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PATENTED NOV. 28, 1905.

T. J. LINDSAY.  
DRIVING AXLE STRUCTURE FOR AUTOMOBILES.  
APPLICATION FILED MAR. 13, 1905.

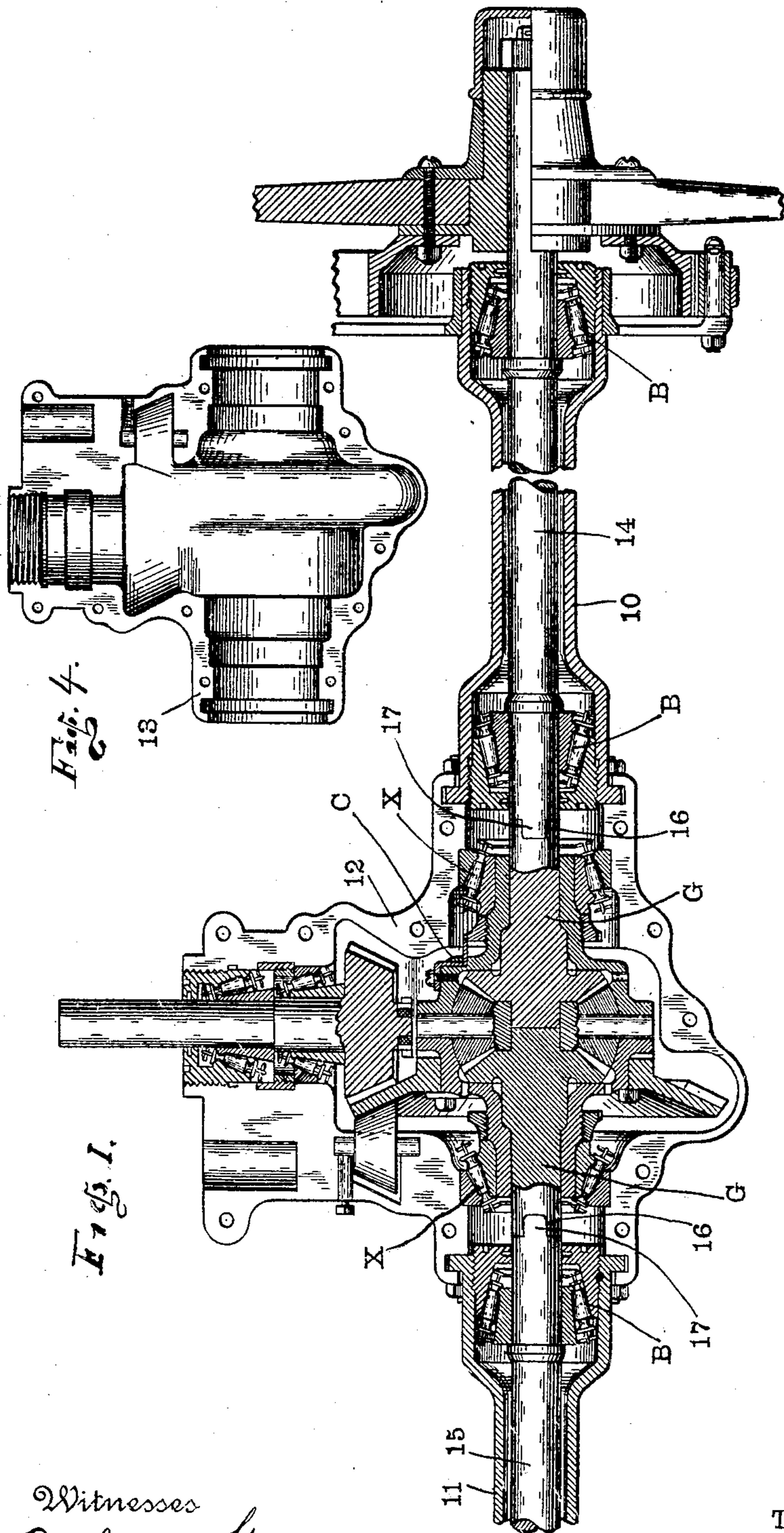


Fig. 1.

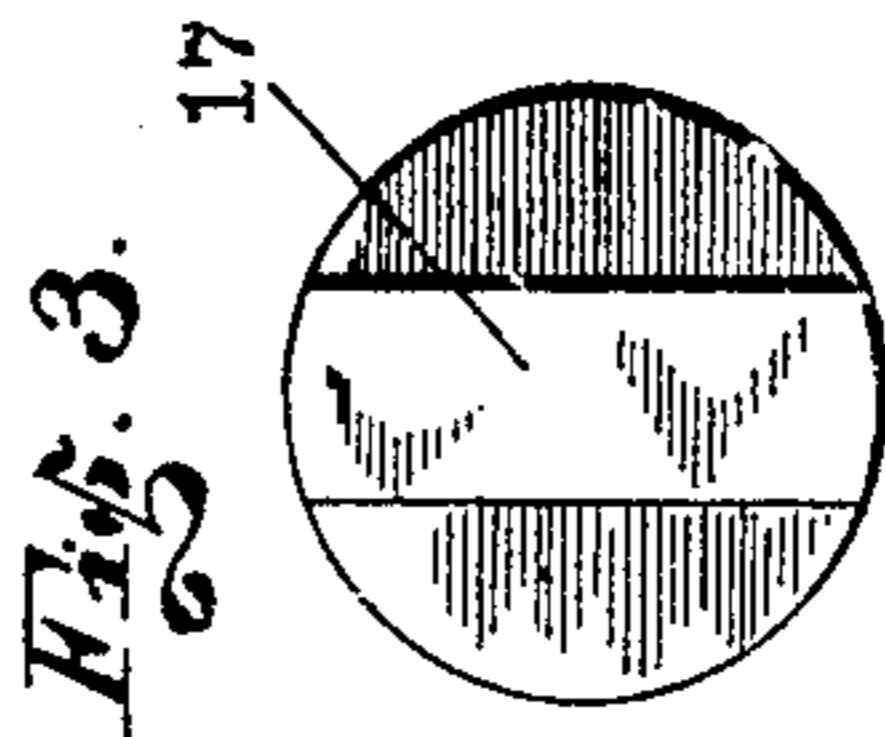
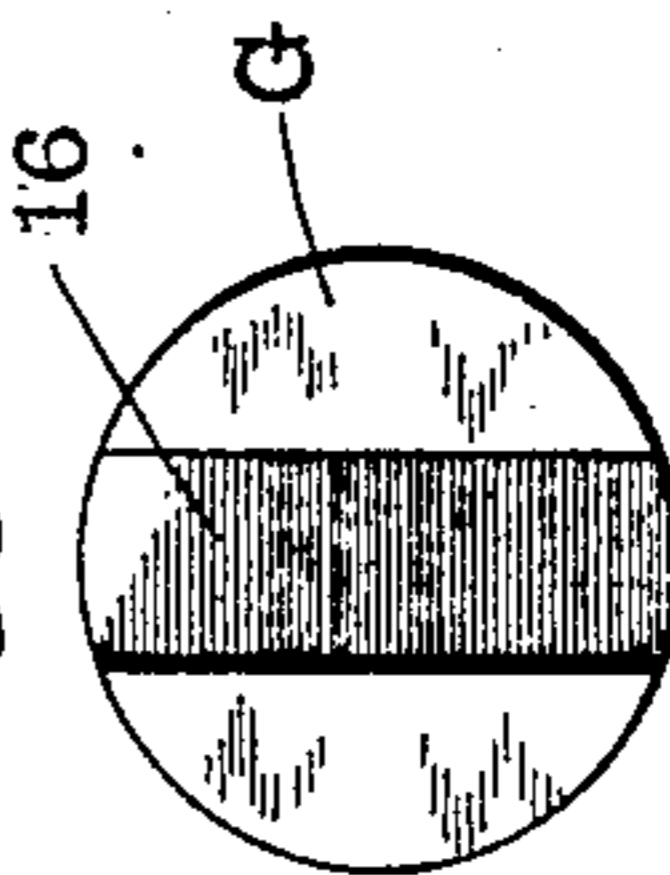


Fig. 2.



Witnesses  
Cecilia Kearns.  
J. A. Walsh.

Inventor  
Thomas J. Lindsay

By  
Bradford Hood,  
Attorneys

# UNITED STATES PATENT OFFICE.

THOMAS J. LINDSAY, OF INDIANAPOLIS, INDIANA, ASSIGNOR OF ONE-HALF TO WILLARD HARMON, OF INDIANAPOLIS, INDIANA.

## DRIVING-AXLE STRUCTURE FOR AUTOMOBILES.

No. 805,567.

Specification of Letters Patent.

Patented Nov. 28, 1905.

Application filed March 13, 1905. Serial No. 249,926.

*To all whom it may concern:*

Be it known that I, THOMAS J. LINDSAY, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Driving-Axle Structures for Automobiles, of which the following is a specification.

My invention relates to an improvement in automobile rear-axle structure, especially of that type shown in my Patent No. 748,760 of January 5, 1904.

The object of my present invention is to produce a structure from which the compensating gear may be transversely withdrawn without disturbing the shaft-sections.

The accompanying drawings illustrate my invention as embodied in a bevel-gear drive, Figure 1 being a horizontal section of the structure with the transversely-removable cap omitted; Figs. 2 and 3, end elevations of the cooperating ends of a shaft-section and adjacent portion of the compensating gearing; and Fig. 4 a plan, on a reduced scale, of the cap. (Omitted in Fig. 1.)

In the drawings, 10 and 11 indicate a pair of hollow-axle sections which are connected at their inner ends by means of a gear-inclosing casing consisting of a portion 12, to which the axle-sections are rigidly connected, and a removable cap 13, which complements the structure 12 and which may be readily removed therefrom. Mounted in the axle-sections 10 and 11 are shaft-sections 14 and 15, respectively, which in the present case are shown as journaled in the axle-sections by suitable bearings B. Journaled in suitable bearings X is the compensating-gear structure C, which may be of any desired type, the main gears G of which, however, preferably permanently project beyond the bearings X. The adjacent ends of the gears G and the shaft-sections 14 and 15 are provided with coacting parts, which permit transverse withdrawal. In the present case said connections consist of a diametrical slot 16, formed across the end of the shank of the gear G, and a corresponding diametrical rib 17, formed at the end of the shaft-section 14 or 15.

The bearings X are preferably bodily transversely removable from the casing 12.

In operation the shaft-sections 14 and 15 may remain in position, and when the cap 13 is removed and the shaft-sections turned

until the portions 17 of the two shaft-sections lie at substantially right angles to the casing 12 the compensating-gear structure C may be bodily transversely withdrawn from the structure without disturbing the shaft-sections in the axle structure.

I claim as my invention—

1. In a driving-axle structure for automobiles, the combination of a hollow-axle structure, a pair of shaft-sections mounted therein and having their adjacent ends separated, a compensating-gear structure journaled in the axle structure between the adjacent ends of the shaft-sections, and driving connections between the said shaft-sections and compensating gear permitting transverse withdrawal of the compensating gear without axial movement of the shaft-sections.

2. In a driving-axle structure for automobiles, the combination of a hollow-axle structure, a pair of shaft-sections rotatably mounted therein with their adjacent ends separated, a rotatable driving element mounted in said structure between the adjacent ends of the shaft-sections, and driving connections between said rotatable driving element and the adjacent ends of the shaft-sections permitting transverse withdrawal of the driving element without axial movement of the shaft-sections.

3. In a driving-axle structure for automobiles, the combination of, a hollow-axle structure consisting of a pair of hollow casings, and an intermediate larger casing connecting the adjacent ends thereof and consisting of a main portion and a removable cap, a pair of shaft-sections mounted in said axle structure and having their adjacent ends separated but projecting into the intermediate casing, a compensating-gear structure arranged in said larger casing between the adjacent ends of the shaft-sections; and driving connections between said compensating-gear structure and the adjacent ends of the shaft-sections permitting transverse withdrawal of the compensating-gear structure without axial movement of the shaft-sections.

4. In a driving-axle structure for automobiles, the combination of, a hollow-axle structure consisting of a pair of hollow-axle casings and an intermediate larger casing connecting the adjacent ends thereof and consisting of a main portion and a removable cap, a pair of shaft-sections mounted in said axle

structure and having their adjacent ends separated but projecting into the intermediate casing, a compensating-gear structure independently journaled in the main portion of said larger casing, and driving connections between said compensating-gear structure and the adjacent ends of the shaft-sections permitting transverse withdrawal of the compensating-gear structure without axial movement of the shaft-sections.

5. In a driving-axle structure for automobiles, the combination of, a hollow-axle structure, a pair of shaft-sections mounted therein and having their adjacent ends separated, a compensating-gear structure journaled in the axle structure between the adjacent ends of the shaft-sections, and a driving connection between the inner end of each shaft-section and the adjacent portion of the compensating gear consisting of a diametrical rib and corresponding slot permitting transverse withdrawal of the compensating gear without axial movement of the shaft-sections.

6. In a driving-axle structure for automobiles, the combination of, a hollow-axle structure, a pair of shaft-sections rotatably mounted therein with their adjacent ends separated, a rotatable driving element mounted in said structure between the adjacent ends of the shaft-sections, and a driving connection between each end of the rotatable driving element, and the adjacent shaft-section end consisting of a diametrical rib and slot permitting transverse withdrawal of the driving element without axial movement of the shaft-sections.

7. In a driving-axle structure for automobiles, the combination of, a hollow-axle structure consisting of a pair of hollow casings, an intermediate larger casing connecting the ad-

5 adjacent ends thereof and consisting of a main portion and a removable cap, a pair of shaft-sections mounted in said axle structure and having their adjacent ends separated but projecting into the intermediate casing, a compensating-gear structure arranged in said larger casing between the adjacent ends of the shaft-sections, and a driving connection between each end of said compensating-gear structure and the adjacent shaft-section end consisting of a diametrical rib and slot permitting transverse withdrawal of the compensating-gear structure without axial movement of the shaft-sections.

8. In a driving-axle structure for automobiles, the combination of, a hollow-axle structure consisting of a pair of hollow-axle casings and an intermediate larger casing connecting the adjacent ends thereof and consisting of a main portion and a removable cap, a pair of shaft-sections mounted in said axle structure and having their adjacent ends separated but projecting into the intermediate casing, a compensating-gear structure independently journaled in the main portion of the larger casing, and a driving connection between each end of said compensating-gear structure and the adjacent shaft-section end consisting of a diametrical rib and slot permitting transverse withdrawal of the compensating-gear structure without axial movement of the shaft-sections.

In witness whereof I have hereunto set my hand and seal, at Indianapolis, Indiana, this 3d day of March, A. D. 1905.

THOMAS J. LINDSAY. [L. s.]

Witnesses:

ARTHUR M. HOOD,  
JAMES A. WALSH