

J. S. Drake,
Artificial Leg.
Patented Sep. 4, 1866.

N^o 57,691.

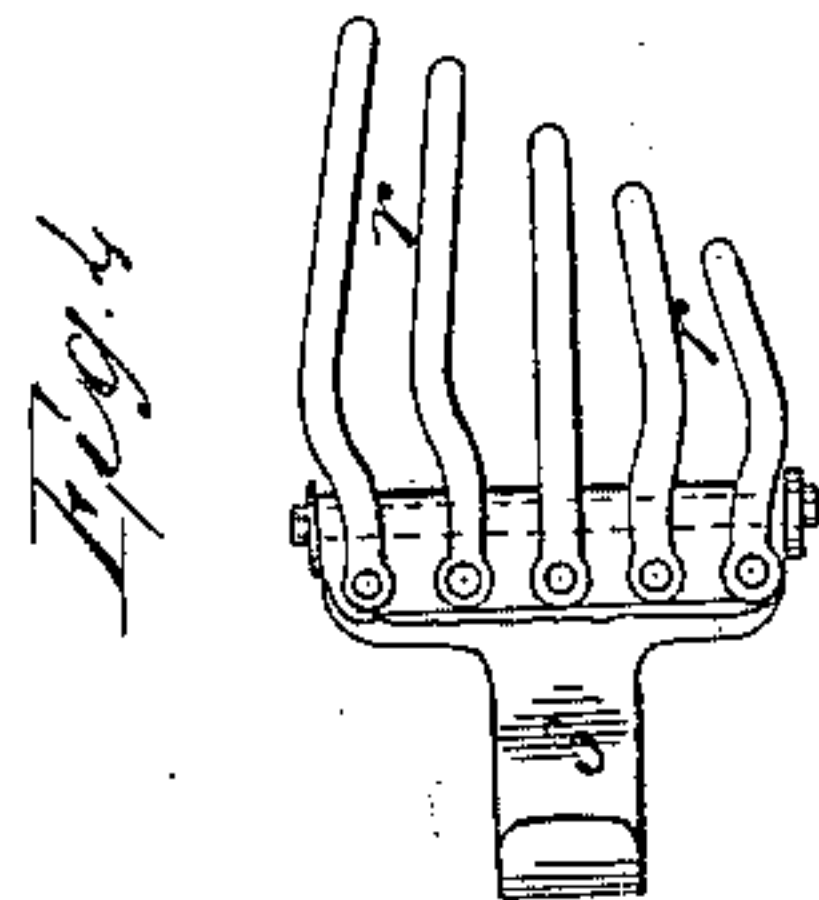


Fig. 2

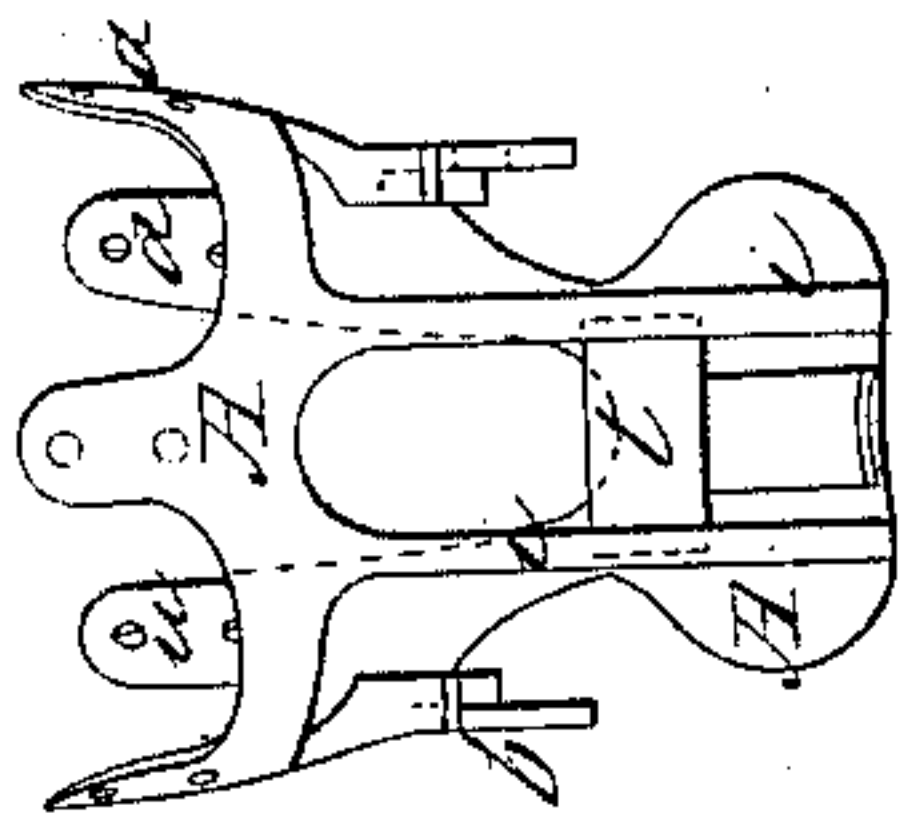


Fig. 3

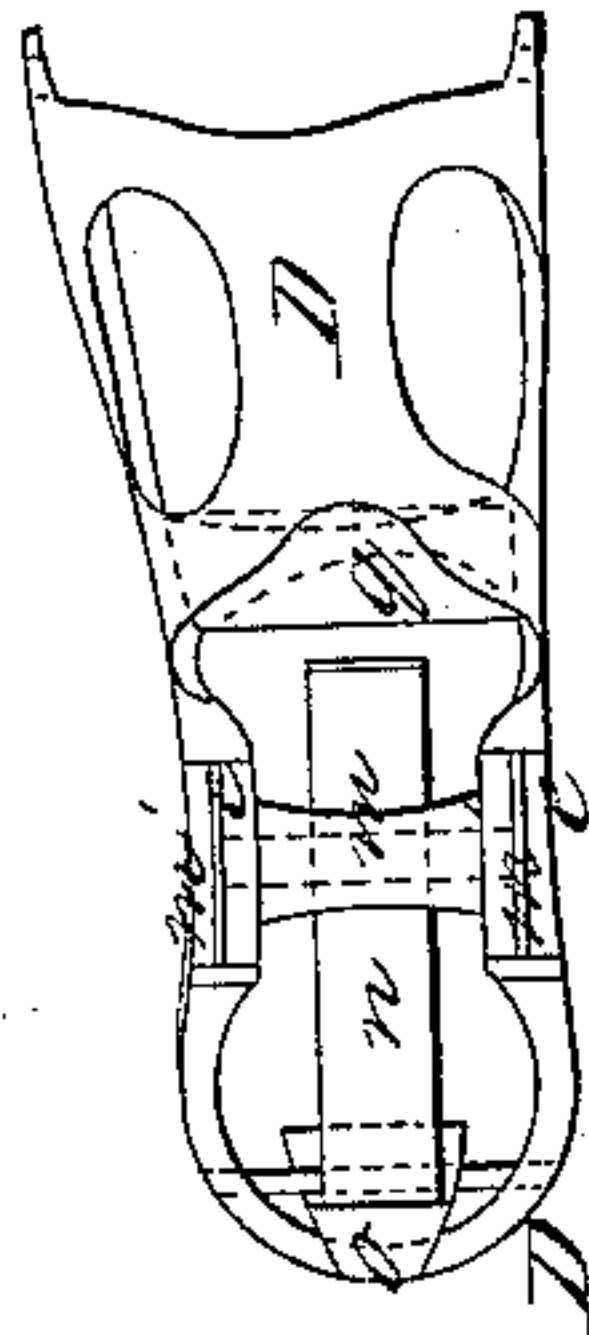
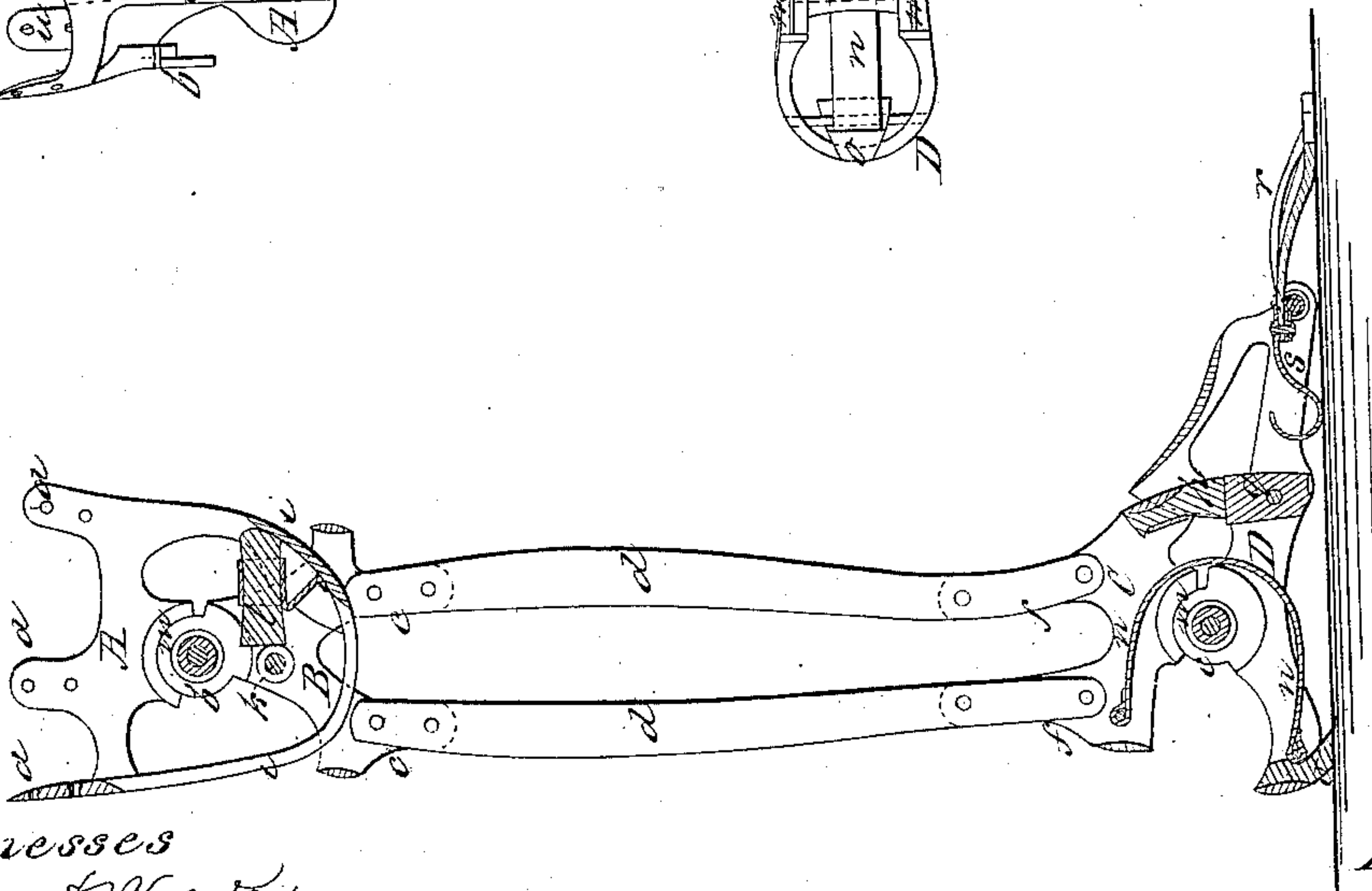


Fig. 1



Witnesses
Geo. D. Wall
Chas. H. Smith

Inventor
John S. Drake

UNITED STATES PATENT OFFICE.

JOHN S. DRAKE, OF NEW YORK, N. Y.

IMPROVEMENT IN ARTIFICIAL LEGS.

Specification forming part of Letters Patent No. 57,691, dated September 4, 1866.

To all whom it may concern:

Be it known that I, JOHN S. DRAKE, of the city and State of New York, have invented, made, and applied to use a certain new and useful Improvement in Artificial Legs; and I do hereby declare the following to be a full, clear, and exact description of the said invention, reference being had to the annexed drawings, making part of this specification, wherein—

Figure 1 is a vertical section of my improved artificial leg. Fig. 2 is a rear view of the upper knee-joint. Fig. 3 is a plan of the metal frame for the foot; and Fig. 4 is a sectional plan of the spring-toes detached.

Similar marks of reference denote the same parts.

In the construction of artificial legs in which metal is employed for the frames or skeletons of the parts it has been usual to bend up sheet metal into the desired shape and secure the parts by rivets, solder, &c. This mode of construction is costly and tedious, and the joints either have to be formed out of separate pieces or else the edges of the sheet metal are not wide enough to afford the proper wearing-surface; and in consequence of the motion to which the parts are subjected the rivets employed sometimes work loose and the solder breaks.

The nature of my said invention consists in a malleable cast-iron frame formed with projections constituting the parts of the ankle or knee joints, said malleable cast-iron frames varying in thickness at different portions, so as to furnish the requisite strength and wearing-surface at the particular parts, and the whole be as light as consistent with the required strength, this peculiar character of malleable cast-iron frame being adapted to the two parts of the knee-joint and to the two parts of the ankle-joint, including the foot as the lower part of such ankle-joint.

In the drawings, A is the malleable cast-iron frame with straps *a a* for receiving the ribs of the socket, and with the half-hinges of the joint *b*. B is the malleable cast-iron frame with the other half-hinges of the joint *b*, all formed as represented, and with the straps *c c* for the ribs *d d*, forming the lower joint of the leg. C is the malleable cast-iron frame forming the

upper portion of the ankle-joint *e*, and having straps *f f* for the reception of the lower ends of the ribs *d d*. D is the malleable cast-iron frame forming the foot and the lower half-hinge of the ankle-joint *e*. These malleable cast-iron frames A, B, C, and D are made with the necessary increase of thickness to form a proper bearing-surface at the respective joints, and to give the proper strength to the parts contiguous to said joints, while those portions exposed to less strain are made as thin as possible, and the edges of the different straps and connections are rounded, so as to form them sectionally of the shape of a flattened ellipse, that being done to obtain as much strength as possible and remove weight. By making these pieces of malleable cast-iron the hinges for the joints can be bored, turned, and fitted with great accuracy, so that they will work with the required amount of friction, but will not bind or be too loose at any portion of their motion.

I extend straps *i i* around from the front to the back of the upper knee-joint frame, A, which connect the parts, and at the same time prevent the material forming the covering of the leg getting into the frames A and B when the leg is bent.

Across the frame B, I put a bar, *k*, covered with india-rubber, to form a stop for the rubber block *l*, which prevents the knee-joint turning beyond a given point as the leg is straightened.

The joints *b* and *e* of the knee and ankle are formed by the half-hinges upon the respective parts, and a metal pipe, *m*, surrounds the hinge-pin or screw between the two sides of the hinge, and washers *m'*, of brass, are introduced between the parts, as shown, to make the friction more uniform and render frequent oiling unnecessary.

The toe end of the foot is held up by the bent spring *n*, that acts between C and the heel end of the foot to press that down.

o is a yielding block attached to the back portion of the heel, which first comes in contact with the surface stepped upon to bring the toes down, and *p* and *q* are yielding blocks that come into contact as the body is thrown forward and the person rises upon the toes.

The toes *r* are set upon a cross-bar and pro-

vided with a spring, *s*, as shown in Letters Patent granted to me August 31, 1852; but instead of making the toes themselves of one plate of metal notched out I make the spring-toes of separate pieces of metal with an eye at the inner end of each, through which passes a rivet, so that the toes may be spread or contracted for causing them to correspond in appearance, when in the boot or shoe, with the toes of the natural foot.

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

1. The malleable cast-metal frame for artificial limbs formed in the manner and for the purposes specified.

2. The straps *i i* of the cast-metal frame A,

applied in the manner and for the purposes set forth.

3. The spring metallic frames for the toes, each attached by a separate rivet or screw, so as to be movable, as set forth.

4. The curved metal spring *n*, introduced at the ankle-joint, with its ends attached to the heel D and frame C, and acting to keep the toes of the foot from dropping, as set forth.

In witness whereof I have hereunto set my signature this 30th day of March, A. D. 1866.

JOHN S. DRAKE.

Witnesses:

GEO. D. WALKER,
CHAS. H. SMITH.