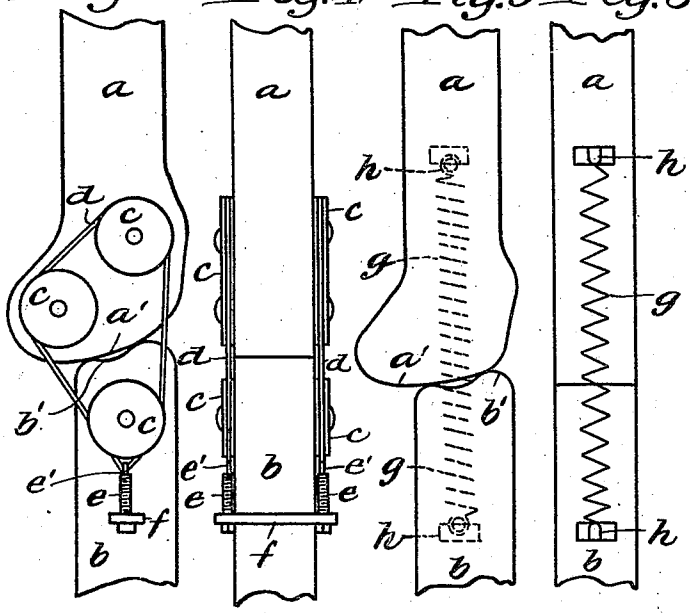
A. HABERMANN.

ARTIFICIAL KNEE JOINT.

APPLICATION FILED FEB. 5, 1921.

1,421,216. Patented June 27, 1922.

Fig. 3. Fig. 4 Fig. 5 Fig. 6



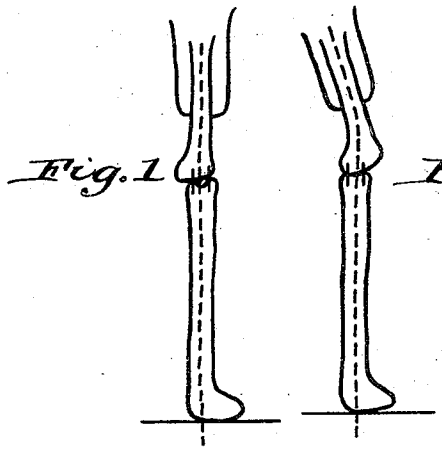


Fig. 1 Fig. 2.

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UNITED STATES PATENT OFFICE.

ALFRED HABERMANN, OF MUNICH, GERMANY.

ARTIFICIAL KNEE JOINT.

1,421,216. Specification of Letters Patent. **Patented June 27, 1922.**

Application filed February 5, 1921. Serial No. 442,875.

To all whom it may concern:

Be it known that I, ALFRED HABERMANN, citizen of Germany, residing at Munich, Bavaria, Germany, have invented certain new and useful Improvements in Artificial Knee 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 an improvement in the construction of a knee-joint, as used in artificial legs and its object is to provide for a construction offering certain advantages, as hereinafter more particularly set forth.

In describing my invention I refer to the drawing in which Fig. 1 diagrammatically illustrates the knee joint extended; Fig. 2 diagrammatically illustrates the joint in bent position; Fig. 3 is a side elevational view of a form of artificial joint in which the members are held together by means of endless bands; Fig. 4 is a rear elevational view of a slightly modified form of the structure of Fig. 3; Fig. 5 is a side elevational view of a form of the artificial joint in which the members are held together by means of a spring, and Fig. 6 is a rear elevational view of a slightly modified form of the structure of Fig. 5.

My novel knee-joint differs from joints used heretofore in that it does not contain a hinge-joint, but a sliding-joint, the ends of the thigh and shank frictionally contacting with each other and having slip-joint-faces corresponding with those of the natural knee. When the knee is bent the surfaces partly slide one upon the other and partly move away from each other, as in the natural knee action.

This construction offers the advantages, first, that instead of presenting but a small supporting-surface, as for example in an ordinary shaft bearing, a considerably large supporting-face is obtained and, second, in bending the knee this supporting-face travels backward and thus the person using the device attains a better sure-footedness.

In Fig. 1 the knee joint is extended, while in Fig. 2 it is bent, these views corresponding respectively to the positions assumed by the parts of the natural leg. In the forms of invention shown in Figs. 3 and 4, a and b are the upper and lower parts of the leg, respectively, having the frictionally contacting surfaces a' and b' shaped to exactly simulate the corresponding surfaces of the human knee joint. Carried by the members a and b are rollers c over which passes an endless band or cord d, which serves to hold the surfaces a' and b' or parts thereof in frictional engagement. The tension of the band d may be adjusted by a threaded stud e, having a hook or an eye e' engaging the band, and secured in position by a bar f carried by one of the joint members, for example, the member b. The only difference between Figs. 3 and 4 is that in Fig. 3 the bar f passes through the member b while in Fig. 4 it is secured on the outside thereof.

In the forms of Figs. 5 and 6 the members a and b are held in engagement by a suitable spring g having its opposite ends secured at h in the upper and lower joint members, respectively. In Fig. 5 the spring g is within the members a and b while in Fig. 6 it is on the outside thereof.

It will be noted that in all forms of the invention the opposed surfaces a' and b' are shaped like the corresponding surfaces of the human knee joint and that these surfaces, or parts thereof, are held in frictional sliding engagement by flexible means.

I claim:—

1. An artificial knee joint, comprising upper and lower leg members having complemental abutting end surfaces, and means for holding said surfaces in frictional sliding engagement.

2. An artificial knee joint, comprising upper and lower leg members having complemental end surfaces curved in conformity with the corresponding surfaces of the human knee joint, and flexible means for holding said surfaces in frictional sliding engagement.

3. An artificial knee joint, comprising upper and lower leg members having complemental end surfaces curved in conformity with the corresponding surfaces of the

human knee joint, guides carried by said members, and a band passing over said guides.

4. In an artificial knee joint, the combination with the elements claimed in claim 3, of means for regulating the tension of the band.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

ALFRED HABERMANN.

Witnesses:
PAUL DREZ,
A. DE OLEA.