No. 631,385. Patented Aug. 22, 1899.

J. F. ROWLEY.

HINGE JOINT FOR ARTIFICIAL LIMBS.

(Application filed Dec. 23, 1898.)

(No Model.)

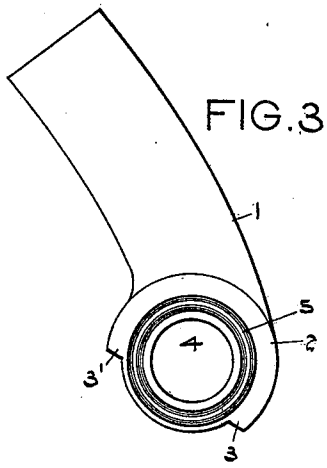

FIG. 3.

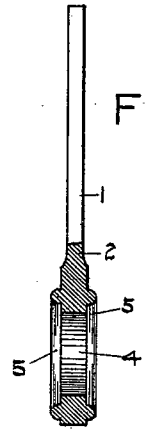

FIG. 2.

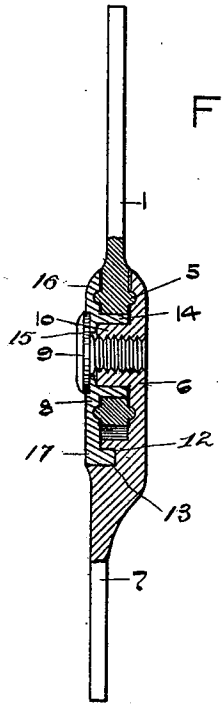

FIG. 1.

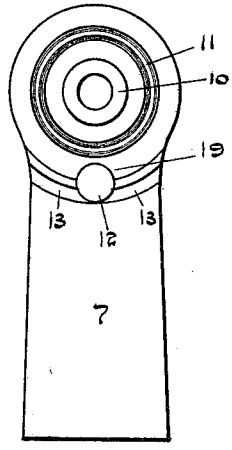

FIG. 5.

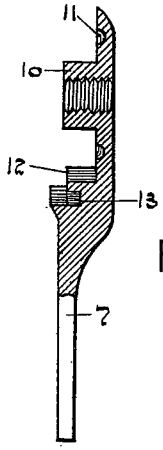

FIG. 4.

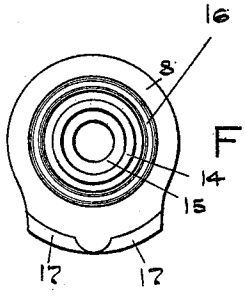

FIG. 7.

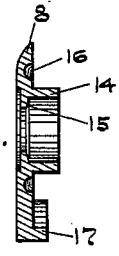

FIG. 6.

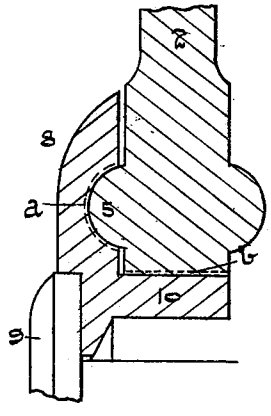

FIG. 8.

WITNESSES:

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UNITED STATES PATENT OFFICE.

JAMES F. ROWLEY, OF CHICAGO, ILLINOIS.

HINGE-JOINT FOR ARTIFICIAL LIMBS.

SPECIFICATION forming part of Letters Patent No. 631,385, dated August 22, 1899.

Application filed December 23, 1898. Serial No. 700,154. (No model.)

To all whom it may concern:

Be it known that I, JAMES F. ROWLEY, a citizen of the United States of America, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Hinge-Joints for Artificial Limbs, of which the following is a specification.

My invention, while relating to hinge-joints in general, is particularly applicable to knee-joints for artificial legs. Its objects are to facilitate the tightening or loosening of the joint, to provide for uniform readjustment compensating for wear, to provide for readily renewing the members subject to the greatest wear, and to provide an improved arrangement for cushioning the joint. I accomplish these objects by the construction illustrated in the accompanying drawings, in which—

Figure 1 is a vertical section through a joint constructed according to my invention. Fig. 2 is the same view of the female member removed from the other parts, and Fig. 3 is a side view of same. Fig. 4 is a section of the shank and rigid jaw of the male member, and Fig. 5 is a side view of same. Fig. 6 is a section of the movable jaw of the male member, and Fig. 7 is a side view of same. Fig. 8 is a detail sectional view illustrating in an exaggerated degree the effect of the ribs 5 in taking up wear.

The female member comprises a shank and body 2, the latter having shoulders 3 3′, a central orifice 4, and an annular rib or ridge 5, surrounding the orifice on each side of the body.

The male member of the joint consists of the rigid jaw 6, having the shank 7 thereon, the movable jaw 8, and the screw 9 for connecting said jaws. The jaw 6 has thereon the internally-threaded sleeve or raised part 10, surrounded by the annular groove 11, registering with the rib 5 on the male member. At the base of the jaw 6 is a lug 12 and a groove or depression 13 on each side of the lug. The movable jaw 8 has thereon a sleeve 14, adapted to fit the sleeve 10 and having at its base an internal flange 15. An annular groove 16 surrounds the sleeve or hollow pivot 14, registering with one of the ribs 5 on the female member. At the base of the jaw 8 are two ribs or projections 17, registering with the depressions 13 in the fixed jaw. The projections 17 and depressions 13 are rectangular in cross-section, providing for the adjustment of the movable jaw in direct line to and from the fixed jaw without relative pivotal movement. This is a feature of particular importance, since the pressure of the jaws upon the female member, particularly upon the ribs 5, can be regulated entirely by turning the screw 9. The sleeve 14 has a telescoping movement on the sleeve 10. The screw 9 is threaded in the sleeve 10 and has its head bearing against the outside of the movable jaw in the depression 18.

The female member is made to fit closely around the sleeve 14, being loose enough, however, to permit a free pivotal movement. The ribs 5 are made slightly deeper than the grooves 11, so as to provide for a slight clearance between the face of the jaw and the female member, except at the ribs. This permits a free pivotal movement of the female member and also provides for adjusting the movable jaw inwardly to take up the wear on the ribs or in the grooves 11.

The bearing-surface between the male and female members, as will be seen, is entirely at the sleeve 14 and ribs 5, thus providing for a minimum amount of friction.

When the parts are worn at the sleeve 14 or at the ribs 5, so as to interfere with the proper operation of the joint, either the movable jaw 8 or the female member can be replaced, thus again utilizing the greater part of the joint.

The lug 12 provides a convenient seat for padding or cushioning material to abut the shoulders 3 and 3′. This is indicated at 19 in Fig. 5. A thin piece of felt can be inserted and pressed into the position shown by turning the female member to each limit of its movement, so that the shoulders 3 and 3′ compress the felt against the lug 12.

I am aware that it is old to make one of the jaws of the male member of a joint movable to and from the other jaw for the purpose of adjusting the pressure upon the female member. I therefore do not claim such construction broadly. In the other joints of this class, however, no provision has been made for limiting the bearing-surface between the sides of the female member and the jaws of the

male member to an annular rib of sufficient depth to prevent contact of the overlapping surface adjacent the ribs so as to permit the inward adjustment of the jaws to compensate for wear on the ribs and their bearing-surface.

Another important improvement in my construction over those used heretofore is found in the telescoping sleeves 10 and 14 insuring a perfect adjustment of the jaws of the female member in a direct line toward each other upon the male member and providing for equal lateral pressure upon the entire bearing-surface of said members.

The arrangement of the lug 12 and the shoulders 3 and 3′, providing a stop between the jaws, I consider an improvement over the old form mainly in providing for properly cushioning the members of the joint at the limits of their pivotal movement.

The form of the ribs 5 in cross-section and of the corresponding grooves 11 and 16 is a feature of particular importance in preventing all relative longitudinal movement of the male and female members of the joint. The ribs increase in width toward their base, so that if the grooves are deepened and widened through wear, as indicated by the dotted line *a* in Fig. 8, and if the central bearing of the male member is worn, so as to loosen the same, making a clearance, as indicated by the dotted line *b* in Fig. 8, then the inward adjustment of the jaws of the male member will prevent the aforesaid relative longitudinal movement, since the wider part of the ribs toward their base will then be against the side of the grooves, toward the mouth of the grooves.

It will be understood that the details of the construction shown may be considerably varied without departing from the spirit of my invention. I therefore do not confine myself to such details, but claim any altered construction having substantially the same effect as that shown in accomplishing the objects of my invention.

What I claim as my invention, and desire to secure by Letters Patent, is—

A hinge-joint comprising a male member having a shank with a pair of jaws thereon adjustable toward and away from each other; the hollow pivot on one of said jaws; the internally-threaded extension slidingly fitting within said pivot; the annular bearing-ribs between said jaws and said female member, of sufficient depth to prevent all contact between said members, directly opposed to the inward adjustment of the jaws, except on said ribs; said jaws having slidingly interlocking members at their base, preventing their relative pivotal movement; and a screw threaded in said extension adjustably connecting said jaws.

Signed by me at Chicago, Illinois, this 19th day of December, 1898.

JAMES F. ROWLEY.

Witnesses:
WM. R. RUMMLER,
ALFRED MELTZER.