J. DAWES.

ARTIFICIAL LEG.

No. 187,603. Patented Feb. 20, 1877.

Fig. 1.

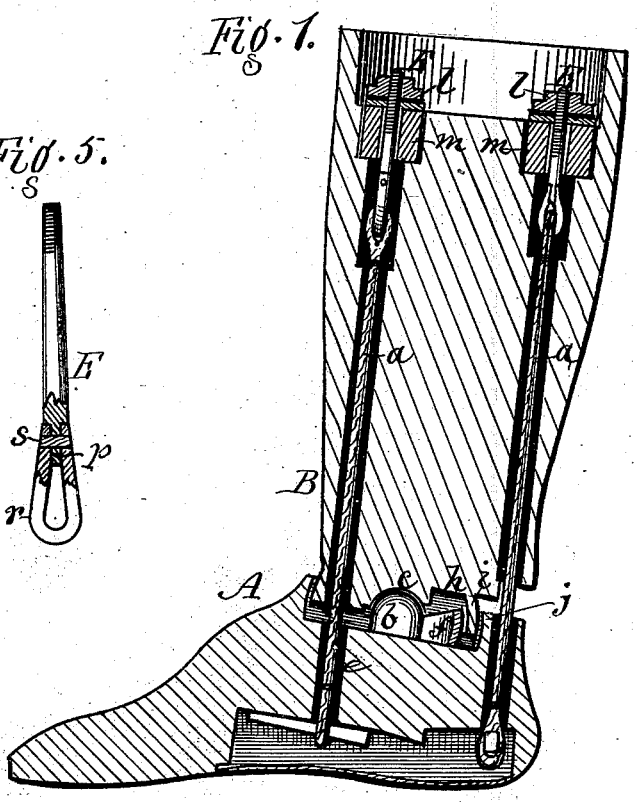


Fig. 5.

Fig. 2.

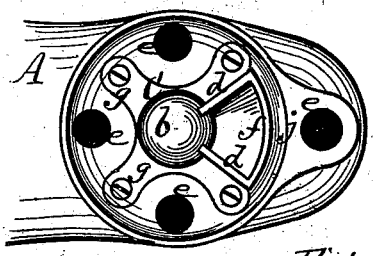


Fig. 3.

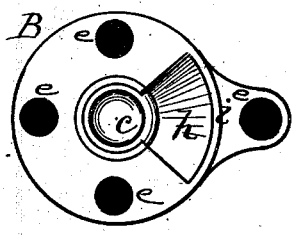
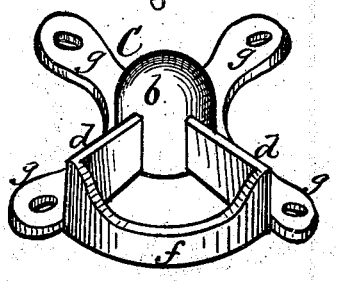


Fig. 4.



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JOSEPH DAWES, OF ROCHESTER, NEW YORK.

IMPROVEMENT IN ARTIFICIAL LEGS.

Specification forming part of Letters Patent No. **187,603**, dated February 20, 1877; application filed January 22, 1877.

To all whom it may concern:

Be it known that I, JOSEPH DAWES, of the city of Rochester, in the county of Monroe and State of New York, have invented a certain new and useful Improvement in Artificial Legs; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a central vertical section of an artificial leg, showing my improvement. Fig. 2 is a plan view of the foot portion. Fig. 3 is a similar view of the bottom of the ankle portion. Fig. 4 is a perspective view of the ball-and-socket bearing. Fig. 5 is an elevation of the bolt for attaching one of the cords.

My improvement relates to that class of artificial legs in which a ball-and-socket joint is used at the ankle to allow a universal motion.

The invention consists of a bearing of peculiar construction attached to the foot portion, whereby the ankle is properly guided and retained in place against lateral action. It also consists of a bolt, of peculiar construction, for attaching the cords that connect the foot with the ankle, as hereinafter more fully described and definitely claimed.

A represents the foot, and B the ankle. These parts are connected by the usual cords *a a a a*, four in number; and the ankle-joint consists of the ball *b* and socket *c*, which allow a universal motion. C is a metallic bearing, which is attached in the socket at the top of the foot. The ball *b* forms a part of it. It is also constructed with two angular wings, *d d*, on the back side, radiating from the center; and at the extremities these wings are connected by a segmental rim, *f*, which, in cross-section, is concentric with the center of the joint on which the ankle turns. The segment occupies one-fourth, more or less, of the circle. The screws that attach the bearing to the foot pass through lugs *g g*, radiating from the center. Space is left thereby for the holes *e e e e*, through which the cords pass.

The bottom of the ankle portion is provided with a shallow socket, *c*, which fits upon the ball. It is also formed with a segmental depression or cavity, *h*, of a size and depth to fit closely, but loosely, over the segment formed by the wings *d d* and rim *f* of the bearing C. Outside the cavity *h* the rim *i* of the ankle forms a thin flange, which rides between the rim *f* and the shoulder *j* of the ankle portion, as shown at the rear in Fig. 1.

The essential feature in this part of my invention is the segment, consisting of the wings *d d* and the rim *f*, forming a bearing to the ankle, to keep it in place against any twisting or turning movement, yet allowing it free articulation both longitudinally and laterally. It has such free articulation by resting on the ball, and is kept against twisting or turning by the fitting of the cavity or depression *h* over the segment, and embracing it on every side.

The great difficulty with ordinary universal joints is, that they are not properly stayed, and, as a consequence, they are troublesome and inconvenient in use, are liable to looseness and rattling, are not firm to the step of the wearer, and, moreover, produce great strain upon the cords. My invention obviates these difficulties.

I am aware that in legs having ball-and-socket joints a projection, forming a part of the wooden socket, has been employed on the rear side of the joint, fitting in a corresponding slot of the leg portion; but in such case difficulty is experienced from the breaking of the projection, caused by the strain which comes thereon by the twisting of the leg in action; also, from the catching and riding of the bottom of the leg portion thereon, caused by the yielding or relaxation of the rear cord under constant strain.

In my device the bearing, being cast solid with the ball, cannot be broken nor easily worn out; and, furthermore, a special advantage results from its being carried around so far forward, as it preserves its connection with the cavity *h* at all points of the flexion, so that no danger can arise from the riding of the leg portion over said bearing.

The cords *a a a a* each consist of an endless length of linen threads, wound over and over, and covered with buckskin or other suitable covering, with loops at the ends. These loops enter eyebolts E E, which are threaded at the

upper end, and secured by nuts *l l* on top of rubber springs *m m*, which allow the necessary elasticity.

In order to insert the closed loops of the cords, eyebolts of peculiar construction must be used, that will allow the eyes to open. I construct the eyebolts as shown in Fig. 5. The lower end of the bolt proper is formed with a shouldered shank, *p*. The loop *r* is bent double, and the open ends fitted against the shank, so as to present a flush outer surface. The cord having been entered into the loop, the ends of the latter are fitted to the shank, and the two parts are then fastened permanently together by a rivet, *s*. This makes the eyebolt as solid as if formed in one solid piece, while the cord may be removed for repairs or otherwise by simply driving out the rivet. It enables the loop to be entered, which could not be done if made solid.

I design to make the ball *b* of glass, and to cast it into the iron bearing C by placing said ball in the mold before the metal is poured.

Having thus described my invention, I do not claim, broadly, in an artificial leg, a guide or bearing to prevent twisting of the leg; but

I claim—

1. In an artificial leg, the metallic bearing C, constructed with the wings *d d* and rim *f*, forming a segment one-fourth, more or less, of the circle, in combination with a corresponding cavity, *h*, of the ankle fitting over it, the said segment being carried forward, to prevent disengagement of the cavity therefrom at the extreme forward bend of the leg, as herein shown and described, and for the purpose specified.

2. In an artificial leg, the eyebolt E, consisting of a threaded screw, provided with a shouldered shank, *p*, at its lower end, and the loop *r*, having open ends fitting said shank, the parts being secured together by the rivet *s*, as shown and described, and for the purpose specified.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JOSEPH DAWES.

Witnesses:
R. F. OSGOOD,
CHAUNCEY NASH.