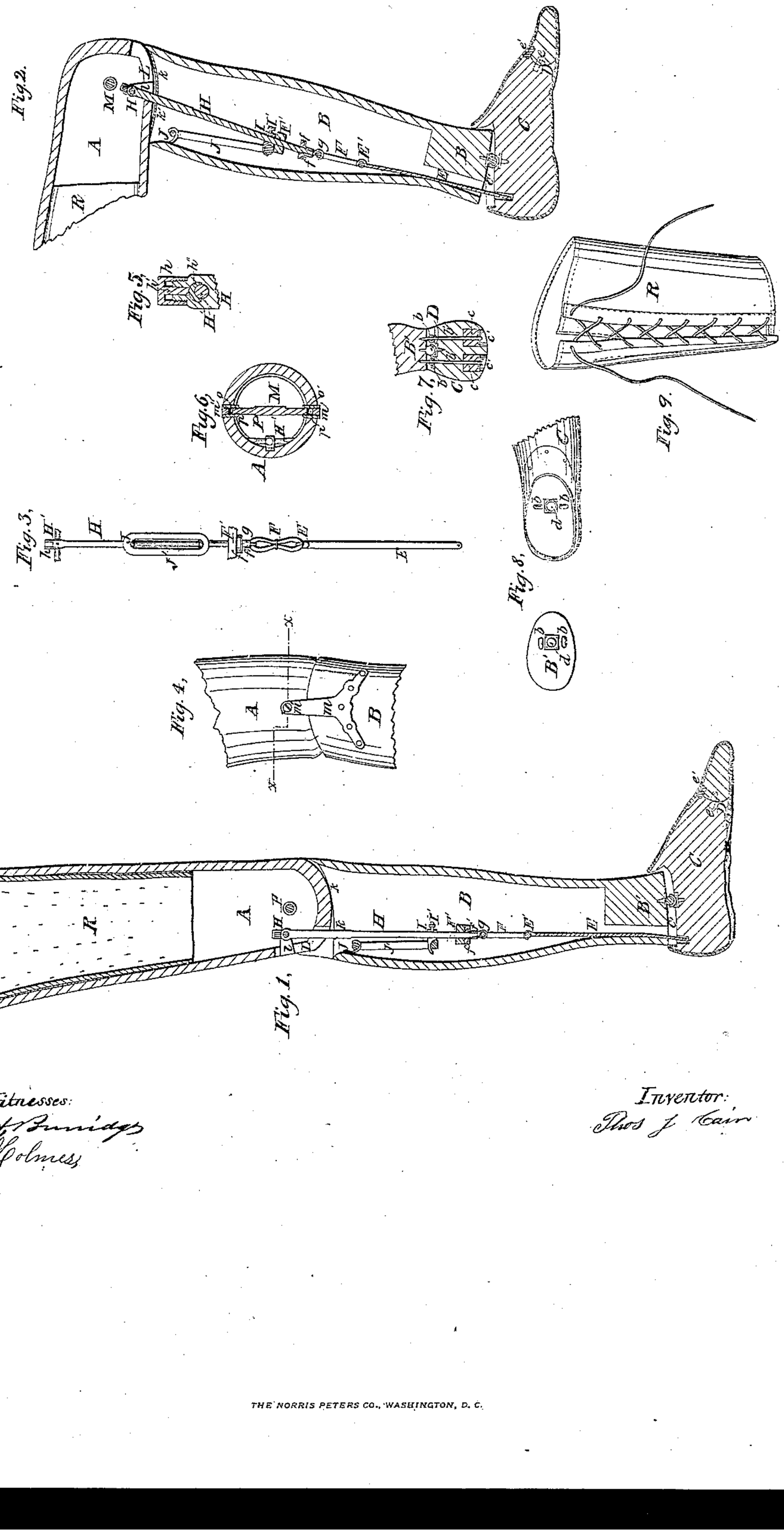
T. J. CAIN.

ARTIFICIAL LEG.

No. 44,766. Patented Oct. 18, 1864.



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THOMAS JAMES CAIN, OF CLEVELAND, OHIO, ASSIGNOR TO HIMSELF ANL WILLIAM G. AND J. LAWRENCE, OF SAME PLACE.

IMPROVEMENT IN ARTIFICIAL LEGS.

Specification forming part of Letters Patent No. **44,766**, dated October 18, 1864.

To all whom it may concern:

Be it known that I, T. J. CAIN, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Artificial Legs; and I do hereby declare that the following is a full and complete description of the construction and operation of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a vertical section. Fig. 2 is a vertical section of the leg in a different position from that in Fig. 1. Figs. 3, 4, 5, 6, 7, 8, and 9 are sections which will be referred to in the description.

Like letters of reference refer to like parts in the several views.

My improvement relates to making an artificial leg in such a manner that all the parts can be moved as may be desired with the greatest ease and facility for the wearer, and they can also be readily adjusted and kept in good order.

A represents the upper part or thigh of the leg; B, the lower part, and C the foot. At the ankle-joint, where the foot is connected to the leg, there is a ball-and-socket joint, D, the ball *d* being secured to the under side of the ankle B′ of the leg, and the socket *d′* to the foot, as represented in Fig. 8. This joint is kept in place, as it is operated, by a hook and eye, *b*, on each side, (shown in Figs. 7 and 8,) linked or hooked together, as represented in Fig. 7. The pieces *b′*, forming the lower links or hooks, extend down into the foot through the elastic springs *c*, and are fastened to the pieces *c′* underneath the springs.

There is a depression or space, C′, Figs. 1 and 2, in the foot, into which the lower part of the ankle fits and moves, as it is adjusted to any desired position by means of the ball-and-socket joint. The springs *c* also, in connection with the links *b*, give elasticity to the movements of the foot and ankle.

The toe is formed of a different piece, and is connected by a joint, D′, to the foot, being curved, as represented, with a pin or rod extending across the toe part, and passing through a metallic piece, near each side, that is secured to the foot, as indicated by the dotted lines *e* in Fig. 1, forming the joint, a strip of leather being attached to the toe and foot at the top, across where they come together, and there is a spring, *e′*, about the middle in the upper part of the foot that gives tension and elasticity to the joint.

To the heel of the foot is attached a strap, E, terminating in a hook, E′, that hooks into the spring F, as in Fig. 3, which represents some of the working parts of the leg detached.

H is a connecting-rod that passes through the bridge F′, secured to the sides of the leg through the spring *f* and piece *f′*, and is screwed into the head of the hook *g*, on which is placed the upper part of the spring F.

I is a sliding hook on the connecting-rod H, being secured in any desired place on the rod by the screw-bolt I′.

J is a hook attached near the top of the lower part of the leg, and on this hook and the hook J is placed the spring J′, the tension of which can at any time be increased or diminished by adjusting accordingly the sliding hook J on the connecting-rod.

At the top of the connecting-rod is formed the joint H′, an enlarged view of the section of which is seen in Fig. 5. There is a thimble, *h*, screwed onto the top, with a pin, *h′*, in the center, that rests on the box-cap *h″*, and extends up to the top of the thimble, by means of which the joints can be loosened or tightened by diminishing or increasing the pressure on the cap *h″*, that surrounds the top of the cross-piece H′, forming the joint, that is secured to the sides of the leg, as shown in Fig. 6. The upper part of the connecting-rod is kept in place by the plates *l* on each side, secured to the sides of the slot L of the leg.

The joint M at the knee consists of braces *m* on the outside of the leg, secured to the under part of the leg below the knee, as represented in Fig. 4.

Fig. 6 is a section through Fig. 4 in the direction of the lines *x*·*x*, showing a section of the joint M, which consists of a cross-bar, P, screwed into a bolt-head or journal, *p*, at one end, and the other end terminates in a head that fits in and can be turned round in a chamber in the head *p′*, as represented. The object of this is to tighten the joint when it gets loose in any way by simply turning the bar P. The heads *p p′* form a part of the upper end of the braces *m*, that extend into the leg, the screws *m′* being put in from the outside, as represent-

ed, leaving a space, *o*, between the end of the cross-bar and screw for an oil-chamber, in which may be placed any flocculent material to retain the oil.

k is a thin diaphragm below the knee-joint, having a slot, *k'*, in it for the connecting-rod to move back and forth in, as the position of the leg is changed. By bending the knee of the leg, as in Fig. 2, the connecting-rod moves down through the bridge F', relaxing the spring F, and increasing the tension of the spring J'. The connecting-rod vibrates and moves vertically in the bridge F', that being the axis of motion.

Fig. 9 is a perspective view of the padding R, Figs. 1 and 2, inside of the upper part of the leg, made of soft leather or any suitable material, with cotton tacked inside and laced up on one of the sides, as represented.

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

1. The strap E, spring F, connecting-rod H, and spring J', when arranged and operating as described.

2. The adjustable hook I, in combination with the rod H and spring J, arranged and operating in the manner and for the purpose set forth.

3. The bridge F', in combination with the strap E and springs F and J', and connecting-rod H, arranged and operated as specified.

4. The thimble *h*, pin *h'*, and cap-box *h''*, for the purpose specified.

5. The links *b*, rods *b'*, and springs *e*, in combination with the ball-and-socket joint D, arranged and operating as and for the purpose described.

6. The bar P and heads *p p'*, when constructed and arranged as described, for the purpose specified.

7. Uniting the thigh A and lower leg, B, by means of the connecting-rod H, joints H' and *m m'*, as herein specified.

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Witnesses:
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