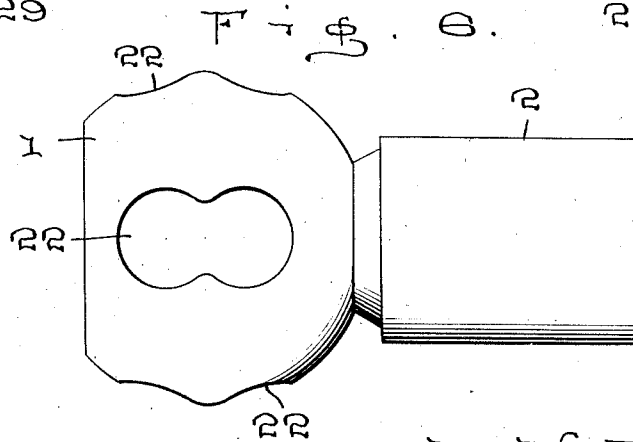
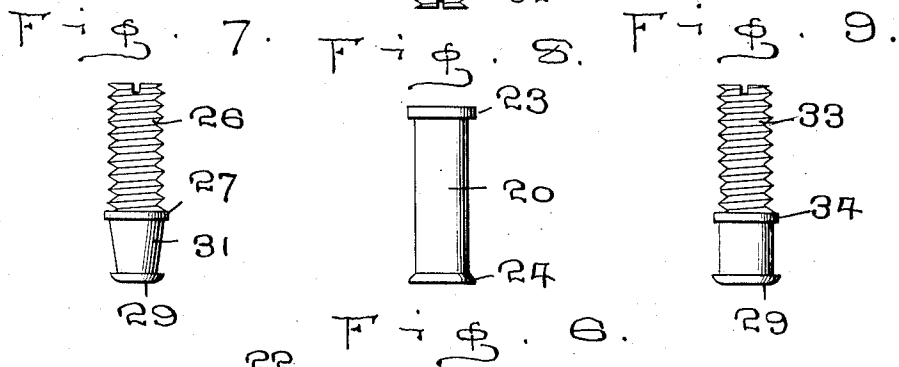
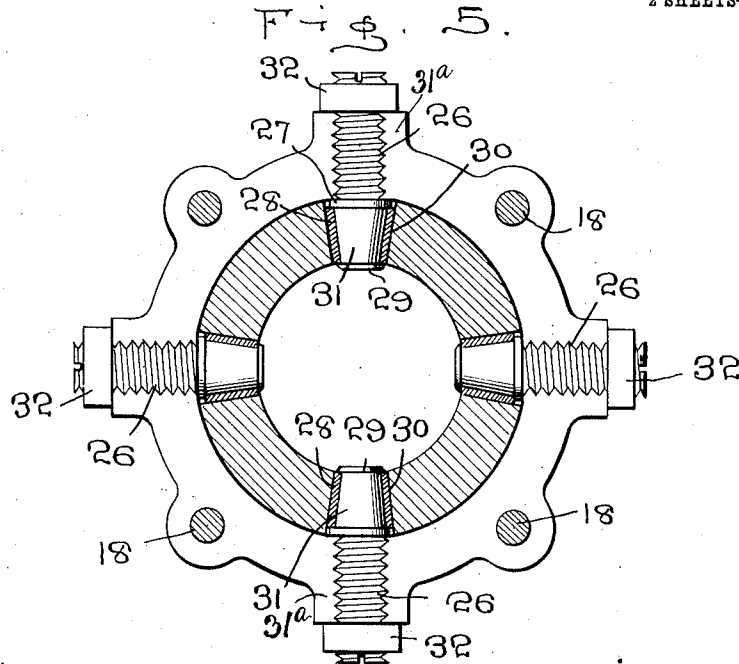


A. H. FETZER.
UNIVERSAL JOINT.
APPLICATION FILED JAN. 12, 1909.

959,129.

Patented May 24, 1910.

2 SHEETS—SHEET 2.



WITNESSES:

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M. A. Newcomb.

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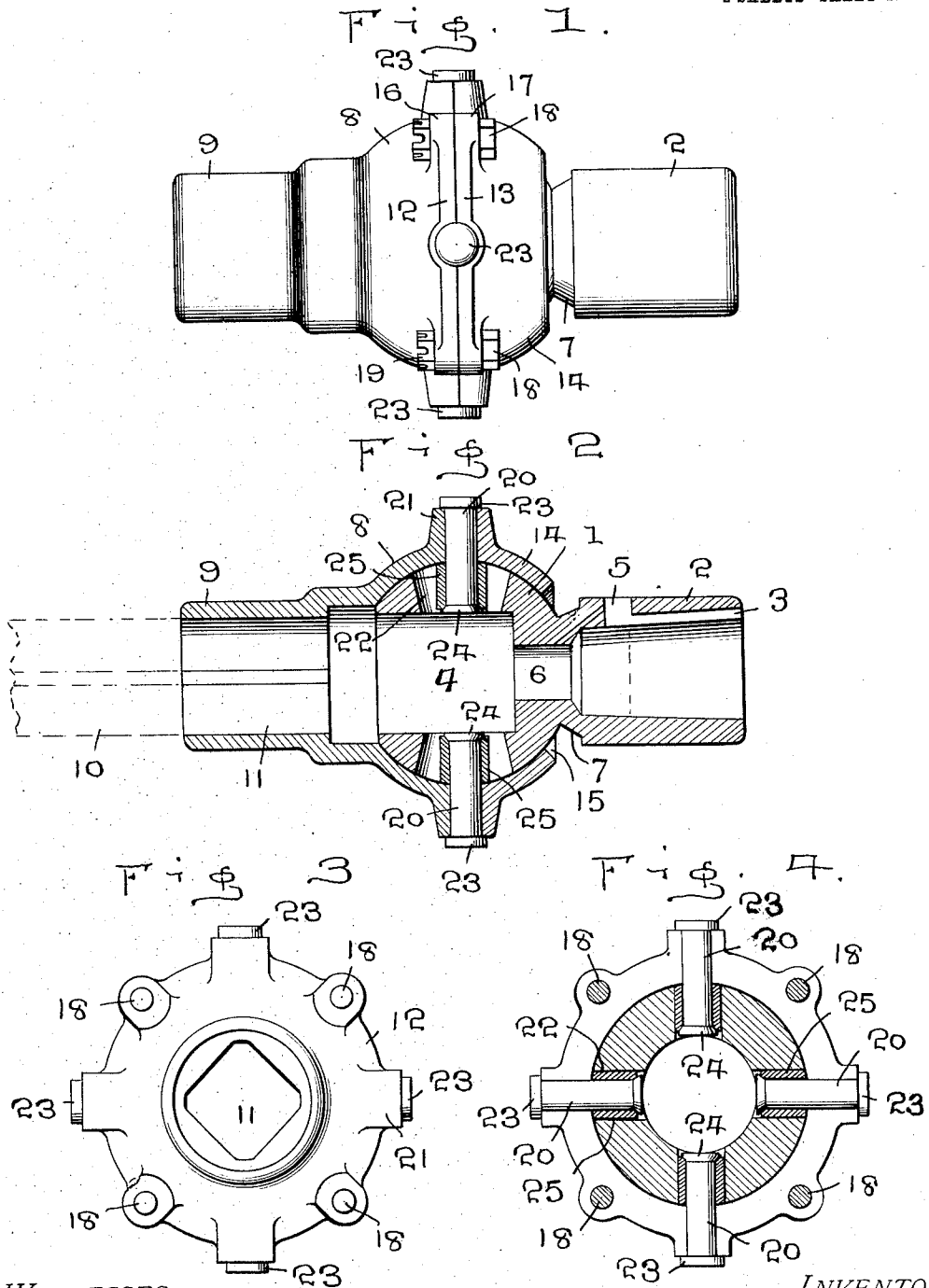
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UNITED STATES PATENT OFFICE.

ALLEN H. FETZER, OF GALION, OHIO.

UNIVERSAL JOINT.

959,129.

Specification of Letters Patent.

Patented May 24, 1910.

Application filed January 12, 1909. Serial No. 471,939.

To all whom it may concern:

Be it known that I, ALLEN H. FETZER, a citizen of the United States, residing at Galion, in the county of Crawford and State of Ohio, have invented certain new and useful Improvements in Universal Joints; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to new and useful improvements in universal joints and more particularly to that class adapted to be used in connection with four-wheel drives and my object is to provide a device of this class whereby an axle having a swinging spindle may be driven without interfering with the movement of the spindle.

A further object is to provide means for readily assembling the parts of the joint together.

A still further object is to provide suitable anti-friction devices for the wearing parts of the joint.

A still further object is to provide means for adjusting the anti-friction parts when desired and a still further object is to provide a suitable lubricant chamber within parts of the joint.

Other objects and advantages will be hereinafter referred to and more particularly pointed out in the claims.

In the accompanying drawings forming part of this application, Figure 1 is an elevation of the universal joint in its assembled position. Fig. 2 is a central longitudinal sectional view thereof. Fig. 3 is an end elevation thereof. Fig. 4 is a vertical transverse sectional view through the joint. Fig. 5 is a similar view of a slightly modified form of joint. Fig. 6 is an elevation of the ball removed from its socket, and, Figs. 7, 8 and 9 are elevations of studs employed for holding the anti-friction devices in engagement with the ball.

Referring to the drawings in which similar reference numerals designate corresponding parts throughout the several views, 1 indicates the ball of my improved universal joint, from which extends a sleeve 2, said sleeve being adapted to receive the end of any suitable form of spindle, the interior of said sleeve being preferably provided with a key seat 3, into which a key is to be introduced to secure the spindle in the sleeve.

Extending into the ball 1 at a point diametrically opposite the sleeve 2, is a chamber 4, into which may be introduced any suitable form of lubricant and by providing solidified lubricant, a sufficient quantity may be placed in the chamber at one time to properly lubricate the wearing parts of the joint for a considerable length of time, but should a liquid lubricant be used, it may be introduced through a port 5 in the sleeve 2 and from thence into the chamber 4 through an opening 6, which opening extends centrally through the neck 7 between the ball and sleeve.

The open end of the ball 1 is adapted to enter a semi-globular socket 8, which socket is provided with a sleeve 9, into which enters the shaft 10 and in order to positively rotate the semi-globular socket with the shaft, the opening 11 in the sleeve to receive the shaft, is preferably square in cross section, that portion of the sleeve adjacent the semi-globular socket being greater in diameter than the portion of the sleeve engaging the shaft, thereby permitting the ball 1 to readily move in the semi-globular socket. The free end of the semi-globular socket 8 terminates in an upstanding flange 12 against which abuts a similar flange 13 extending upwardly from an auxiliary socket 14, said auxiliary socket having an opening 15 through which the sleeve 2 and neck 7 extend, the opening 15 being greater in diameter than the diameter of the neck 7, whereby the sleeve 2 may be swung laterally with respect to the shank 9 and axle to which the same is secured. The flanges 12 and 13 are provided at suitable intervals with registering ears 16 and 17, respectively, through which extend clamping bolts 18, one end of said bolts being preferably threaded to receive nuts 19.

The ball 1 is positively driven with the semi-globular sockets 8 and 14 by means of studs 20, which studs extend vertically through sockets 21 formed on the flanges 12 and 13, the lower ends of said studs extending into slots 22 formed in the periphery of the ball 1, the upper ends of said studs having heads 23, thereon which engage the upper ends of the sockets 21, while the lower ends of said studs are upset to form flanged heads 24, said flanged heads being employed for retaining anti-friction rings 25 on the studs 20. The slots 22 are preferably enlarged at their ends to form substantially

8-shaped openings, whereby the ball will have a substantially knuckle joint action with respect to its socket, thereby permitting the sleeve 2 and axle attached thereto to be swung forwardly and rearwardly to guide the vehicle, the anti-friction rings 25 engaging the walls of the slots 22 as the studs 20 are moved from end to end of the slots.

10 In Fig. 5 of the drawing, I have shown a slightly modified form of slots and studs cooperating therewith and in this instance, the sockets 31^a are threaded to receive the threaded shank 26 of the studs, the upward movement of the studs being limited by providing the same with integral collars 27, which collars engage the lower ends of the sockets through which the studs extend and also form shoulders for the upper ends of the anti-friction rings 28, said rings being held in position on the studs by means of heads 29. The slots 30 in this instance, are preferably tapered from their upper to their lower edges, the rings 28 and studs 31 being likewise tapered to conform to the taper of the slots 30 and it will be readily seen that as the walls of the slots and anti-friction rings become worn, the studs may be turned down in their sockets 11 and thereby caused to snugly fit the walls of the slots. After the stems have been properly adjusted, a lock nut 32 is turned onto the upper end of the threaded portion 26 and into engagement with the upper ends of the sockets, thereby securely locking the studs in their adjusted positions, as shown in Fig. 5.

The form of stud shown in Figs. 1 to 4 may be provided on its upper portion with threads 33, while a collar 34 may be placed on the stud at the termination of the thread to form a stop for the upper ends of the anti-friction rings 25, said studs to be provided with the locking nuts 32, as shown in Fig. 5.

45 In assembling the parts of the universal joint, the sleeve 2 is first introduced through the opening 15 and the concave portion of the auxiliary semi-globular socket 14, seated on the ball 1, after which the opposite portion of the ball is entered into the semi-globular socket 8, the studs 20 having previously been entered in their respective slots 22 and brought into registration with the semi-circular openings in the sockets 21. After the two socket sections 8 and 14 are brought together, the bolts 18 are introduced through the ears 16 and 17 and the nuts 19

turned thereon, this operation securely clamping the two socket sections 8 and 14 together. The sleeve 9 is then attached to the shaft 10 and a spindle secured in the sleeve 2, when the universal joint is ready for use; and it will be readily seen that by forming the slots in the manner shown and directing the studs in the slots, the ball will be permitted to pivot in the two socket sections and at the same time caused to rotate therewith.

This form of joint may be very cheaply constructed and quickly assembled together or separated, as the case may require and by introducing the lubricant into the ball as shown, the necessity of oiling the wearing parts of the joint will be reduced to a minimum.

What I claim is:

1. A device of the character described, comprising complementary semi-globular socket-members, having complementary recesses forming stud-sockets, means for connecting together said socket members, a ball member received by said complementary semi-globular socket members, having slots therethrough, said slots being substantially 8-shaped in general outline, studs forming trunnions, received by said stud sockets, and ring members arranged upon said trunnion forming studs, said trunnion forming studs engaging said 8-shaped slots and having heads upon their ends engaging the outer ends of said sockets and the inner edges of said ring members, respectively.

2. A device of the character described, comprising complementary semi-globular socket members, having complementary recesses forming stud-sockets, means for connecting together said semi-globular socket members, a ball-member received by said semi-globular socket members, having slots therethrough, said slots being substantially 8-shaped in general outline, ring members applied to said studs, said studs having screw-threaded extensions engaging the inner walls of said recesses, said studs also having collars at the inner ends of their threaded portions and tapered heads received by said 8-shaped slots.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ALLEN H. FETZER.

Witnesses:

H. R. SCHULER,
DOROTHY SHEELS.