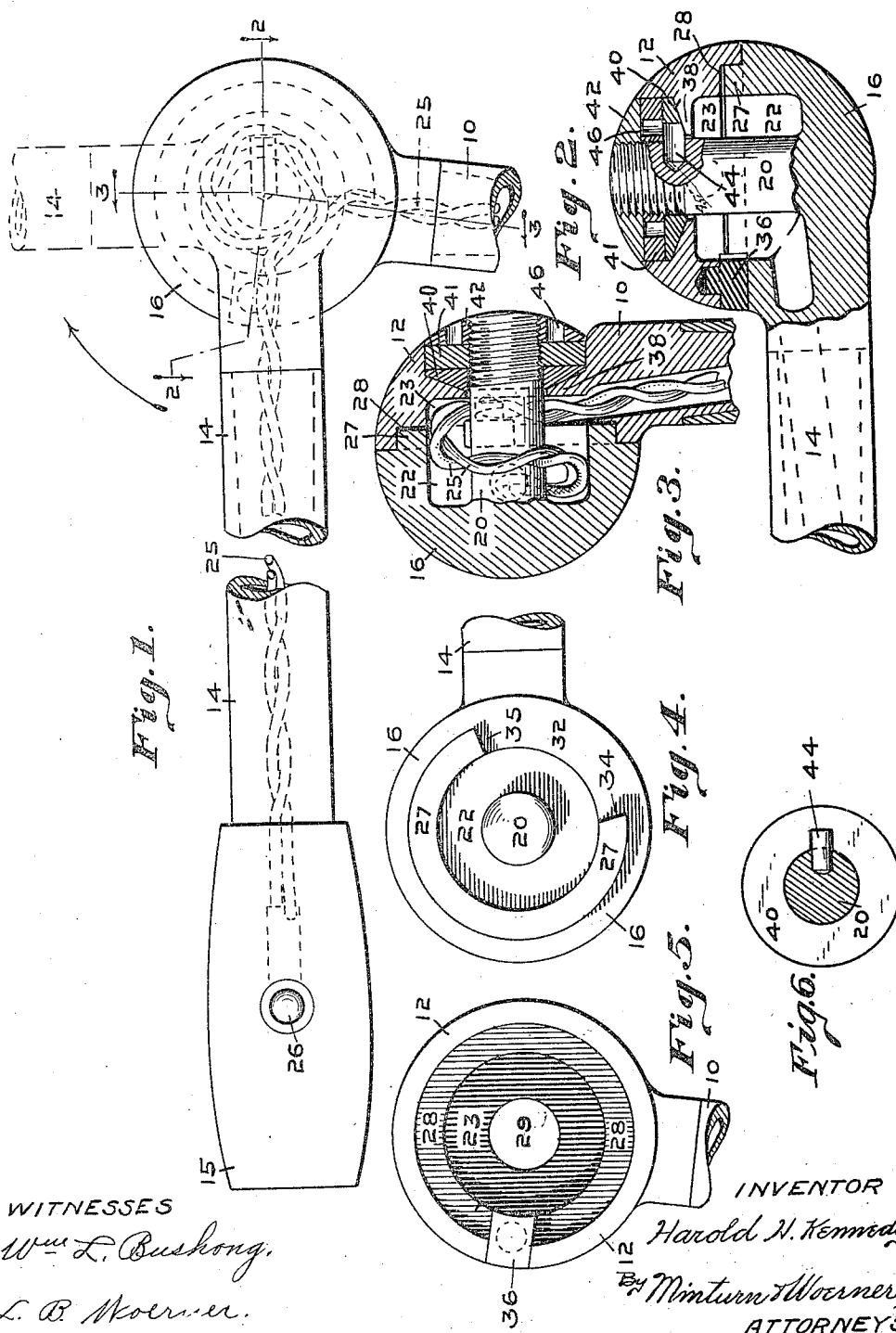


Patented May 6, 1913.

1,060,606.



WITNESSES
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UNITED STATES PATENT OFFICE.

HAROLD H. KENNEDY, OF INDIANAPOLIS, INDIANA, ASSIGNOR TO THE WAVERLY COMPANY, A CORPORATION OF INDIANA.

STEERING-KNUCKLE.

1,060,606.

Specification of Letters Patent.

Patented May 6, 1913.

Application filed April 24, 1911. Serial No. 623,131.

To all whom it may concern:

Be it known that I, HAROLD H. KENNEDY, 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 Steering-Knuckles, of which the following is a specification.

This invention relates to a joint or knuckle for steering-posts in electrically driven motor vehicles; and the object of the invention is to provide a steering-post of the above character with a knuckle or joint which is simple in construction, compact, neat in appearance, strong and durable.

A further object of the invention is to provide a knuckle or joint of the above character wherein a conduit is formed to receive and conceal the electric wires running from the motor to the switch, thus removing all wires from the exterior of the steering-post and also enabling the switch to be placed in an extremely convenient and readily accessible position within the grip or handle of the steering-arm.

I accomplish the objects of the invention by means of the knuckle or joint illustrated in the accompanying drawings, forming a part hereof, in which—

Figure 1 is a fragmentary detail view in front elevation of the steering-post and steering-arm, the latter occupying its lowest position, as when the vehicle is in motion. Fig. 2 is a fragmentary detail horizontal sectional view, on the line 2—2 in Fig. 1. Fig. 3 is a fragmentary detail central vertical sectional view on the line 3—3 in Fig. 1. Fig. 4 is a plan view of the inner face of the semi-spherical enlargement on the end of the steering-arm and forms a part of the knuckle or joint. Fig. 5 is a plan view of the inner face of the semispherical enlargement on the end of the steering-post and forms the remaining portion of the knuckle or joint. Fig. 6 is a cross section of the spindle, showing the washer and retaining pin, the remaining construction of the steering device being omitted.

Referring to the drawings, the vertically disposed steering-post or staff, common to electrically driven motor vehicles, comprises a hollow tube 10, having secured to its upper end a semi-spherically shaped member 12 that forms, approximately, one-half of the bearing or joint between said post and

steering-arm. The arm comprises a hollow tube 14 which is provided on one end with a grip or handle 15 and the opposite end of the arm is provided with a semi-spherically shaped member 16, similar to the member 12, the two members 12 and 16 forming the bearing between the steering-post and steering-arm. To securely hold the semi-spherically shaped members 12 and 16 together in operative position the member 16 is provided on its flat surface with a centrally located threaded spindle 20 of sufficient length to project through the member 12 when the two occupy an assembled position.

The face of the member 16 is cut away around the base of the spindle 20 to form an annular recess 22, and the member 12 is provided with a similar recess 23, the two recesses providing a passageway for conducting the wires 25 around the spindle 20. The chamber formed by the recesses 22 and 23 communicates with the hollow interior of the steering post 10 and the steering-arm 14 so that an unobstructed conduit or passageway is provided for the wires running from the switch 26, located within the grip 15 on the steering-arm 14, to the motor, not shown.

When the semi-spherically shaped members 12 and 16 are in an assembled condition the former is susceptible of independent rotary movement with respect to the latter, thereby enabling the steering-arm 14 to be elevated into a vertical position, as shown by means of the dotted lines in Fig. 1. In this position the arm will not interfere with the movements of the operator in getting into or out of the vehicle. This independent movement of the arm and member 16 is limited generally to about 90 degrees, the distance of travel being controlled by providing an annular groove 28 cut into the flat face of the member 12 and a correspondingly shaped rib 27 on the flat face of the member 16 which rib rides in said groove. A portion of the rib 27 is cut away, as shown at 32, to provide the two shoulders 34 and 35. A stop-block 36 is set into the flat face of the member 12 and arranged to extend across the groove 28 and acts as a barrier for limiting the travel of the member 16 when either of the shoulders 34 and 35 engage said stop-block. The length of rotary travel of the arm depends on the position of the shoulders 34 and 35 and the positions

of these are determined by the amount of metal removed from the rib 27.

As hereinbefore stated, the member 16 is provided with the threaded spindle 20 which projects through an aperture 29 in the member 12. The aperture 29 is enlarged to increase its diameter to make room for the washer 40, lock-nut 41 and outer nut 42 which screw down on the threaded end of the spindle 20 and whereby the members 12 and 16 are drawn and held together. The above arrangement removes the nuts from the surface of the member 12 leaving its outer surface smooth and free from obstructions. The increased diameter of the aperture 29 also provides the necessary shoulder 38 upon which the washer rides when the member 16 is rotated. The face of the shoulder 38 against which the washer 40 acts is cone-shaped, as shown, and the face of the washer is formed to correspond thereto. The tendency of these cone-shaped surfaces when brought together is to hold the members 12 and 16 into alinement. The washer 40 is held stationary, so that the rotary travel of the member 16 will not loosen the lock-nut 41, by means of a horizontally disposed pin 44 which is inserted in a recess 45 in the spindle 20 before the washer 40 is placed into position. The lock-nut 41 serves to maintain a uniform working relationship between the parts when the latter have once been adjusted. This construction further enables the parts to be readjusted to overcome wear and permits the tension on the parts to be changed to suit conditions. After the lock-nut has been placed into position the aperture 29 is entirely closed, leaving the exterior surface of the member 12 smooth and thus adding to the general appearance of the device, by inserting the outer-nut 42, the exposed surface of which is cut on a curve to conform to the curve on which the adjacent surfaces of the members 12 and 16 are cut, thereby leaving the outline of the sphere unbroken. The nuts 41 and 42 (see Figs. 2 and 3) are provided with the apertures 46, situated at opposite points, adapted

to receive a suitable spanner-wrench by which said nuts are forced into position. 50

Having thus fully described my said invention, what I desire to secure by Letters Patent, is—

1. The combination, with a steering-post, a steering arm, an enlargement formed on one end of the post and arm, an annular groove formed in one of the enlargements, a segmental rib formed on the other enlargement, said rib adapted to engage said groove, means to limit the rotary travel between said enlargements, and means for holding said post and arm in operative relation. 55

2. The combination, with a steering-post, an enlargement thereon, an annular groove formed in the face of said enlargement, a steering-arm, an enlargement formed thereon, a rib formed on the face of said enlargement and adapted to ride in said groove, means extending across said groove to limit the rotary travel of said arm, and means for holding the post and arm in operative relation. 60

3. The combination, with a steering-post, an enlargement formed on said post and provided with a transverse aperture, an annular groove formed in the face of said enlargement, a steering-arm, an enlargement formed thereon, a rib formed on the face of said enlargement and adapted to ride in said groove, a spindle on the enlargement on said arm adapted to extend through the aperture in the enlargement on the post, a washer adapted to form a bearing for the free end of the spindle, means to prevent independent rotary movement of said washer on said spindle, and means for holding the washer, post and arm in operative relation. 75

In witness whereof, I have hereunto set my hand and seal at Indianapolis, Indiana, this, 18th day of April, A. D. one thousand nine hundred and eleven. 80

HAROLD H. KENNEDY. [L. S.]

Witnesses:

JOSEPH A. MINTURN,
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