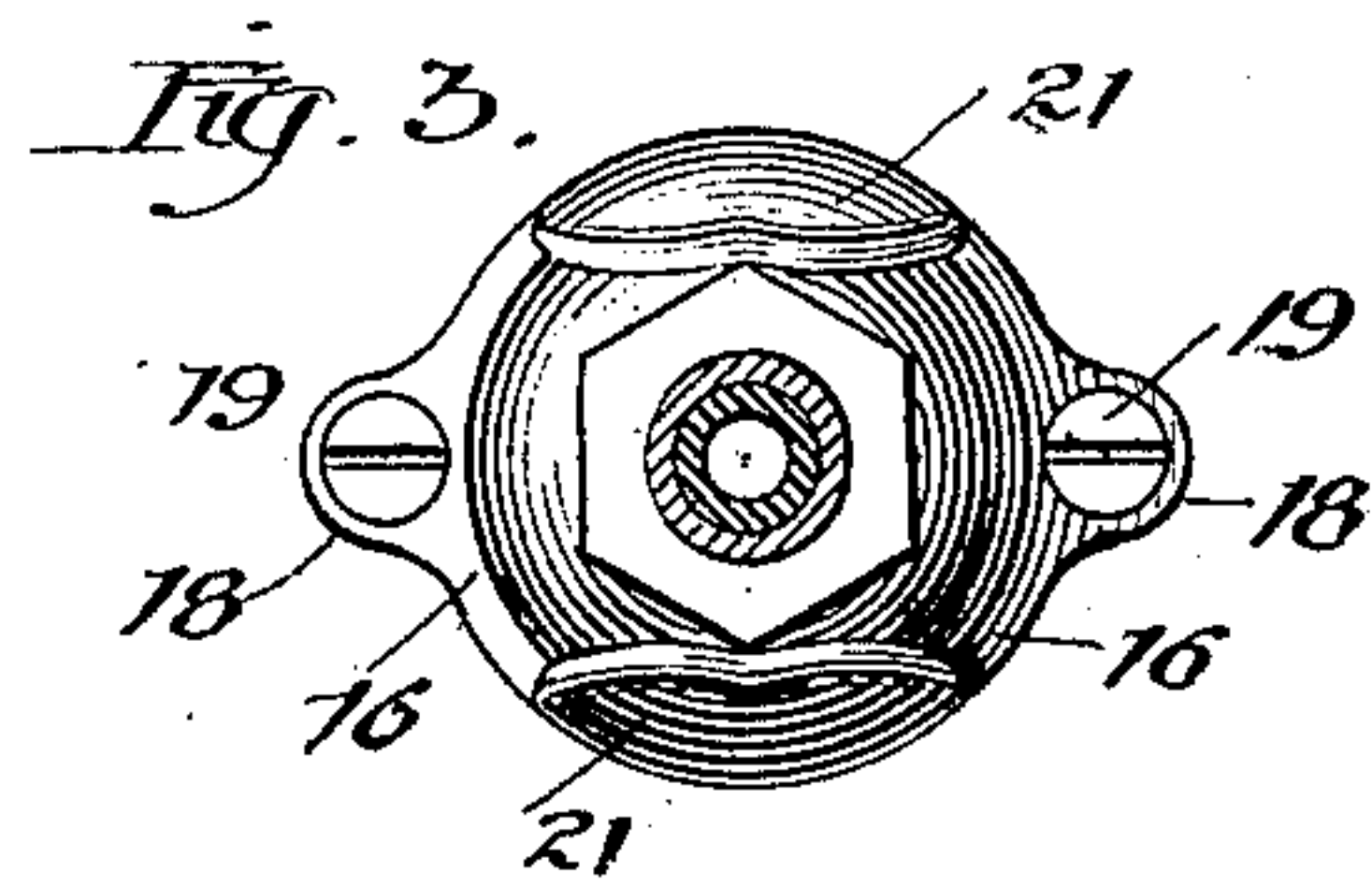
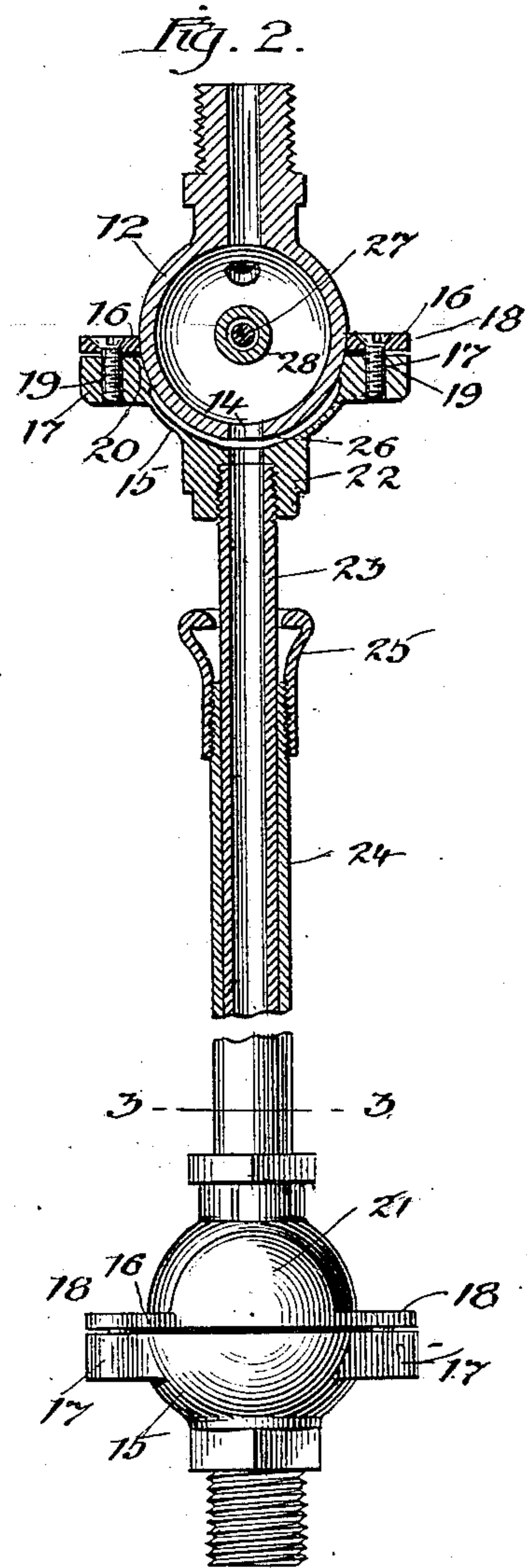
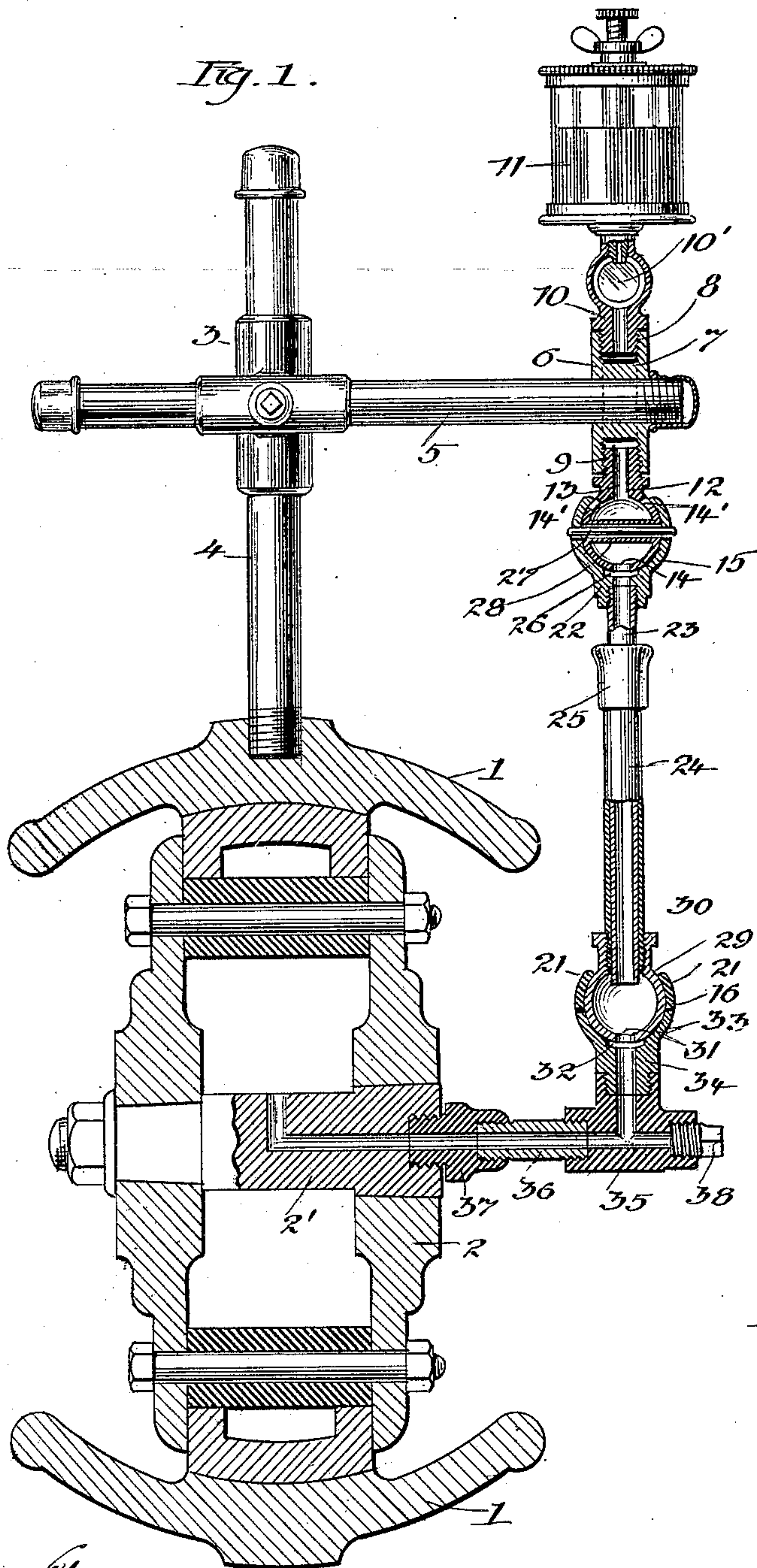


No. 847,432.

PATENTED MAR. 19, 1907.

W. W. NUGENT.
BALL JOINT LUBRICATING APPARATUS.

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UNITED STATES PATENT OFFICE.

WILLIAM W. NUGENT, OF CHICAGO, ILLINOIS.

BALL-JOINT-LUBRICATING APPARATUS.

No. 847,432.

Specification of Letters Patent.

Patented March 19, 1907.

Application filed January 20, 1906. Serial No. 296,965.

To all whom it may concern:

Be it known that I, WILLIAM W. NUGENT, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Ball-Joint-Lubricating Apparatus, of which the following is a specification.

This invention relates to improvements in ball-joint-lubricating apparatus of that type adapted for oiling the cross-head pins of reciprocating-engines and other analogous uses.

The salient objects of the invention are to provide an improved form of joint between the stationary and movable parts of the oiler, which enables the apparatus to be utilized for oiling movable parts which move in paths other than rectilinear—as, for example, a part of an engine which moves in a curved path; to provide a construction which is equally well adapted for use in oiling parts having rectilinear motion, in which case the necessity of adjusting the stationary parts of the oiling apparatus in parallelism with the line of movement of the moving part to be oiled is obviated; to provide an improved construction which enables the joint to be adjusted from time to time to compensate accurately for wear and in this manner obviate the necessity of using a compressible packing with its incident objections; to provide a form of construction which insures a free and unobstructed flow of the oil independently of the angular position of the joint members relatively to each other within reasonable limits; to provide a construction which may be economically and conveniently manufactured, and in general to provide an improved construction and apparatus of the character referred to.

To the above ends the invention consists in the matters hereinafter described, and more particularly pointed out in the appended claims.

In the drawing, Figure 1 is a view showing chiefly in vertical section the cross-head of an engine mounted between the cross-head slides and equipped with a preferred embodiment of the invention. Fig. 2 is a detail showing, on a larger scale, the telescoping and ball joints, parts being shown in axial section. Fig. 3 is a view taken on line 3 3 of Fig. 2 and looking downwardly.

Referring to the drawing, 1 designates as a whole a cross-head-slide casting within which

reciprocates a cross-head, (designated as a whole by 2.)

3 designates a suitable supporting-bracket mounted on the upper side of the slide-casting and comprising an upright or standard 4 and a horizontal arm 5. Upon the end of the arm 5 is fixed a ring-casting 6, which is cored to provide an internal closed passage 7, which extends from the upper side of the ring around to the lower side thereof, and with the upper and lower sides of which passage communicate, respectively, screw-plug apertures 8 and 9. In the upper aperture 8 is seated the screw-plug shank 10 of the oil-cup 11, which latter may be of any suitable construction. In the present instance the shank is shown as provided with a closed peep-opening 10', through which the oil passing from the oil-cup to the ring-casting is exposed to view. With the lower screw-plug aperture is connected the shank of a hollow ball-joint member 12. Said shank is axially bored, as indicated at 13, to provide a passage leading from the interior of the ring-casting to the interior of the ball member, and the latter is also provided at a point below its horizontal center with a discharge-outlet 14 and at its upper side with one or more vent-openings 14'.

The cooperating member of the ball-joint consists of a partispherical cup member 15, within which the lower part of the ball member fits and is seated, and a union ring 16, which fits and encircles the ball member in a zone slightly above its horizontal center plane. The cup member is provided at diametrically opposite points with radial ears 17 and the union ring with similar ears 18, adapted to register therewith. Clamping-screws 19, inserted through said ear members, serve to unite said parts, the union ring being spaced away from the cup member slightly by the insertion of one or more washer-like shims, as indicated at 20, which shims may be successively removed and the parts set closer together to compensate for wear.

The union ring is provided at diametrically opposite sides with partispherical lips 21, which embrace the upper spherical part of the ball member and increase the wearing area of the joint and more securely unite the parts. The cup member 15 has at its lower side a socket extension or shank 22, which is internally threaded and connected with a conductor tube or duct 23.

The lower portion of this tube telescopes and fits within another tube 24, which is preferably provided at its upper end with a bell-like oil-guard 25, which prevents the oil from creeping upwardly between the telescoping parts and out over the exterior of the outer tube.

The interior of the cup member 15 around the outlet 14 of the ball member is recessed, as indicated at 26, to provide a chamber with which said outlet 14 will at all times communicate regardless of the angle at which one member of the joint happens to be flexed relatively to the other.

I have found in practice that it is undesirable, if not impractical, to permit the cup member to rotate upon an axis coincident with the axis of the tube 23, with which it is connected, and to prevent this I insert a through-pin 27 through the union ring and through the center of the ball member. In order to seal the passage-way through the ball member within which the through-pin extends, said ball member is provided with an internal integral tubular cross-bar 28, the internal diameter of which is considerably greater than the diameter of the through-pin, so that notwithstanding the ends of the through-pin are firmly seated in the union ring, nevertheless considerable movement of the cup member and union ring relatively to the ball member is permitted in a direction coincident with a plane parallel with said through-pin and the tube 23. Movement in a direction at right angles to this plane is of course unimpeded by the presence of the through-pin.

The lower end of the outer conductor-tube 24 connects with a ball-joint substantially like that above described, except that in this lower joint the through-pin is omitted, since it would be superfluous. The ball member 29 is in this instance provided with a socket-shank 30, into which the lower end of the tube 24 threads, and the vents of the upper ball member are omitted. An outlet-aperture 31 is provided in the ball member, which communicates with a recess or chamber 32 in the cup member 33, as in the upper joint. The parts are united by a union ring 16, like that first described. The apparatus is shown as applied to oil the connecting-pin 2' of the cross-head, and accordingly the lower end of the lower cup member 33 terminates in a threaded shank 34, which fits into a T-union 35, and the latter communicates with an axial passage in the pin 2' through a tube-section 36 and union plug 37. For convenience in cleaning out the duct leading through the connecting-rod pin and T-union and also in order that an indicator-reducing-motion mechanism may be attached to the end of the T-union when desired the latter is provided in its outer end with a removable screw-plug 38.

The use of the apparatus is obvious from the foregoing description.

It may be noted that the details of construction of the ball-joints are important in securing an effective device which will not leak in operation, which will adjust itself to various angles and which may be readily adjusted to compensate for wear from time to time, thus preventing loose joints and leakage. The enlarging or chambering of the receiving end of the passages through the cup members serves a double function—namely, it enables one member of the joint to be oscillated or flexed relatively to the other without obstructing the free oil-passage there-through, and it also insures that under normal conditions the oil will drop freely from the discharge-orifices of the ball members, and thus prevents the oil from creeping up over the meeting surfaces and out between the joints. In its broader aspect, however, the invention is not limited to the precise details of construction described.

I claim as my invention—

1. In an oiling apparatus, the combination with a suitable receptacle from which the oil is delivered, of a tubular oil-conductor connected and communicating with said receptacle and a ball-joint in said conductor comprising a ball member provided with a connecting-terminal and having an oil-passage leading through the terminal and through the body of the member, a cup member receiving that part of the ball member remote from the connecting-terminal and also having a passage, communicating with the passage of the ball member, a union ring encircling and embracing that hemisphere of the ball member opposed to the part which fits within the cup member, diametrically-opposed partispherical extensions upon said ring member, means limiting axial rotation of the ball member relatively to the cup member, ears upon the cup member and union ring, respectively, and bolts uniting said ears.

2. In an oiling apparatus, the combination with a suitable receptacle from which the oil is delivered, of a tubular oil-conductor connected with said receptacle and adapted to convey the oil to a moving part and a ball-joint in said conductor comprising a ball member provided with a connecting-terminal and an oil-passage leading through the terminal and body of the member, a cup member receiving that part of the ball member remote from the connecting-terminal and having a passage communicating with the passage of the ball member, the receiving end of which passage is enlarged, a union ring encircling that hemisphere of the ball member opposed to the part thereof which fits within the cup member, means uniting the union ring and cup member, and means limiting the extent of axial rotation of the cup member

relatively to the ball member comprising a tubular member extending across the interior of the ball member and a through-pin inserted through said tubular member and having its ends seated in the union ring.

3. In an oiling apparatus, the combination, with a suitable receptacle from which the oil is delivered, of a tubular oil-conductor connected with said receptacle and adapted to convey the oil to a moving part, and a ball-joint in said conductor comprising a ball member provided with a connecting-terminal and an oil-passage leading through the terminal and body of the member, a cup member receiving that part of the ball member remote from the connecting-terminal and hav-

ing a passage communicating with the passage of the ball member, the receiving end of which passage is enlarged, a union ring encircling that hemisphere of the ball member opposed to the part thereof which fits within the cup member, and journal connections between said ball and ring member permitting axial rotation of the cup member relative to the ball member and at the same time allowing limited oscillatory movement of the cup member in planes approximately at right angles to its axial rotation.

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