T. Burr,

Artificial Leg.

No. 47,353. Patented Apr. 18, 1865.

Fig: 1.

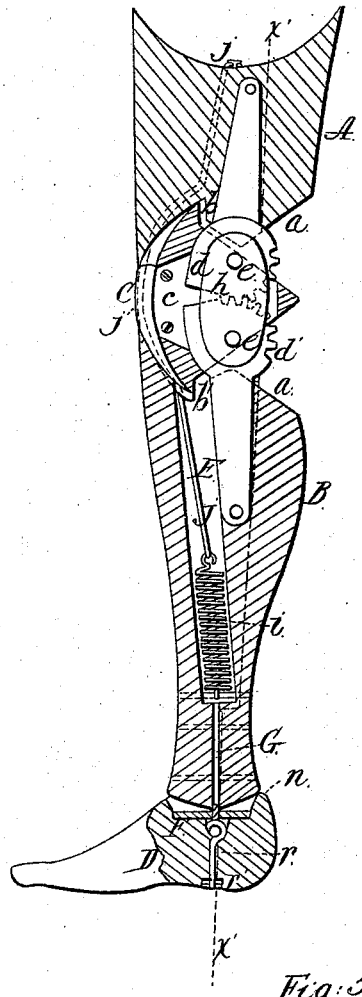


Fig: 4.

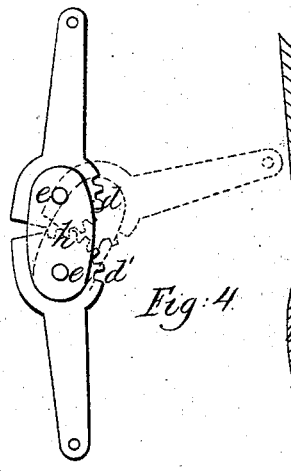


Fig: 3.

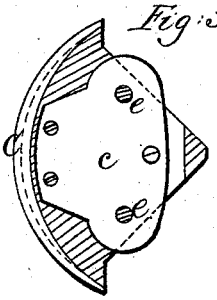


Fig: 5.

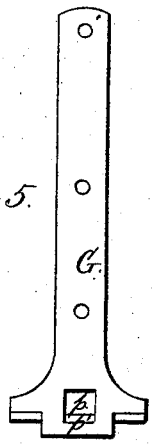


Fig: 2.

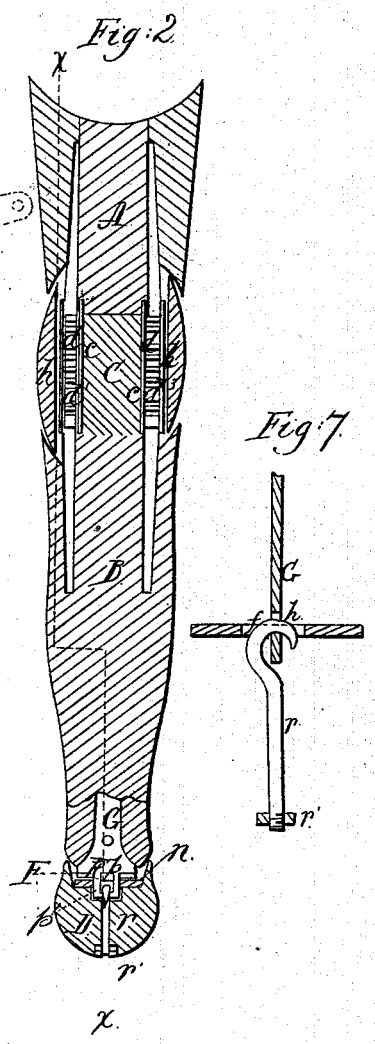
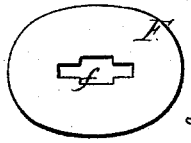


Fig: 7.

Fig: 6.



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UNITED STATES PATENT OFFICE.

THEODORE BURR, OF BATTLE CREEK, MICHIGAN, ASSIGNOR TO HIMSELF AND SMITH M. KELLOGG.

IMPROVEMENT IN ARTIFICIAL LEGS.

Specification forming part of Letters Patent No. **47,353**, dated April 18, 1865.

To all whom it may concern:

Be it known that I, THEODORE BURR, of Battle Creek, county of Calhoun, State of Michigan, have invented a new and Improved Artificial Leg; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a section taken through my artificial leg in the plane indicated by the red line *x x*, in Fig. 2. Fig. 2 is a section taken in the vertical plane indicated by red line *x' x'*. Fig. 3 is a sectional view of the knee segment. Fig. 4 is a view in detail of the toggle-joints used to form the knee-joint of the leg. Figs. 5, 6, 7 are detailed views showing those parts which constitute the ankle-joint.

Similar letters of reference indicate corresponding parts in the several figures.

The object of this invention is to obtain the desired motions of a leg at the joints of the knee and ankle, and at the same time to so construct these joints that while they will work easy and possess very great strength, there will be very little friction or injurious wear attending the use of the leg, as will be hereinafter described.

To enable others skilled in the art to make and use my invention, I will describe its construction and operation.

In the accompanying drawings, A represents the upper portion of the artificial leg; B, the lower portion thereof; C, a segment which is interposed between the two portions A B, and D is the foot, all of which parts I propose to make of rawhide, or some other other suitable material possessing strength and lightness.

I make each one of the three portions A B C of the leg of three longitudinal sections, which are suitably secured together, when those parts constituting the knee-joint are fixed in place. The intermediate flat-sided sections are those to which I shall particularly refer, as these sections applied to the sides of these are merely intended to give the desired rotundity to the leg.

The segment C is fitted into recesses formed in the ends of the upper and lower intermediate sections of the leg, so that the leg can easily bend at the knee without destroying the continuity of the parts at this point, and in order to admit of this bending, the segment C is tapered to an acute angle, as shown in Figs. 1 and 3, and the ends of the sections A B are beveled at *a a*. The sockets, which are formed in the ends of the upper and lower portions of the leg to receive the segment C are terminated in abrupt shoulders at *b b*, which are abutting points for the segment to prevent the leg from bending backward too far at the knee-joint. To the flat sides of segment C, metallic plates *c c* are rigidly secured, and to these plates are pivoted at *e e e e* four toothed segments, *d d' d² d³*, two on each side of the segment C. These toothed segments are formed on the ends of narrow plates, which are rigidly secured to their respective portions A B, so that the teeth of said segments will interlock with each other when the leg is bent at the knee. The pivots *e e* of both pair of segments being connected to the segment C, they keep this latter in place in its sockets, and make it serve as the knee-cap. It is not intended that this segment C shall work in contact with the ends of the upper and lower portions of the leg, but that the weight put upon the leg shall be sustained at the knee by the pivot-joints *e e e e*, which connect the segments together. I therefore employ, in addition to the inside plates, *c c*, two outside plates, *h h*, which, being pivoted to said segments, serve to strengthen the parts at these points, and sustain them against injury from lateral strain.

A long opening, E, is made in the intermediate section of the lower portion of the leg in a direction with the length of this section, and in this slot is inserted a spring, *i*, one end (lower end) of which is attached to the portion B, and the other end to a strong catgut string, *j*, which passes around the forward portion of the segment C and through the upper leg, A, to which latter it is secured in the cupled depression in the upper end of this portion, as shown in Fig. 1. This string *j* is drawn tight, and fastened when the leg is straight, and the spring is sufficiently strong to keep the leg in this position and prevent it from swinging unnaturally in the act of walking. In applying and adjusting the spring *i* to the lower leg, the weight of this portion and the strength of the spring should

be calculated, in order to allow of a free and easy movement of the leg corresponding to that of the natural leg in walking, for should the spring be too strong the leg will not bend at the knee, and remain in a bending position while sitting, or should the spring be too weak, the lower leg will accommodate itself to the movements of a person with sufficient certainty or precision.

The ankle-joint is constructed in the following manner: The lowermost end of the portion B is beveled, as represented in Fig. 1, and fitted loosely within the depression or socket *n* in the ankle-portion of the foot D, so as to allow the foot to play backward and forward. A plate, F, Figs. 6 and 7, which has a transverse slot, *f*, through it, is fitted within the socket in the foot D, and intended to serve as a bearing for the knife-edged wings of a strap, G, Figs. 5 and 7. This strap G has an eye, *p*, through it, the lower edge, *p'*, of which is beveled, so as to form a knife-edge. The strap G is secured centrally within the lower leg, B, as shown in Figs. 1 and 2, and its lower slotted end projects therefrom a sufficient distance to allow its slotted tongue *p'* to pass through the eye in plate F and receive the hook on the end of the screw-stem *r*, as shown in Figs. 1 and 7. This hooked stem *r* passes through the foot, and receives on its lower end a nut, *r'*, by means of which the foot is drawn up to its place and the knife-edge bearings properly held together. By removing the nut *r'* the foot can be detached from the leg.

It will be seen from this description that the joint connecting the foot to the leg will admit of a free articulation, and that there will be very little, if any, friction in this form of joint.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is— .

1. The segment C, constructed with the plates *c c*, and otherwise substantially as described, for the purpose set forth.

2. The combination of the parts F G *r*, constructed and applied so as to form a knife-edge joint, substantially as described.

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