

No. 802,299.

PATENTED OCT. 17, 1905.

VLADIMIR LORENC & VICTOR LORENC.

UNIVERSAL JOINT.

APPLICATION FILED NOV. 30, 1904.

2 SHEETS—SHEET 1.

Fig. 1.

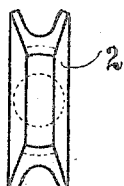
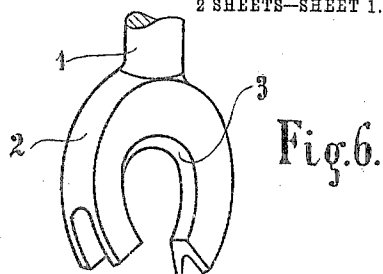


Fig. 2.

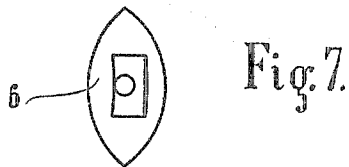


Fig. 3.

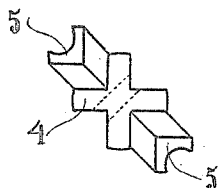


Fig. 11.

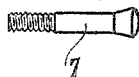
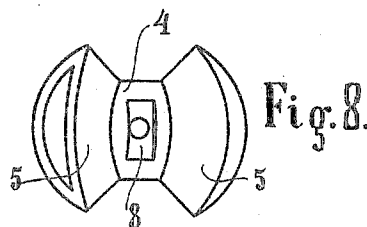


Fig. 4.

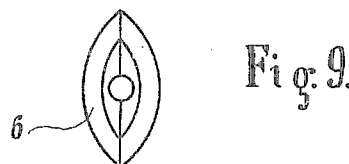
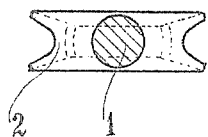
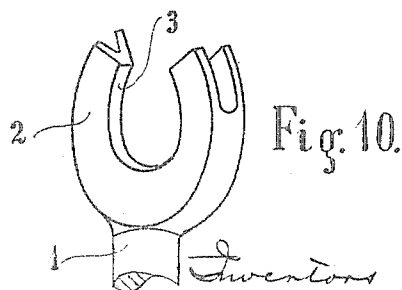


Fig. 5.



Witnesses:
E. O. Hedegard
Jessamine L. Palmer

Inventors
Vladimir Lorenc
and Victor Lorenc
by Georgii Massiel
Attorneys

Fig. 12.

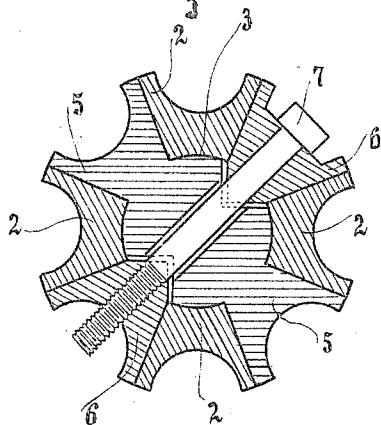


Fig. 13.

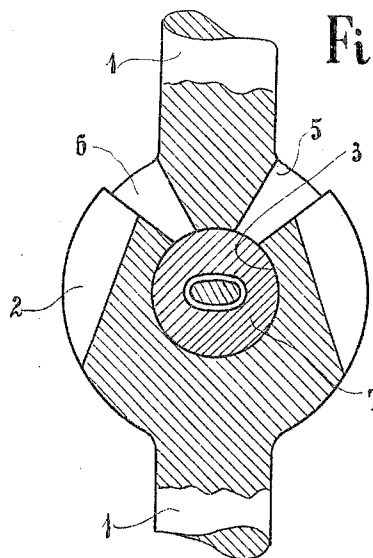


Fig. 14.

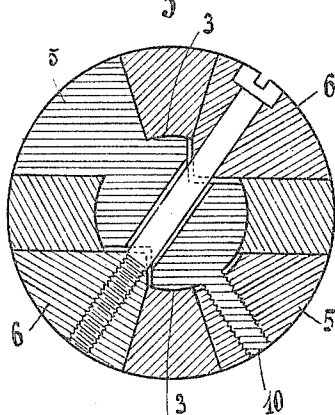
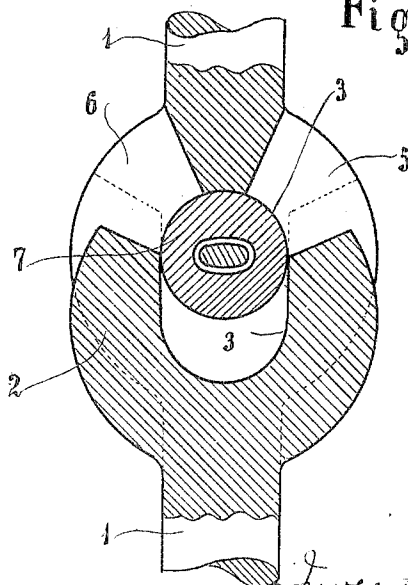


Fig. 15.



Witnesses:

E. C. Niedemann
Jessamine L. Palmer

Inventors:

Vladimir Lorenc
and Victor Lorenc
by Georgii Massis
Attorneys

UNITED STATES PATENT OFFICE.

VLADIMIR LORENC AND VICTOR LORENC, OF BERLIN, GERMANY.

UNIVERSAL JOINT.

No. 802,299.

Specification of Letters Patent.

Patented Oct. 17, 1905.

Application filed November 30, 1904. Serial No. 234,927.

To all whom it may concern:

Be it known that we, VLADIMIR LORENC and VICTOR LORENC, engineers, residing at Berlin, in the Empire of Germany, have invented certain new and useful Improvements in Universal Joints; and we 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.

This invention relates to a joint in which the whole of the bearing-surfaces can be adjusted in the simplest manner.

The chief feature of the new universal joint consists in utilizing one and the same ball-pin for supporting the ends of the two spindles. These spindles or other movable elements surround with their bifurcated ends the ball-pin in such manner that the two forks are situated in two planes at a right angle to each other, this relative position of the two forks being insured by suitably-shaped ribs on the ball-pin. The adjustment is effected by making the ribs in question wedge-shaped and separating at least two of them from the ball-pin, so that by tightening the movable ribs the forks can always be pressed against the fixed ribs.

In the accompanying drawings, Figure 1 is the forked end of the one spindle in end view; Fig. 6, the same in perspective view; Fig. 2, an end elevation, and Fig. 7 a side elevation, of one of the detachable ribs; Fig. 3 and Fig. 8, front and side elevations of the ball-pin. Figs. 4 and 9 are end and side elevations of the second detachable rib. Fig. 5 and Fig. 10 are an end and a perspective view of the other bifurcated spindle end. Fig. 11 is the adjusting or set screw. Fig. 12 and Fig. 13 are respectively a cross-section and longitudinal section of the joint when fitted up on a larger scale. Figs. 14 and 15 show another construction of the joint in cross and longitudinal sections on a larger scale.

1 1 are the spindles, the ends of which are to be connected by the universal joint. The ends of these spindles are provided with forks 2 2, Figs. 1 and 6 and 5 and 10, which engage with the ball-pin 4 by means of their semicircular or more than semicircular surfaces 3. The ball-pin 4 is provided with ribs 5 5 and 6 6, which insure the planes of the two forks 2 2 remaining at a right angle to each other. In the drawings the two opposite ribs 5 5 are made in one piece with the ball-pin, the other opposite ribs 6 6 being

separate from the ball-pin and connected to it by means of a screw 7 passing through the ball-pin.

The ribs 6 6 are wedge-shaped and can be brought nearer to each other by means of the screw 7 when they penetrate partially in two recesses 8 in the ball-pin, Fig. 8. These recesses also allow the forks 2 to inclose more than a half of a circle, so that a pull can be exercised on the joint, for when the joint is built up the forks are first put on at the recesses 8 and subsequently correspondingly turned so as to come over the full portion of the ball.

In the joint according to this invention all bearing-surfaces can therefore be adjusted by means of a single screw, the ribs 6 6, which are brought nearer to each other by the tightening of the said screw, being pressed strongly against the corresponding lateral surfaces of the forks of the joint, which are thus forced against the ribs 5 5.

In the construction shown in Figs. 1 to 13 the lateral surfaces of the forks 2 2 are turned conically and the ribs of the ball are correspondingly shaped, so that all lateral surfaces occupy radial positions relatively to the ball. Owing to this, on the one hand, the surface pressure is smaller and, on the other hand, the force required for tightening is considerably reduced, so that under the head of the set-screw 7 can be placed a spring insertion which insures constant tightening in the case of insignificant wear, so that the tightening of the screw is required much less frequently. These conical bearing-surfaces of the joint-forks enable the joint when tightened to transmit without play any longitudinal pull or push.

If as is desirable in many cases it is necessary to render possible longitudinal shifting, the lateral bearing-surfaces of the joint-forks or of one of the joint-forks are made flat instead of conical and the fork made with a half-circular recess with straight branches, as may be seen in Fig. 15, so that the portion of the spindle connected with the fork can slightly move in the longitudinal direction. The wedge action of the adjusting-ribs 6 6 remains, however, the same, as may be seen from Fig. 14, so that the adjustability of the joint is not affected.

It must be pointed out that the hole for the set-screw 7 in the ball-pin must be made slightly larger than the diameter of the screw in order to allow for lateral shifting of the screw, which takes place during the adjust-

ment. In many cases it may be desirable to provide the screw 7 with safety devices in order to prevent accidental loosening of the screw.

5 In Fig. 14 one of the ribs 5 is detachable and is secured to the ball-pin by means of a screw 10. By this way the joint is rendered more resistant against large torsional forces.

The details of the joint can be varied without departing from the spirit of our invention. Thus, for instance, the supporting-surfaces of the ball-pin instead of having the shape of a zone of a sphere can simply have a cylindrical surface, or all the four ribs of the ball-pin can be made separate and secured to the ball-pin by means of special screws.

What we claim is—

1. In a universal joint, the combination, with a movable element having bifurcated ends, of a ball-pin arranged to be embraced by the bifurcated ends and provided with ribs, and means for adjusting said ribs radially of the ball-pin.

2. In a universal joint, the combination, with spindles having bifurcated ends, of a ball-pin arranged to be embraced by the bifurcated ends and provided with ribs adjoining the lateral faces of the spindle ends, and means for adjusting the ribs radially of the ball-pin.

3. In a universal joint, the combination, with spindles having bifurcated ends, of a ball-pin arranged to be embraced by the bifurcated ends and provided with fixed and movable ribs adjoining the lateral faces of the ends, and means for adjusting two oppositely-disposed ribs radially of the ball-pin.

4. In a universal joint, the combination, with spindles having bifurcated ends, of a ball-pin arranged to be embraced by the bifurcated ends and provided with wedge-shaped ribs adjoining the lateral faces of the spindle ends, and means for adjusting said ribs radially of the ball-pin.

5. In a universal joint, the combination, with spindles having bifurcated ends, of a ball-pin arranged to be embraced by the bifurcated ends and provided with fixed and movable wedge-shaped ribs arranged in pairs on opposite sides of the pin, and means for adjusting the movable ribs radially of the ball-pin.

6. In a universal joint, the combination, with spindles having inwardly-curved bifurcated ends, of a ball-pin arranged to be embraced by the bifurcated ends and provided with ribs, two oppositely-disposed ribs being radially adjustable within recesses formed in the pin.

7. In a universal joint, the combination, with spindles having bifurcated ends with conical lateral faces, of a ball-pin arranged to be embraced by the bifurcated ends and provided with adjustable wedge-shaped ribs having conical faces adjoining the conical faces of the spindle ends, and means for adjusting said ribs radially of the ball-pin.

8. In a universal joint, the combination, with spindles having bifurcated ends, of a ball-pin arranged to be embraced by the bifurcated ends and provided with oppositely-disposed ribs adjustable radially in recesses formed in the ball-pin, a set-screw passing loosely through the ball-pin and connecting said ribs, said ball-pin also provided with an integral rib arranged at right angles to the adjustable ribs, and on the opposite side with a corresponding rib removably secured in fixed relation to the ball-pin, all of said ribs arranged to adjoin the lateral faces of the spindle ends.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

VLADIMIR LORENC.
VICTOR LORENC.

Witnesses:

EUGENE HARSAIN,
LOUIS VANDORY.