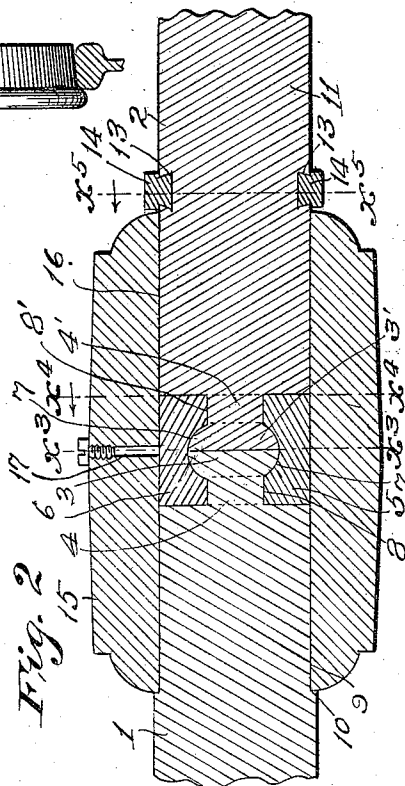
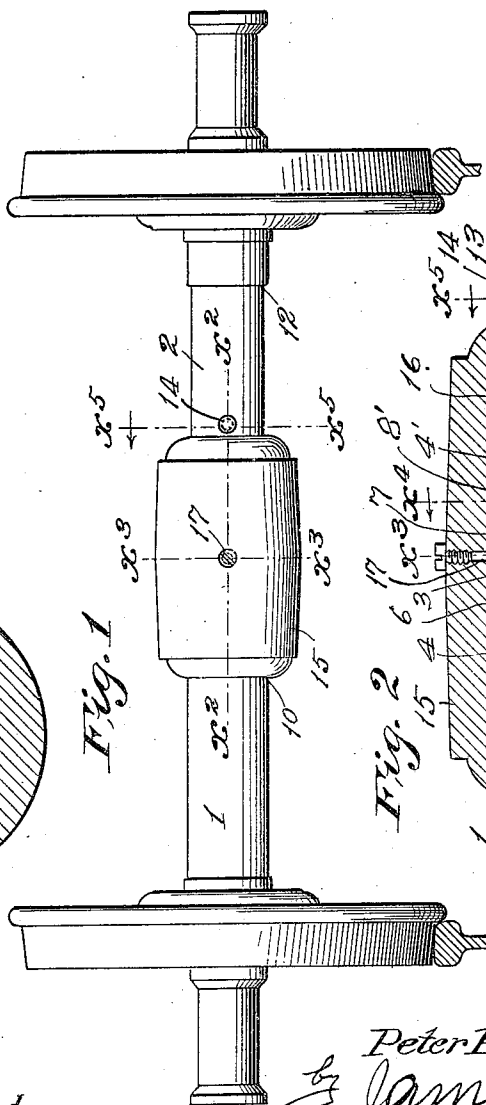
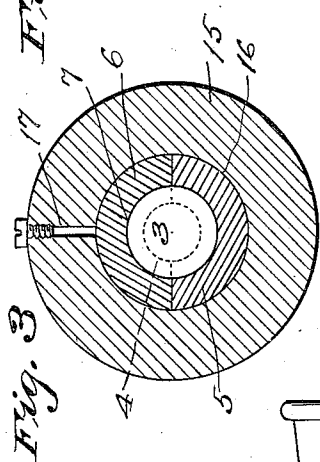
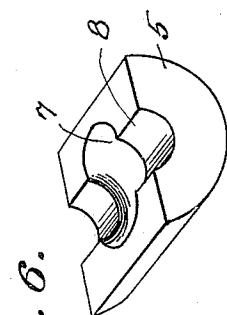
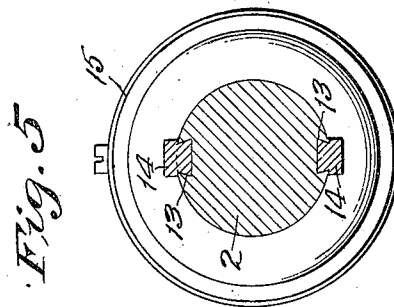
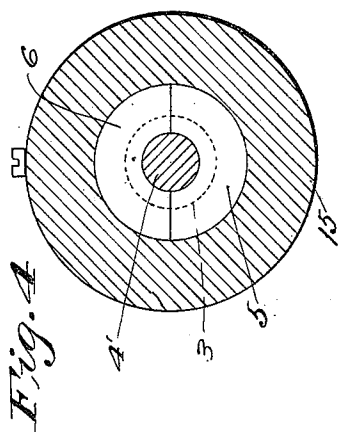


P. P. COOKINGHAM.
DIFFERENTIAL CAR AXLE.
APPLICATION FILED MAY 4, 1909.

945,915.

Patented Jan. 11, 1910.



Witnesses
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UNITED STATES PATENT OFFICE.

PETER PARK COOKINGHAM, OF LONGBEACH, CALIFORNIA, ASSIGNOR OF ONE-THIRD
TO JOSEPH H. FREDERICK, OF LONGBEACH, CALIFORNIA.

DIFFERENTIAL CAR-AXLE.

945,915.

Specification of Letters Patent.

Patented Jan. 11, 1910.

Application filed May 4, 1909. Serial No. 493,958.

To all whom it may concern:

Be it known that I, PETER PARK COOKINGHAM, a citizen of the United States, residing at Longbeach, in the county of Los Angeles and State of California, have invented a new and useful Differential Car-Axle, of which the following is a specification.

The object of this invention is to produce a differential car axle having features of superiority with regard to simplicity, strength, cheapness, convenience of assembling, and freedom from liability of becoming disassembled.

The accompanying drawings illustrate the invention.

Figure 1 is an elevation of a differential car axle standing on a track, fragments of which are shown. Fig. 2 is a fragmental sectional elevation of the joint on line x^2 , Fig. 1. Fig. 3 is a section on line x^3 , Figs. 1 and 2. Fig. 4 is a section on line x^4 , Fig. 2. Fig. 5 is a section on line x^5 , Figs. 1 and 2. Fig. 6 is a perspective view of one of the segmental collars detached.

The axle-tree is made in two sections 1, 2 reduced at their inner ends and there provided with heads 3, 3', respectively connected to the axle-sections by necks 4, 4'. Semicylindrical collars or blocks 5, 6 are provided with chambers 7 to unitedly fit and bind the heads 3, 3', and are provided on each side of the chambers with orifices 8, 8' to admit and embrace the necks 4, 4'.

One of the axle-sections 1, is provided with a reduced portion 9 terminating against a shoulder 10, and the other axle-section, 2, is provided with a longer reduced portion 11 terminating against a shoulder 12; the reduced portions and the assembled blocks being of equal diameter and constituting a cylindrical middle portion of the axle-tree. The longer reduced portion is provided with seats 13 to receive stops 14 which may be compressed into said seats, said seats being preferably undercut for that purpose.

A sleeve 15 is provided with a central bore 16 that exactly fits on the reduced portions 9 and 11. The longer reduced portion is of sufficient length to accommodate the sleeve for the purpose of assembling the blocks. When the sleeve is slid onto the inner portion and brought against the shoulder 12 the end of the sleeve farthest from said shoulder will be flush with the end of the

inner reduced portion, thus allowing the blocks to be assembled on the abutting heads and their necks when the sections are alined. When the blocks are thus assembled the sleeve may be slid over the joint thus formed and against the shoulder 10, thus bringing the end of the sleeve farthest from said shoulder 10 at the edge of the seats 13, whereupon the stops 14 may be inserted and swaged into place, being heated for that purpose.

The abutting ends of the heads are preferably flat faces extending at right angles to the axes of the axle-sections, and the blocks are rectangular in cross-section except the channels which form the chamber to contain the heads. Said channel is preferably an angular groove semicircular in cross-section, and the heads are rounded toward the necks, thus to increase their resisting power.

The purpose of the sleeve is to hold the blocks in place, and the stops hold the sleeve in place. All of this is accomplished without the necessity of casting any part onto the axle or forcing the parts together by hydraulic pressure; although it is understood that in some cases the sleeve may be forced into place upon the shorter reduced portion by hydraulic pressure; the reduced portion 9 in such cases being of sufficient diameter to require such hydraulic pressure in order to fit the parts together, while the reduced portion 16 is simply a machine fit so as to revolve freely. In case the sleeve is thus seated by hydraulic pressure the stops may be dispensed with.

I claim:—

1. A differential car axle comprising two axle-sections reduced at their inner ends and there provided with heads connected by necks to the bodies of the axle-sections; segmental blocks provided with chambers to unitedly fit the heads and provided at the sides of the united chambers with orifices to admit and unitedly embrace the necks; one of the axle-sections being provided with a reduced portion terminating against a shoulder, and the other axle-section being provided with a longer reduced portion terminating against a shoulder, the reduced portions and the assembled blocks being of equal diameter and constituting a cylindrical middle portion of the axle; a sleeve provided with a central bore fitted on and surrounding the shorter reduced portion, the assembled blocks and

a part of the longer reduced portion; said longer reduced portion being of sufficient length to accommodate the sleeve for the purpose of assembling the blocks; said sleeve being fastened against removal from the shorter reduced portion.

2. A differential car axle comprising two axle-sections reduced at their inner ends and there provided with heads connected by necks to the bodies of the axle-sections; segmental blocks provided with chambers to unitedly fit the heads and provided at the sides of the united chambers with orifices to admit and unitedly embrace the necks; one of the axle-sections being provided with a reduced portion terminating against a shoulder, and the other axle-section being provided with a longer reduced portion terminating against a shoulder; the reduced portions and the assembled blocks being of equal diameter and constituting a cylindrical middle portion of the axle; a sleeve provided with a central bore fitted on and surrounding the shorter reduced portion, the assembled blocks and a part of the longer reduced portion being of sufficient length to accommodate the sleeve for the purpose of assembling the blocks; seats being provided in said longer reduced portion, and stops in said seats to hold the sleeve against the shoulder at the end of the shorter reduced portion.

3. A differential car axle comprising two axle-sections reduced at their inner ends and there provided with heads connected by necks to the bodies of the axle-sections; segmental blocks provided with chambers to unitedly fit the heads and provided at the sides of the united chambers with orifices to admit and unitedly embrace the necks; one of the axle-sections being provided with a reduced portion terminating against a shoulder, and the other axle-section being provided with a longer reduced portion terminating against a shoulder; the reduced portions and the assembled blocks being of equal diameter and constituting a cylindrical middle portion of the axle; a sleeve provided with a central bore fitted on and surrounding the shorter reduced portion, the assembled blocks and a part of the longer reduced portion being of sufficient length to accommodate the sleeve for the purpose of assembling the blocks; undercut seats being provided in said longer reduced portion, and stops swaged in said seats to hold the sleeve against the shoulder at the end of the shorter reduced portion.

4. A differential car axle comprising two axle-sections reduced at their inner ends and there provided with heads connected by necks to the bodies of the axle-sections; said heads abutting against each other and being flat at their abutting surfaces; segmental blocks provided with chambers to unitedly fit the

heads and provided at the sides of the united chambers with orifices to admit and unitedly embrace the necks; one of the axle-sections being provided with a reduced portion terminating against a shoulder, and the other axle-section being provided with a longer reduced portion terminating against a shoulder; the reduced portions and the assembled blocks being of equal diameter and constituting a cylindrical middle portion of the axle; a sleeve provided with a central bore fitted on and surrounding the shorter reduced portion, the assembled blocks and a part of the longer reduced portion being of sufficient length to accommodate the sleeve for the purpose of assembling the blocks; seats being provided in said longer reduced portion, and stops in said seats to hold the sleeve against the shoulder at the end of the shorter reduced portion.

5. A differential car axle comprising two axle-sections reduced at their inner ends and there provided with heads connected by necks to the bodies of the axle-sections and rounded at their necks; segmental blocks provided with chambers to unitedly fit the heads and provided at the sides of the united chambers with orifices to admit and unitedly embrace the necks; one of the axle-sections being provided with a reduced portion terminating against a shoulder, and the other axle-section being provided with a longer reduced portion terminating against a shoulder; the reduced portions and the assembled blocks being of equal diameter and constituting a cylindrical middle portion of the axle; a sleeve provided with a central bore fitted on and surrounding the shorter reduced portion, the assembled blocks and a part of the longer reduced portion being of sufficient length to accommodate the sleeve for the purpose of assembling the blocks; seats being provided in said longer reduced portion, and stops in said seats to hold the sleeve against the shoulder at the end of the shorter reduced portion.

6. A differential car axle comprising two axle-sections reduced at their inner ends and there provided with heads connected by necks to the bodies of the axle-sections; said heads abutting against each other and being flat at their abutting surfaces and rounded at their necks; segmental blocks provided with chambers to unitedly fit the heads and provided at the sides of the united chambers with orifices to admit and unitedly embrace the necks; one of the axle-sections being provided with a reduced portion terminating against a shoulder, and the other axle-section being provided with a longer reduced portion terminating against a shoulder; the reduced portions and the assembled blocks being of equal diameter and constituting a

cylindrical middle portion of the axle; a sleeve provided with a central bore fitted on and surrounding the shorter reduced portion, the assembled blocks and a part of the
5 longer reduced portion; said longer reduced portion being of sufficient length to accommodate the sleeve for the purpose of assembling the blocks; seats being provided in said longer reduced portion, and stops in
10 said seats to hold the sleeve against the

shoulder at the end of the shorter reduced portion.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 19th day of April, 1909.

PETER PARK COOKINGHAM.

In presence of—

JAMES R. TOWNSEND,
LOUISE CAMPBELL.