No. 676,081. Patented June 11, 1901.

J. F. ROWLEY.

HINGE JOINT FOR ARTIFICIAL LIMBS.

(Application filed Sept. 29, 1900.)

(No Model.)

Fig. 1.

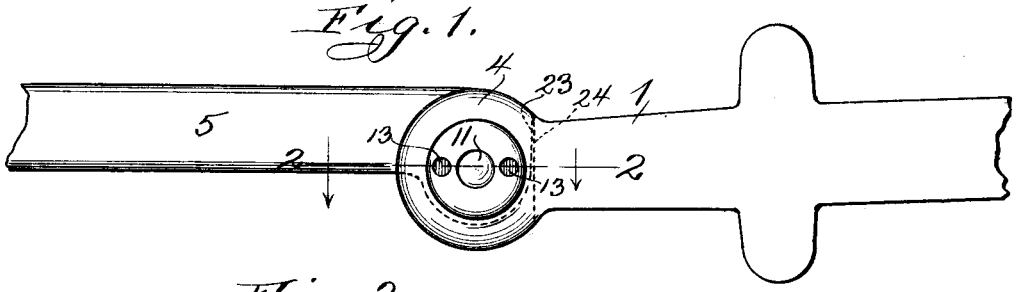


Fig. 2.

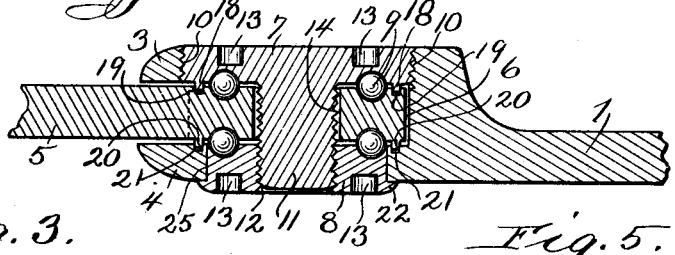


Fig. 3.

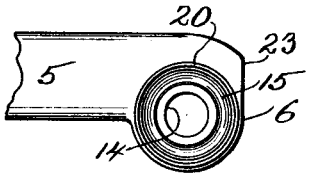


Fig. 4.

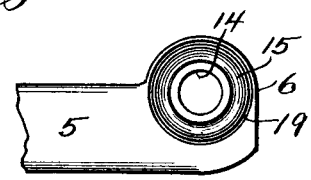


Fig. 5.

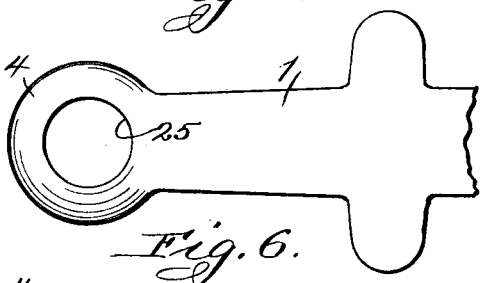


Fig. 6.

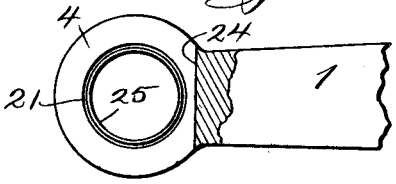


Fig. 7.

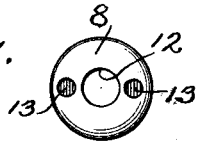


Fig. 8.

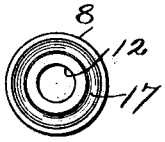


Fig. 9

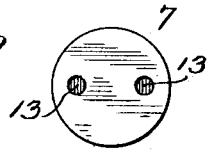
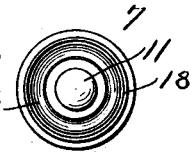


Fig. 10.



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By T. R. Runnicles
his Atty

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JAMES F. ROWLEY, OF CHICAGO, ILLINOIS.

HINGE-JOINT FOR ARTIFICIAL LIMBS.

SPECIFICATION forming part of Letters Patent No. 676,081, dated June 11, 1901.

Application filed September 29, 1900. Serial No. 31,478. (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 relates particularly to knee-joints on artificial legs for use in cases of amputation below the knee.

The main objects of my invention are to attain a minimum of friction, as well as strength and stability, in joints of this class, to facilitate the tightening or loosening of the joint, to prevent any unnecessary play or relative movement of the parts, and to provide a construction of joint which is substantially noiseless. I accomplish these objects with the construction illustrated in the accompanying drawings, in which—

Figure 1 is a plan of a hinge-joint constructed according to my invention. Fig. 2 is a section on the line 2 2 of Fig. 1. Fig. 3 is a plan of one of the members of the hinge, and Fig. 4 is an underneath view of the same member. Fig. 5 is a plan of one of the members of the hinge as shown in Fig. 1 with the other parts of the hinge removed from same. Fig. 6 is an underneath plan of the member shown in Fig. 5 and having one of the apertured ears broken away. Fig. 7 is an outside plan of the nut shown at the lower part of Fig. 2, and Fig. 8 is an inside plan of said nut. Fig. 9 is an outside plan of the plug shown at the upper part of Fig. 2, and Fig. 10 is an inside plan of same.

The form of hinge shown in the drawings consists, mainly, of a shank 1, having thereon overlapping apertured ears 3 and 4, the shank 5 having the apertured part 6 seated between said ears, the plug 7, nut or plug 8, and the balls 9. The ear 3 has the threaded aperture 10 therein for receiving the threaded base of the plug 7. Said plug has a central threaded pin 11. The nut 8 has a central threaded aperture 12, fitting upon the free end of the pin 11. The plug 7 and nut 8 are each provided on their outer surfaces with a pair of recesses or depressions 13, adapted to receive a wrench for turning either said plug or nut. The pin 11 passes through the aperture 14 in the part 6. The ball-race 15 surrounds the aperture 14 on each side of the part 6. The plug 7 is provided with a ball-race 16, surrounding the pin 11. The nut 8 is provided with a ball-race 17, surrounding the aperture 12. The plug 7 has an annular ridge 18, surrounding the ball-race 16 and fitting in an annular groove 19, which surrounds the ball-race on one side of the part 6. The opposite side of the part 6 has an annular ridge 20, fitting in the annular groove 21 in the ear 4. The nut 8 has a head or extended part 22, which bears against the outside of the ear 4.

The aperture 14 in the part 6 is made of suitable size to prevent contact of said part with the pin 11. The space between the ears 3 and 4 is made of suitable width to prevent contact between said ears and the part 6 except at the ridge 20. The part 6 also has contact with the ridge 18, but is otherwise free from the other parts of the joint except the balls 9. The part 6 has the shoulder 23 for abutting against the shoulder 24 between and at the base of the ears 3 and 4. The aperture 25 in the ear 4 is not threaded and permits the free rotation of the nut 8 therein until said nut has its head 22 drawn tightly against the outside of the ear 4.

The operation of my device is as follows: The part 6 is first inserted between the ears 3 and 4 in the position shown in Fig. 2. The balls 9 will then be dropped into the race 15, and the plug 7 will be screwed into the threaded aperture 10. The device will then be turned with the other side upward, and balls 9 will be dropped into the race 15 on the opposite side of the part 6. The nut 8 will then be screwed upon the pin 11 until its head 22 bears against the outside of the ear 4. In case the pressure against the balls is greater than is desired to give suitable relative pivotal movement to the shanks 1 and 5 the plug 7 may be screwed upwardly in the ear 3. It will be seen that the same result may be accomplished by screwing the nut 8 downwardly on the pin 11. I prefer to have the head 22 of the nut 8 bear tightly against the outside of the arm 4 and will therefore usually adjust the pressure on the balls 9 by turning the plug 7. The object of the ridges 18 and 20 is to make the bearing of the joint sub-

stantially dust-proof. The shoulder 23 abuts against the shoulder 24 when the parts are in the position shown in Fig. 1.

It will be understood that the details of construction of the device shown may be altered in various ways without departing from the spirit of my invention. I therefore do not confine myself to such details except as hereinafter limited in the claims.

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

1. A hinge-joint comprising a member having a shank with a pair of overlapping apertured ears, a second member having a shank with an apertured part seated between said ears, a plug seated in the aperture in one of said ears and having a threaded pin extending into the aperture in said second member, a second plug in the aperture in the other ear and having a central aperture threaded upon the free end of said pin, means for fixing the position of said plugs in said ears to prevent same from shifting toward and from said second member, and a series of balls on each face of said second member and bearing against said plugs, substantially as described.

2. A hinge-joint comprising a member having a shank with a pair of overlapping apertured ears, a second member having a shank with an apertured part seated between said ears, a plug seated in the aperture in one of said ears and having a threaded pin extending into the aperture in said second member, a second plug in the aperture in the other ear and having a central aperture threaded upon the free end of said pin, one of said plugs being threaded into the aperture in its respective ear, and the other plug being revoluble in its respective ear and having a head bearing against the outside of said ear, and a series of balls on each face of said second member and bearing against said plugs, substantially as described.

3. A hinge-joint comprising a member having a shank with a pair of overlapping apertured ears, the aperture through one of said ears being threaded, a second member having a shank with an apertured part seated between said ears and having a ball-race surrounding its aperture on each side, a threaded plug seated in said threaded aperture and having a central threaded pin extending into the aperture in said second member, a second plug having a central aperture threaded upon the free end of said pin, and a series of balls in each of said races bearing respectively against the inner faces of said plugs, substantially as described.

4. A hinge-joint comprising a member having a shank with a pair of overlapping ears, one of said ears having a threaded aperture through same and the opposite ear having an unthreaded circular aperture through same, a second member having a shank with an apertured part seated between said ears and having a ball-race surrounding its aperture on each side, a threaded plug seated in said threaded aperture and having a central threaded pin extending into the aperture in said second member, a second plug revoluble in said unthreaded aperture and having a central aperture threaded upon the free end of said pin and having a head bearing against the outside of the ear in which said second plug is seated, each of said plugs having a ball-race on its inner face, an annular ridge surrounding each of said races, the part opposed to each of said ridges having an annular groove for receiving its respective ridge, and a series of balls in each of said races and adapted to prevent contact of said second member with said threaded pin, substantially as described.

Signed at Chicago this 26th day of September, 1900.

JAMES F. ROWLEY.

Witnesses:
WM. R. RUMMLER,
E. C. MOORE.