. In a device for the purpose indicated, in combination with a car-body and a car-axle having a power-wheel, a shaft-bearing element mounted on the car; a shaft therein protruding therefrom; a hanger pivoted on the shaft-bearing element about the shaft; power-transmitting means on the hanger for driving said shaft, the pivotal connection of the hanger to the shaft-bearing element being made by a sleeve on one of said parts and a hollow stud on the other part, the stud having at one end a radial projection, and the sleeve having an interior longitudinal channel adapted to be traversed by the projection in bringing the parts into pivotal connection, such channel and projection being out of line at the operative position of the hanger.

2. In a device for the purpose indicated, a bearing for a part to be rotated mounted rigidly with respect to the car-body; a shaft journaled in such rigidly-mounted element; a hanger pivotally mounted on said element about the axis of said shaft, and power-transmitting means on the hanger, such pivotal connection being made by means of a pivot-stud on the rigidly-mounted element and a pivot-sleeve on the hanger, the sleeve having a longitudinal groove or channel, and the stud having a radially-projecting lug at the outer end adapted to pass through the channel of the sleeve, said channel and lug being circumferentially out of line at the normal position of the hanger.

3. In a device for the purpose indicated, in combination with a car-body axle and a power-transmitting wheel on the axle, a shaft-bearing element mounted on the car-body; a shaft therein protruding therefrom, and a power-transmitting wheel on its protruding portion; a hanger pivoted on the shaft-bearing element about the shaft; power-transmitting means on the hanger for cooperation with the power-wheel on the axle for driving said wheel on the shaft, the pivotal connection of the hanger to the shaft-bearing element being made by a sleeve on the hanger and a hollow stud on the shaft-bearing element, the interior diameter of the sleeve being such as to permit the wheel on the shaft to pass through it, and means for retaining the sleeve.

4. In a device for the purpose indicated, in combination with a car-body and a car-axle, a power-communicating wheel on the axle; a shaft-bearing element mounted on the car; a shaft therein protruding therefrom; a power-

communicating wheel on the protruding portion of such shaft; a hanger pivoted on the shaft-bearing element about the shaft; power-transmitting means on the hanger cooperating with the power-wheel on the axle for driving the wheel on the shaft, the pivotal connection of the hanger to the shaft-bearing element being made by a sleeve on the hanger and a hollow pivot-stud on the shaft-bearing element through which the shaft protrudes, the stud having at the end a radial projection, and the sleeve having an interior longitudinal channel adapted to be traversed by the projection when the sleeve and stud are brought into pivotal relation, such channel and projection being out of line at the operative position of the hanger, and the diameter of the sleeve, exclusive of its longitudinal channel, being such as to permit the wheel on the shaft to pass through it.

5. In a device for the purpose indicated, in combination with a car-body and car-axle, a fan-case mounted on the car-body; a fan-shaft journaled in the case and protruding therefrom at the inner side, the fan-case having a pivot-stud projecting at that side concentric about the protruding shaft; a power-communicating wheel on the car-axle; a hanger having a sleeve by which it is pivotally suspended from the stud; a pulley journaled in the hanger, adapted to be frictionally engaged by the power-wheel on the axle; a wheel on the shaft at the end of the stud, which derives power from the pulley on the hanger, the hanger having a bearing for the shaft at the opposite side of the shaft-wheel from the stud, and an arch connecting said bearing with the hanger pivot-sleeve.

6. In a device for the purpose indicated, in combination with the fan-case mounted rigidly on the car-body and having a laterally-projecting pivot-stud, a hanger pivotally suspended on the stud; a wheel on the shaft and a wheel in the hanger which are operatively engaged when the hanger is thus suspended,

the shaft-wheel being of less diameter than the stud at the pivot-bearing of the hanger thereon, whereby said hanger pivot-bearing is adapted to pass over the wheel on the shaft for reaching its journal on the stud, said pivot-bearing being longitudinally grooved, and the stud having a projection adapted to pass through the groove, said groove and projection being out of line at normal position of the hanger.

7. In a device for the purpose indicated, in combination with the fan-case rigidly mounted on the car-body and having a shaft journaled in it, a rotating element within the fan-case detachably keyed to the shaft; power-transmitting means and a hanger in which they are journaled pivotally mounted on the outside of the case about the axis of the shaft and removable bodily therefrom, the shaft being adapted for endwise withdrawal in the same direction, the fan-case having a peripheral aperture through which the rotatable element may be withdrawn when detached from the shaft, and a removable cover for such aperture.

8. In a device for the purpose stated, a fan-case having integrally a chamber for the rotating element; induct-passages leading from the center outside such chamber and merging in a single passage beyond the circumference of such chamber, said chamber being extended tapering and symmetrical about a plane radial to the axis of the rotating element, and terminating in a pipe connection, and having a peripheral aperture for the admission and removal of the rotating element, and a detachable cover for such aperture.

In testimony whereof I have hereunto set my hand, in the presence of two witnesses, at Chicago, Illinois, this 1st day of March, 1905.

DELBERT E. JOHNSON

In presence of—

M. GERTRUDE ALLEN

FREDK. G. FISCHER