

No. 609,925.

Patented Aug. 30, 1898.

F. M. ARNOLD.
AXLE.

(Application filed Mar. 11, 1898.)

(No Model.)

Fig. 1.

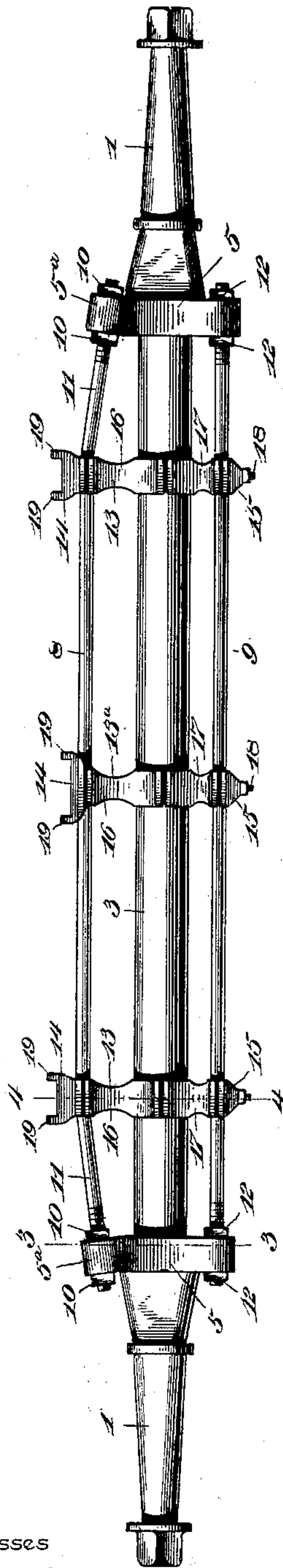


Fig. 2.

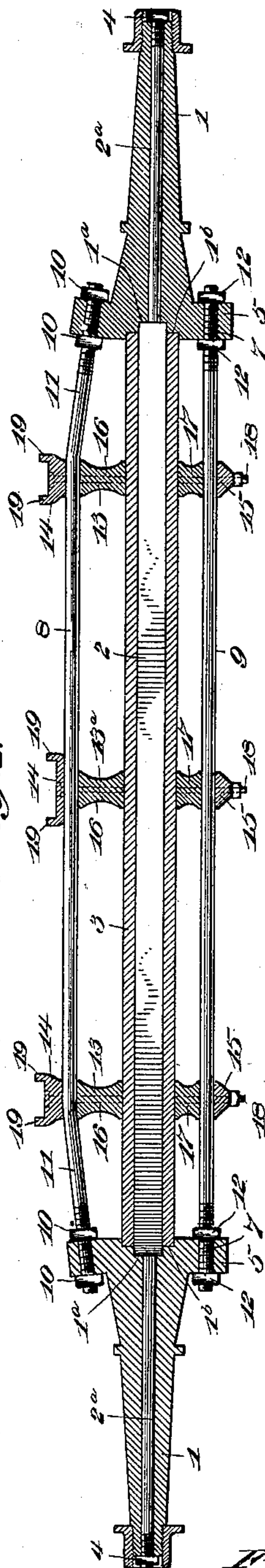


Fig. 3.

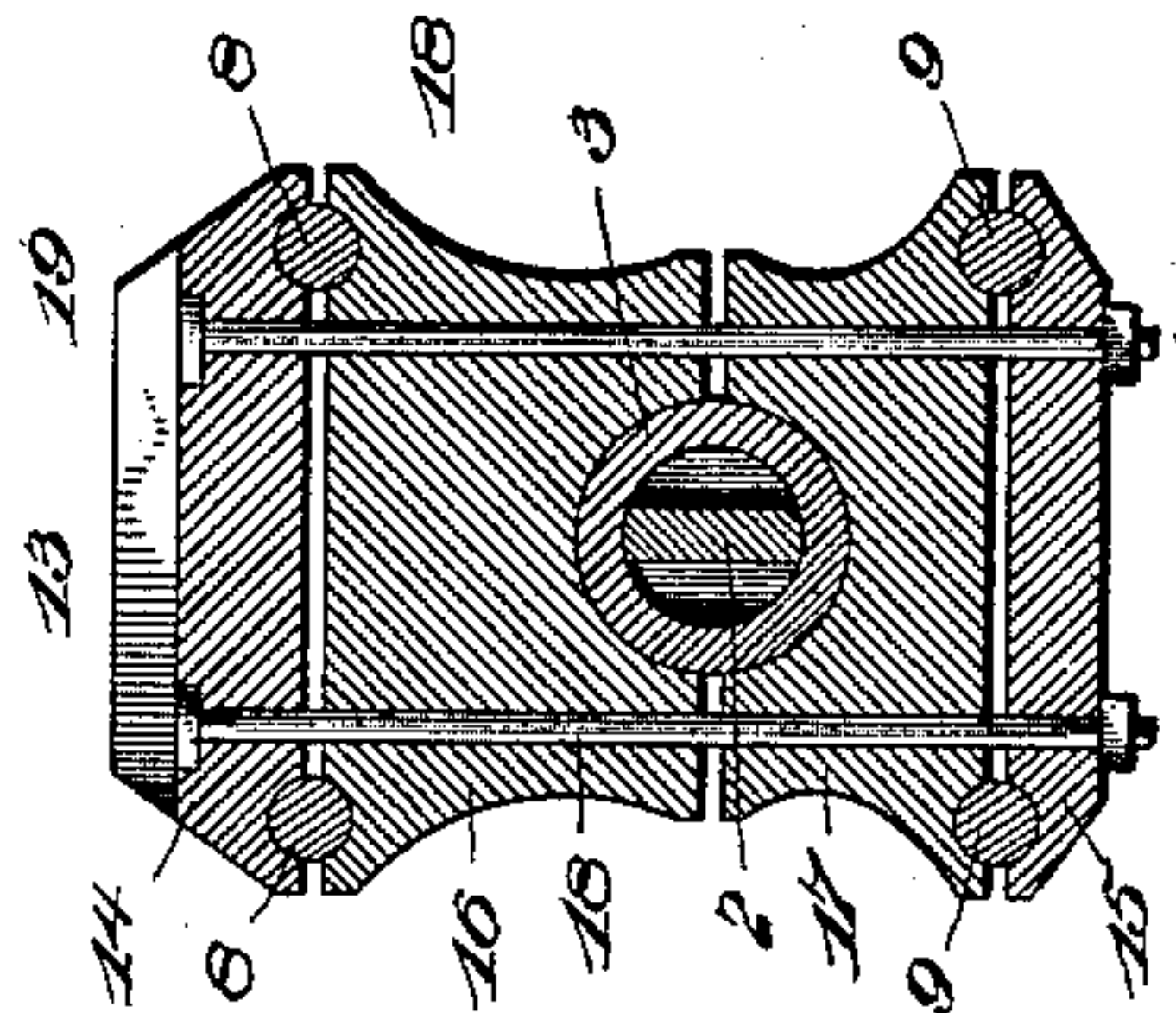


Fig. 4.

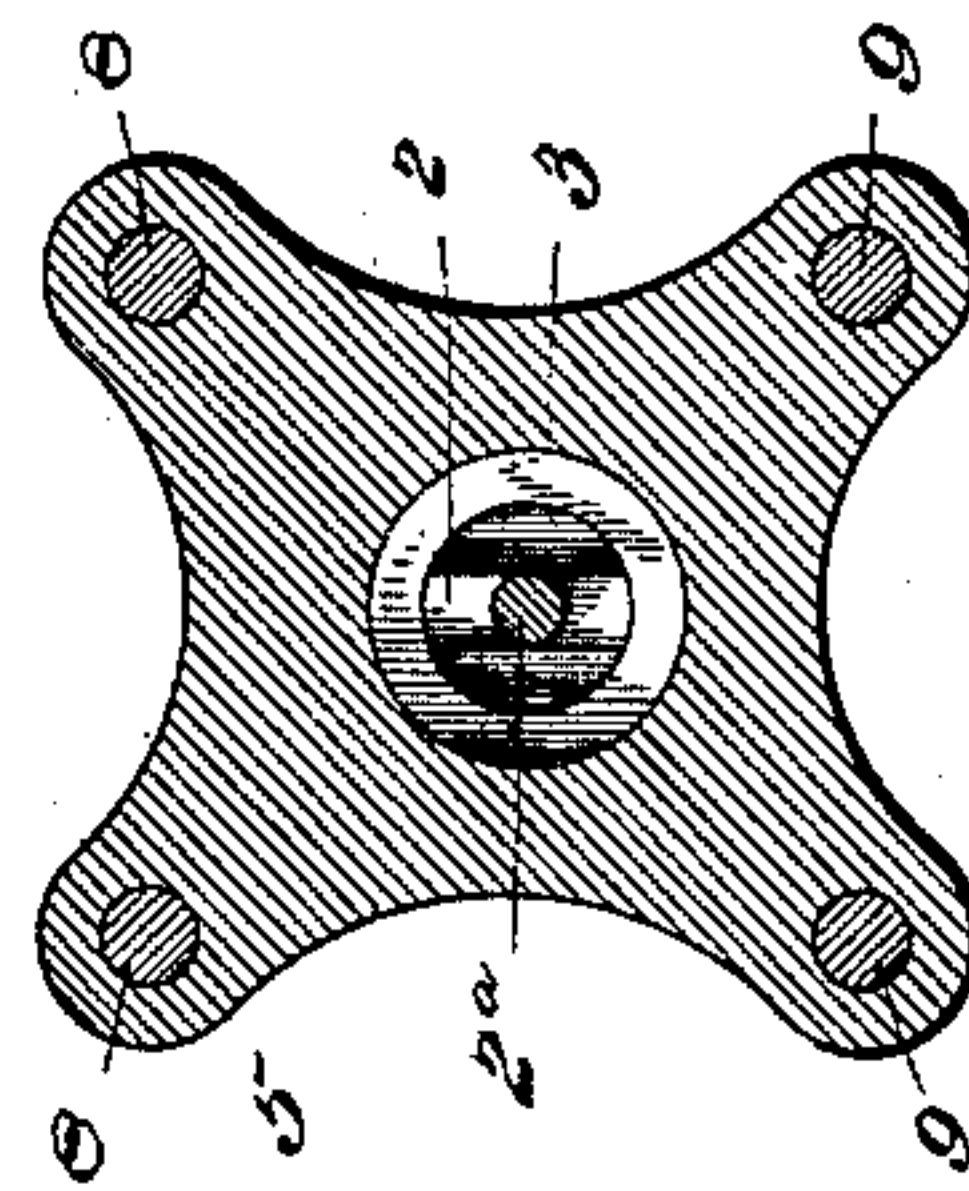
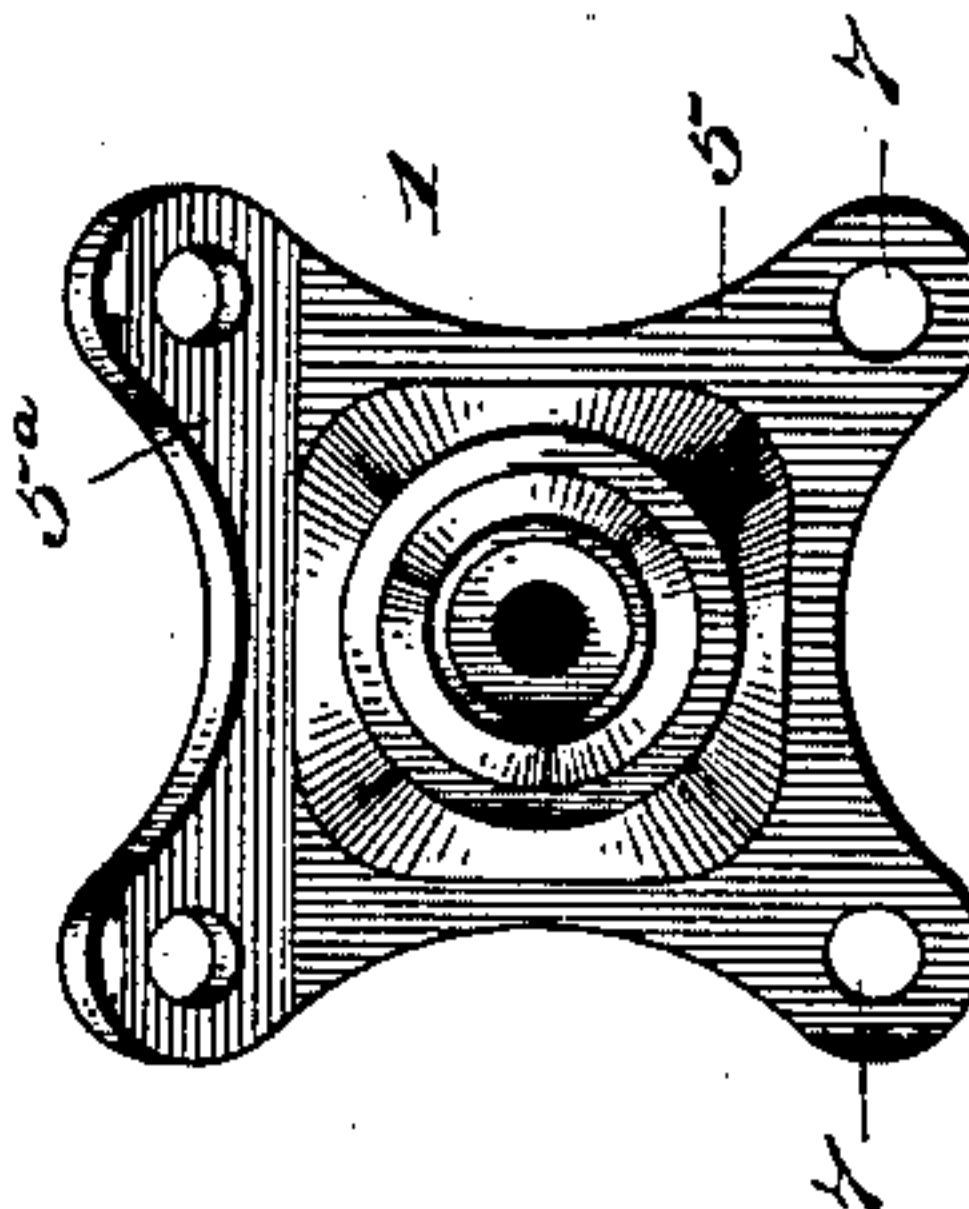


Fig. 5.



Witnesses

J. F. Doyle.

J. F. Doyle.

Frank M. Arnold, Inventor
By his Attorneys.

C. A. Snow & Co.

UNITED STATES PATENT OFFICE.

FRANK MARION ARNOLD, OF GRAND RAPIDS, OHIO.

AXLE.

SPECIFICATION forming part of Letters Patent No. 609,925, dated August 30, 1898.

Application filed March 11, 1898. Serial No. 673,528. (No model.)

To all whom it may concern:

Be it known that I, FRANK MARION ARNOLD, a citizen of the United States, residing at Grand Rapids, in the county of Wood and State of Ohio, have invented a new and useful Axle, of which the following is a specification.

The invention relates to improvements in axles.

The object of the present invention is to improve the construction of axles and to provide a simple and comparatively inexpensive one which will possess great strength and durability in order to adapt it for use on heavy vehicles and which will be capable of ready adjustment to position its spindles properly, so that any irregularity of the wheels of a vehicle may be readily corrected.

A further object of the invention is to provide an axle which will serve to support the reach and the hounds of a vehicle.

The invention consists in the construction and novel combination and arrangement of parts, as hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended.

In the drawings, Figure 1 is a side elevation of an axle constructed in accordance with this invention. Fig. 2 is a longitudinal sectional view. Fig. 3 is a transverse sectional view on line 3 3 of Fig. 1. Fig. 4 is a similar view on line 4 4 of Fig. 1. Fig. 5 is an end view of one of the spindles.

Like numerals of reference designate corresponding parts in all the figures of the drawings.

1 1 designate spindles constructed of suitable metal and provided with central longitudinal bores or openings to receive the end portions 2^a of a connecting rod or bar 2. The end portions 2^a of the rod or bar are rounded and have threaded terminals, and the central or body portion of the rod or bar, which is constructed of flat metal, has its side faces vertical and extends across the space between the spindles, the ends of the body portion of the rod or bar 2 fitting in vertical recesses 1^a of the inner ends of the spindles, whereby the rod or bar is retained in its vertical position. The ends of the body portion of the rod or bar form shoulders, against which abut the spindles 1, and the latter are also spaced apart by a longitudinal sleeve 3, arranged on

and supported by the central connecting-rod and having its ends fitting in the recesses 1^b of the spindles. The sleeve 3 fits snugly on the central portion of the connecting-rod, and the ends of the latter are engaged by nuts 4, which abut against the outer ends of the spindles and secure the same to the connecting-rod. The spindles are provided at their inner ends with substantially rectangular enlargements 5, perforated at their corners and receiving the terminals of upper and lower tie-rods 8 and 9. The upper and lower tie-rods 8 and 9 are arranged in pairs, the lower ones being straight and provided with threaded terminals which pass through the lower perforations 7 of the enlarged ends of the spindles. The perforated portions or corners of the enlargements of the spindles project outward, forming ears, and the upper rods, which pass through the upper perforations of the enlargements of the spindles, are bowed upwardly to form truss-rods, the end portions 11 being bent at an angle and inclined, as shown. The terminals of the upper and lower rods are threaded and receive nuts 10 and 12, arranged in pairs on the inner and outer faces of the extensions. By adjusting the nuts 10 and 12 of the upper and lower tie-rods the spindles may be readily adjusted to bring the wheels in proper position to correct any irregularity in them. The upper portions of the enlargements are bent outward, as shown at 5^a, in order that the upper nuts may fit squarely against the faces of the same.

The axle is provided at the bends of the upper tie-rods with vertical struts 13, and it has a central strut 13^a, and each strut is composed of top and bottom sections 14 and 15 and intermediate sections 16 and 17. The top and bottom sections, which consist of blocks, are arranged above the upper tie-rods and below the lower tie-rods and are provided with grooves to receive the same. The intermediate sections, which consist of blocks similar to the upper and lower sections, are interposed between the upper and lower tie-rods and the central connecting-rod and the sleeve thereof, and they are provided at one face with a pair of grooves to receive the tie-rods and at the other face with a central groove to receive the sleeve and the central connecting-rod. The sections or blocks are provided

with registering perforations, through which pass vertical fastening devices 18, consisting of bolts. These bolts, which securely connect the sections, are provided at their lower ends with nuts and have their heads counter-sunk or seated in recesses of the upper section.

The upper section of each strut is provided with upwardly-extending flanges 19, forming a recess or seat. The recesses of the side struts are adapted for the reception of the hounds of a running-gear, and the central recess receives the reach. The axle illustrated in the accompanying drawings is a rear axle, the front axle being constructed similar to that herein shown and described, with the exception that the flanges 19 of the upper section of the central strut are left off to provide a flat upper face, and the sections 14 and 16 of the central strut will then be provided with a central vertical perforation for the reception of the king-bolt.

The invention has the following advantages: The axle, which is simple and comparatively inexpensive in construction, possesses great strength and durability and at the same time is comparatively light. The upwardly-bowed tie-rods and the vertical struts form a truss of the axle and enable the same to sustain great weight without liability of the wheels spreading. By adjusting the nuts of the tie-rods the spindles may be set at the desired angle to bring the wheels of a vehicle in proper position.

Changes in the form, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

What I claim is—

1. An axle comprising a central rod, a pair of spindles arranged at the ends of the rod and adapted to be adjusted upward and downward to arrange them at the proper angle, and the upper and lower tie-rods adjustably secured to the spindles and securing them in their adjustment, substantially as described.

2. An axle comprising a pair of spindles having central bores or openings and provided at their inner ends with perforated enlargements, a central connecting-rod passing through the bores or openings of the spindles and secured to them, upper and lower tie-rods having threaded terminals passing through

the perforations of the enlargements of the spindles, and the nuts arranged in pairs on the ends of the tie-rods and engaging the inner and outer faces of the enlargements of the spindles and adapted to secure the latter at the proper adjustment, substantially as described.

3. An axle comprising a pair of spindles, upper and lower tie-rods arranged in pairs, one pair of tie-rods being bowed, a central rod connecting the spindles, vertical struts composed of sections or blocks interposed between the rods and having grooves receiving the same, and fastening devices connecting the blocks or sections of the struts, substantially as described.

4. An axle comprising spindles, upper and lower tie-rods, and a strut connecting the tie-rods and provided at its top with flanges forming a recess to receive a hound or the reach of a running-gear, substantially as described.

5. An axle comprising a pair of spindles, a connecting-rod passing through the spindles and having a central enlarged portion interlocked with their inner ends, and a sleeve arranged on the enlarged portion of the connecting-rod and interposed between and bearing against the spindles, substantially as described.

6. An axle comprising a pair of spindles, upper and lower tie-rods, a central connecting-rod passing through the spindles, and a sleeve arranged on the connecting-rod and interposed between the spindles, substantially as described.

7. An axle comprising a pair of spindles, a central connecting-rod composed of an angular body portion, interlocked with the spindles and end portions, extended through the spindles, a longitudinal spacing-sleeve arranged on the connecting-rod and abutting against the inner ends of the spindles and fitting in recesses thereof, and means for securing the spindles to the connecting-rod, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

FRANK MARION ARNOLD.

Witnesses:

NICK WALERINS,
EDWARD C. CASS.