

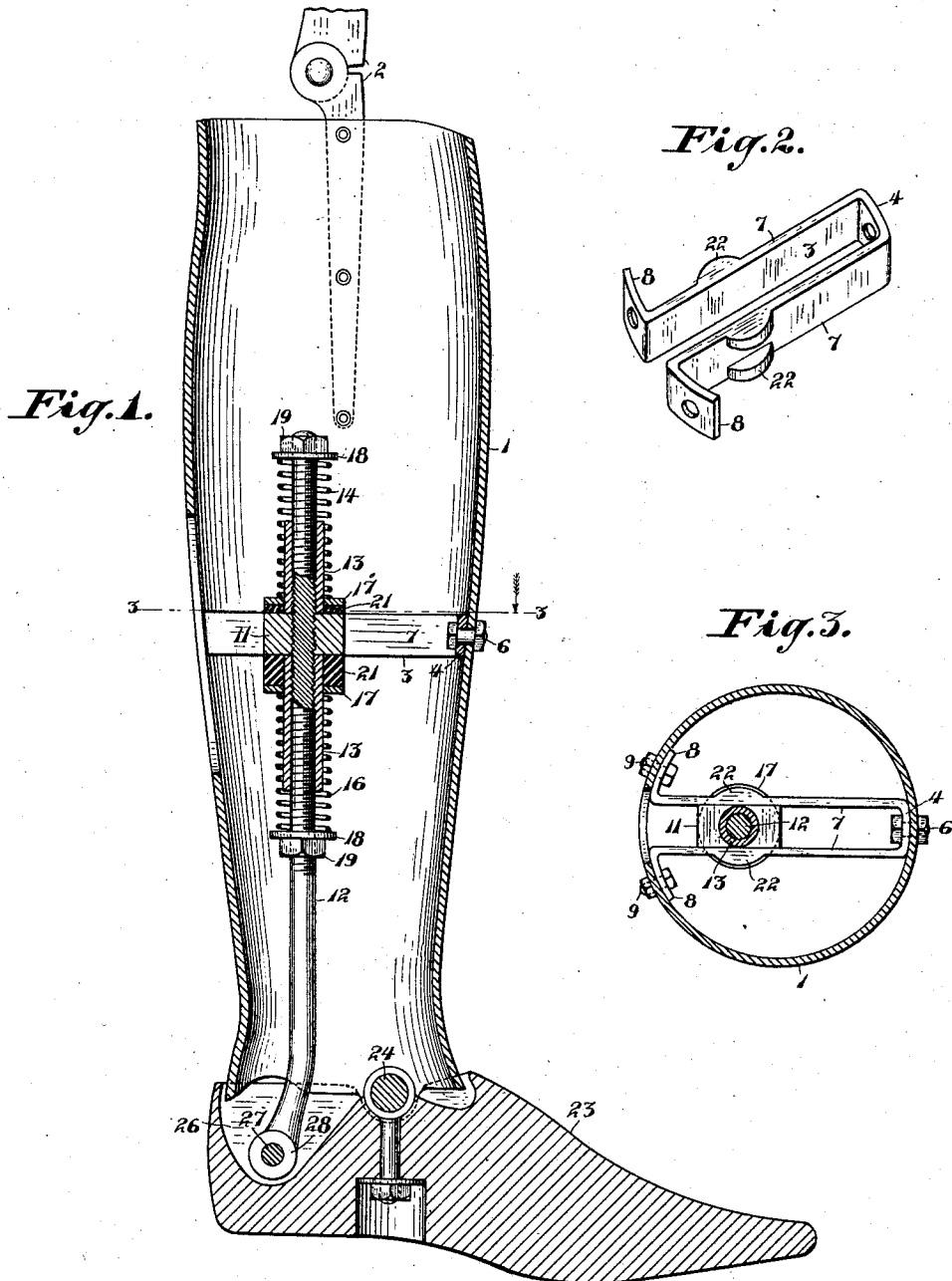
J. W. HODGE & H. E. LA PLANT.

ARTIFICIAL LEG.

APPLICATION FILED APR. 3, 1912.

1,049,862.

Patented Jan. 7, 1913.



WITNESSES

G. C. Friedner
N. B. Keating

INVENTORS

J. W. Hodge,
H. E. LaPlant,

BY

F. M. Wright

ATTORNEY

UNITED STATES PATENT OFFICE.

JAMES W. HODGE AND HARRY E. LA PLANT, OF KENNETT, CALIFORNIA.

ARTIFICIAL LEG.

1,049,862.

Specification of Letters Patent.

Patented Jan. 7, 1913.

Application filed April 3, 1912. Serial No. 688,126.

To all whom it may concern:

Be it known that we, JAMES W. HODGE and HARRY E. LA PLANT, citizens of the United States, residing at Kennett, in the county of Shasta and State of California, have invented new and useful Improvements in Artificial Legs, of which the following is a specification.

The present invention relates to improvements in artificial legs.

The object of the present invention is to provide an artificial leg having great freedom of movement at the ankle and having a knee and ankle action very closely resembling that of the natural leg, one which will be extremely free from jar in walking, one which will support with great comfort and ease the wearer when in a standing position, which can be readily adjusted to variations in weight of the wearer, and which will permit of easy ascent or descent, both on flat surfaces as stairs, and on sloping ground.

In the accompanying drawing, Figure 1 is a vertical sectional view of our improved artificial leg; Fig. 2 is a perspective view of a guideway detached; Fig. 3 is a cross-section on the line 3—3 of Fig. 1.

The illustration and description of the upper portion of the device, which is attached to the stump of the leg, are here omitted, being of the usual construction.

1 indicates the casing of the intermediate portion of the leg, made of any suitable material, and having secured at the top thereof the hinge straps 2 for attachment to the upper portion of the artificial leg. Within said casing 1 is a guideway 3 formed of a single piece of steel bent so as to form a central member 4, screwed as shown at 6, to the front portion of the casing and parallel side members 7 extending from said central member, and bent outwardly at their terminal portions 8 to fit snugly against the inner rear surface of the casing 1 and secured thereto by screws 9. Said members 7 thus form a guideway, in which can slide a rectangular nut 11 screwed on a stem 12, threaded at its upper portion throughout the greater part of its length. Also on said threaded portion of the stem, one on each side of the nut 11, are sleeves 13, screwed tightly up against the upper and lower ends of said nut respectively, for the purpose of furnishing smooth interior guides for upper and lower coiled springs 14, 16, which

surround the sleeve and stem and are compressed between washers 17 around the sleeves 13 and terminal washers 18. The terminal washers are held in place by upper and lower nuts 19, screwed on said stem, and the washers 17 are supported against the spring pressure by means of rubber rings 21 interposed between said washers and the upper and lower edges respectively of the side members of the guideway, said side members being, at the parts adjacent to said rings, formed with outwardly extending flanges 22, against which said rubber rings rest, so that the cutting of the rubber is avoided.

23 indicates the foot portion of the artificial leg, hinged in the usual manner, as shown at 24, to the casing 1. The heel of said foot is recessed, as shown at 26, and in said recess is a transversely extending pivot 27, which passes through a bearing 28 formed on the lower end of the stem 12.

The advantages of our invention will now be readily apparent. In the first place, the upper and lower springs assist the wearer in maintaining a standing position, for any forward bending movement of the leg from the erect position is resisted by the pressure of the upper spring, which, by said bending movement, would be compressed, and in like manner a rearward movement is resisted by the lower spring. It will be observed that, when either spring is thus called into action, the other spring has no effect whatever. For instance, if the leg be bent forward, then the stem 12 is drawn down, which has the effect of compressing the upper spring 14 between the upper washers 18, 17, but the lower spring is, by said downward movement of the stem, not caused to expand for the nut 11 moves downward with the stem, and thus the lower spring is compressed equally as before between the lower washers 18, 17.

It will readily be seen that, with this construction ample angular movement of the ankle in walking is possible, and, if the foot be resting on the ground, the lower part of the leg can be moved through a very wide angle relatively to the foot, and therefore also the knee can be bent through a very wide angle. After each such bending, the upper spring assists in restoring parts to their normal position. For, in walking forward, the foot being on the ground and the casing 1 being bent in a forwardly direction,

said upper spring 14 is compressed. This compression of said upper spring continues while the weight of the body is transmitted through the artificial leg and foot, and until the wearer has moved to such a position that said artificial leg is at the rear, and, when the weight of the body is removed therefrom, in walking, the expansion of the spring from its compressed condition acts to lift the foot from off the ground, and renders it easier for the wearer to advance it again to its former position. In placing the foot upon the ground again in the forward position, the lower spring 16 is first compressed, and the expansion of this spring then not only acts as a cushion in preventing the jar upon the body when coming in contact with the ground, but it aids the body in passing to the front of the artificial leg which is at this time on the ground.

On account of the large amplitude of angular movement which is permissible to the foot relatively to the casing 1, this artificial leg is particularly adapted for ascending and descending, both on flat surfaces as stairs, and on sloping surfaces as the side of a hill.

By adjusting the nuts 11 and 19 to vary the pressures of the springs, the leg can be perfectly adapted to support the weight of the wearer.

While the washers 17 and rings 21 serve to increase the resiliency and durability of the device, it will readily appear that the really essential feature of the construction is that the diameter of the springs should be less than the length of the nut or slide piece 11, and greater than the width of the guideway 7, so that the inner ends of said springs can pass outwardly from the guideway with the nuts, but cannot pass through the guideway with said nuts.

We claim:—

1. In an artificial leg, the combination of a casing, a foot portion pivotally secured thereto, a guideway secured to the said casing, a stem pivoted to the foot portion at the rear of the pivot of the latter to the casing and passing through said guideway, abutments on said stem on opposite sides of the guideway, a device secured to said stem and slidable in said guideway, and coiled springs

around said stem on opposite sides of said guideway between said device and abutments, each spring being of a diameter greater than the width of said guideway, and less than the length of said device.

2. In an artificial leg, the combination of a casing, a foot portion pivoted thereto, a guideway secured to said casing, a threaded stem pivoted to the foot portion at the rear of the pivot of the latter to the casing and passing through said guideway, nuts screwed on said stem on opposite sides of said guideway, sleeves screwed on said stem between said nuts and the guideway, washers around the stem on opposite sides of the guideway, and coiled springs between said nuts and the washers.

3. In an artificial leg, the combination of a casing, a foot portion pivoted thereto, a guideway secured to said casing, a threaded stem pivoted to the foot portion at the rear of the pivot of the latter to the casing and passing through said guideway, a nut screwed on said stem and slidable in said guideway, sleeves screwed on said stem and abutting against said nut, nuts screwed on said stem at points remote from the guideway, washers around said sleeves, and coiled springs between the last-named nuts and the washers.

4. In an artificial leg, the combination of a casing, a foot portion pivoted thereto, a guideway secured to said casing, a threaded stem pivoted to the foot portion at the rear of the pivot of the latter to the casing and passing through said guideway, a nut screwed on said stem and slidable in said guideway, sleeves screwed on said stem and abutting against said nut, nuts screwed on said stem at points remote from the guideway, washers and rubber rings around said sleeves, and coiled springs between the last-named nuts and the washers.

In testimony whereof we have hereunto set our hands in the presence of two subscribing witnesses.

JAMES W. HODGE.
HARRY E. LA PLANT.

Witnesses:

L. L. STILLSON,
W. GREGG.