No. 619,731. Patented Feb. 21, 1899.

# C. H. DOERFLINGER, J. BURG & J. DAVIS.

## ARTIFICIAL ANKLE JOINT.

(Application filed Mar. 10, 1898.)

(No Model.)

Fig. 1.

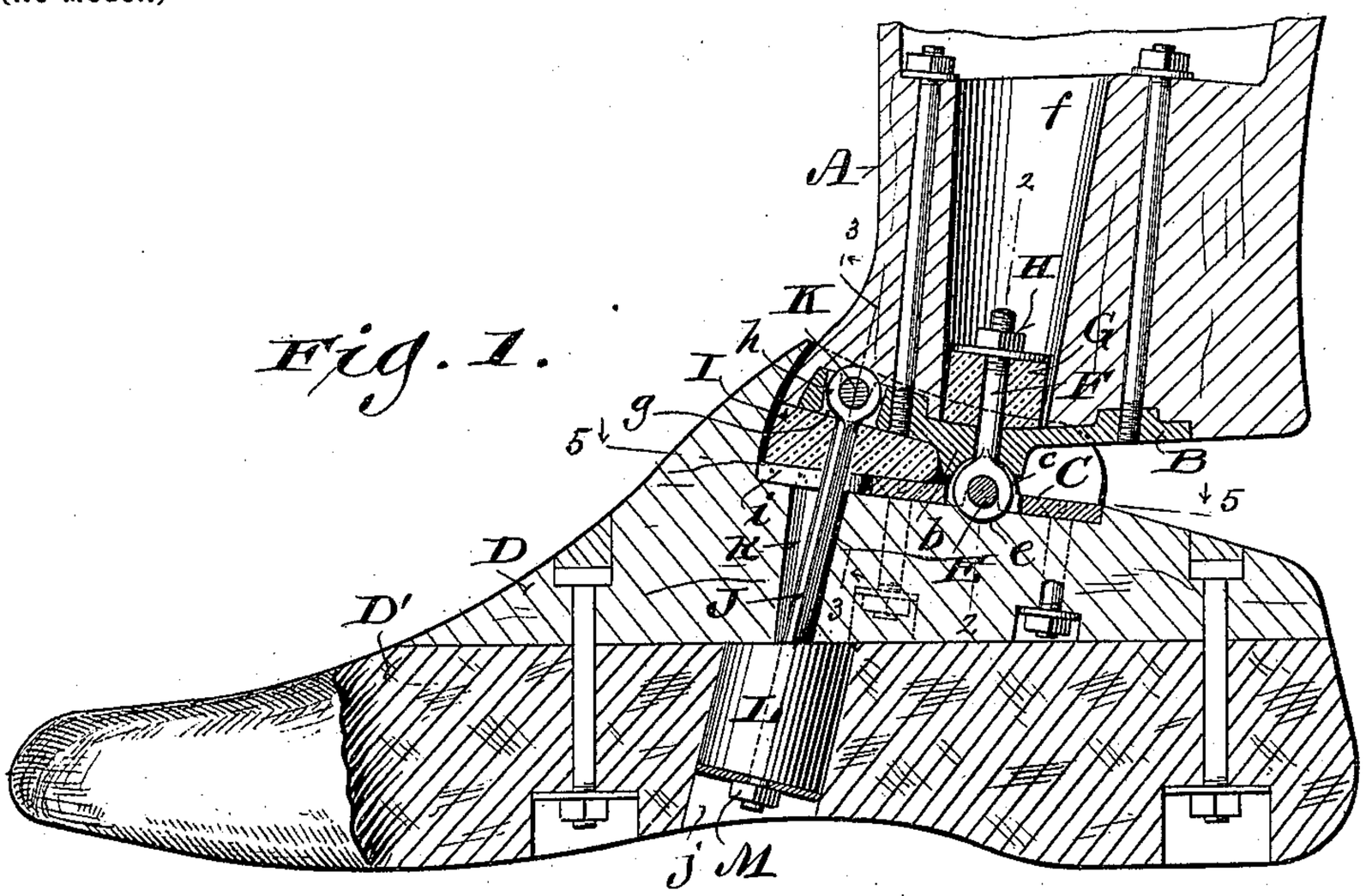



Fig. 2.

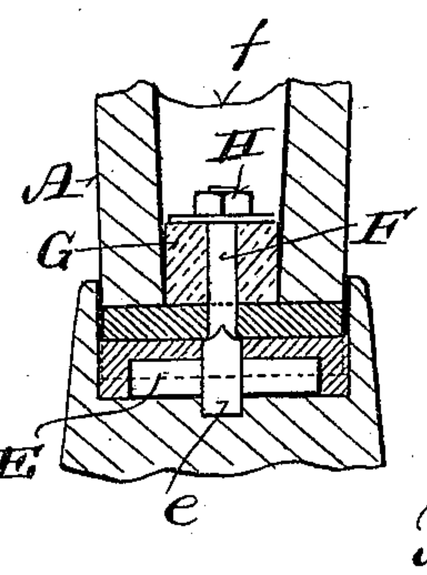



Fig. 3.

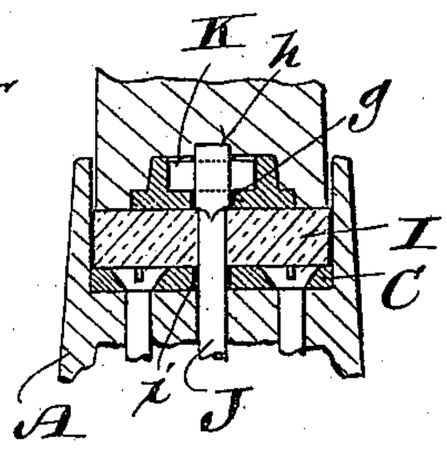



Fig. 4.

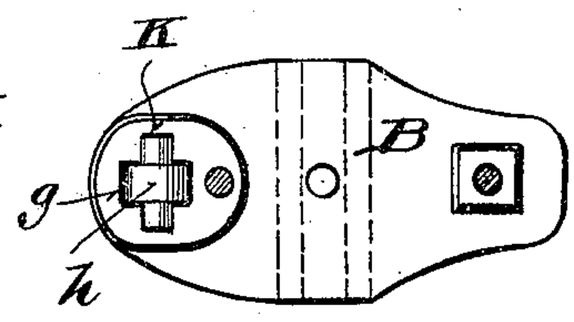
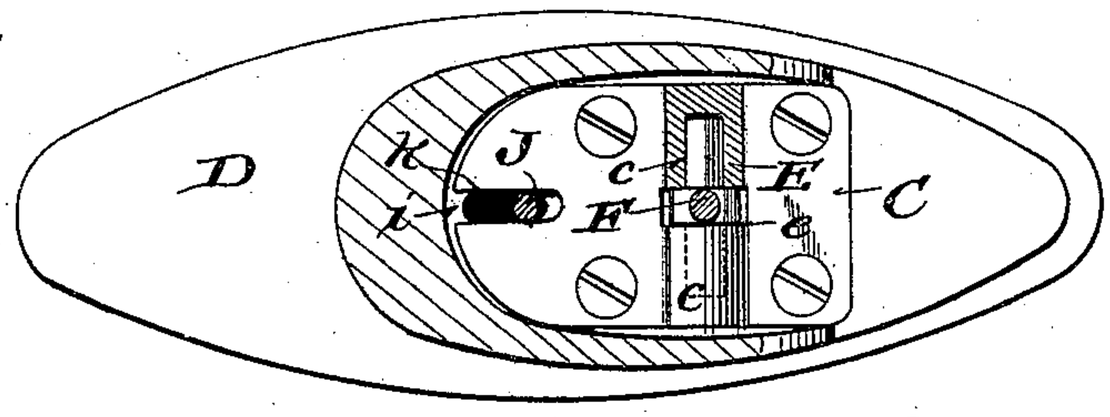



Fig. 5.

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# UNITED STATES PATENT OFFICE.

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## ARTIFICIAL ANKLE-JOINT.

SPECIFICATION forming part of Letters Patent No. 619,731, dated February 21, 1899.

Application filed March 10, 1898. Serial No. 673,329. (No model.)

*To all whom it may concern:*

Be it known that we, CHARLES H. DOERFLINGER, JOSEPH BURG, and JOSEPH DAVIS, citizens of the United States, and residents of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Artificial Ankle-Joints; and we do hereby declare that the following is a full, clear, and exact description thereof.

Our invention has for its object to provide artificial limbs with simple, economical, and noiseless ankle-joints; and it consists in certain peculiarities of construction and combinations of parts hereinafter set forth with reference to the accompanying drawings and subsequently claimed, whereby we avoid the use of heel and toe cords, equalize strain, afford provision for regulation of tension, and insure an easy action under all the various conditions to which such joints are subjected.

Figure 1 of the drawings represents a longitudinal section view of leg and foot portions of an artificial limb provided with an ankle-joint in accordance with our invention; Figs. 2 and 3, detail transverse sections respectively indicated by lines 2 2 and 3 3 in the first-described figure; Fig. 4, a detail plan view of an upper plate and connections embodied in the joint; and Fig. 5, a similar view, partly in section, as indicated by line 5 5 in said first-described figure.

Referring by letter to the drawings, A represents the ankle end of an artificial leg, and mortised in the same to be flush with its under portion is a plate B, bolted or otherwise rigidly secured in place. The plate B is herein shown as having its central portion provided with a depending concave rib *b*, arranged transversely thereof and engaged by convex lugs *c*, rising from another plate C, bolted or otherwise rigidly secured to the upper portion D of an artificial foot. The plate B is shown as having upward inclination in opposite directions from its depending concave rib *b*, and although the plate C is flat its disposition in practice is at an angle to the longitudinal plane of the foot to which it is secured. The lower portion D′ of the foot is preferably felt or some other suitable yielding material rigidly secured to the part D, the latter being usually wood.

The lugs *c* on plate C are on opposite sides of a longitudinal slot *d* in said plate, and the latter is provided with concave under side recesses engaged by a pin E, loose in an eye end *e* of a bolt F, extending up through said slot and an aperture in the plate B aforesaid.

Within a hollow portion *f* of leg A the bolt F is surrounded by a rubber block G or other suitable spring, the tension of the latter being regulated by adjustment of a nut H run on the free end of said bolt against a spring-opposing washer.

A rubber block I or other elastic cushion is interposed between the forward ends of the plates B C, and a central longitudinal slot *g* in the former plate is shown engaged by the eye end *h* of a bolt J, that extends down through a similar slot *i* in the other plate. A pin K, loose in the eye end of bolt J, has bearing in concave upper side recesses of plate B, and within a recess *j* of the foot said bolt is surrounded by a rubber block L or other suitable spring, the tension of this spring being regulated by adjustment of a nut M run on the free end of said bolt against a spring-opposing washer.

That portion D of the foot through which bolt J passes has bore *k* of sufficient area to prevent cramp of said bolt, and the construction and arrangement of parts necessary to the rocking action of plate B on plate C may be more or less varied from what is herein shown without departure from our invention, it being possible to obtain said rocking action in a number of ways.

The ankle-joint herein set forth is just as applicable to an artificial limb organized for a person who has suffered amputation above the knee as it is for one who has been amputated below the knee, and from the general construction and arrangement of parts shown and described it will be apparent that the weight of a person provided with an artificial limb embodying said joint is alternately resisted by the spring L and cushion I, the normal compression of said spring and the one

G being obtained by adjustment of nuts M H to regulate the tension of the aforesaid joint.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

An artificial ankle-joint comprising a pair of plates one of which has rocker-bearing with respect to the other, a bolt in yielding connection with one of the plates and extended through the other plate, a spring surrounding the bolt against the latter plate, a nut on said bolt in position to regulate tension of the spring, an elastic cushion between forward ends of said plates, another bolt having yielding connection with the forward end of the upper plate and engaged with a longitudinal slot in the lower plate, a spring surrounding the lower portion of the latter bolt, and a nut on said latter bolt in position to regulate tension of the latter spring against an opposing surface.

In testimony that we claim the foregoing we have hereunto set our hands, at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

CHARLES H. DOERFLINGER.
JOSEPH BURG.
JOSEPH DAVIS.

Witnesses:
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