

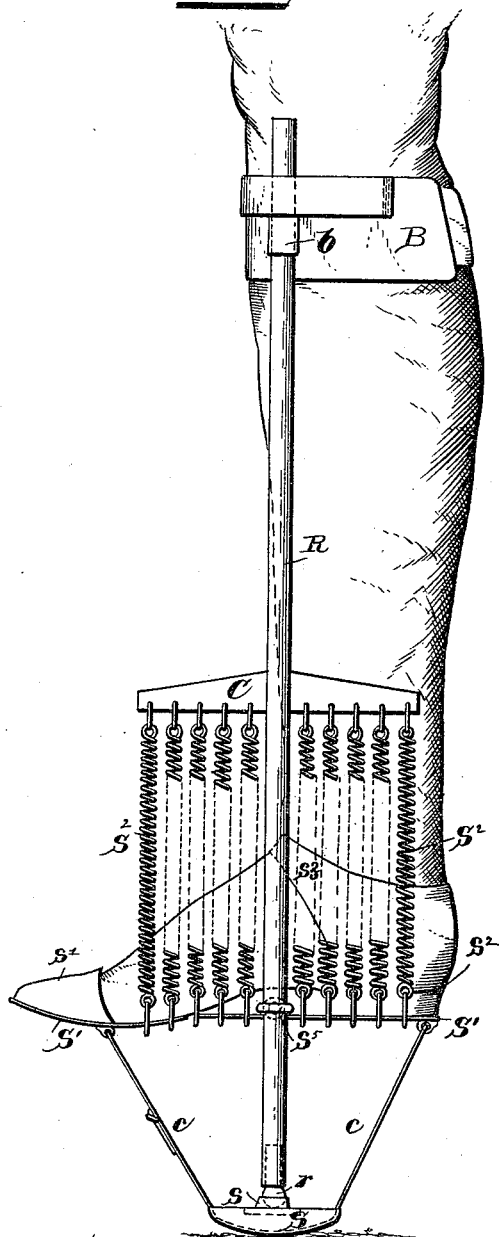
N. YAGN.

APPARATUS FOR FACILITATING WALKING, RUNNING, AND JUMPING.

No. 438,830.

Patented Oct. 21, 1890.

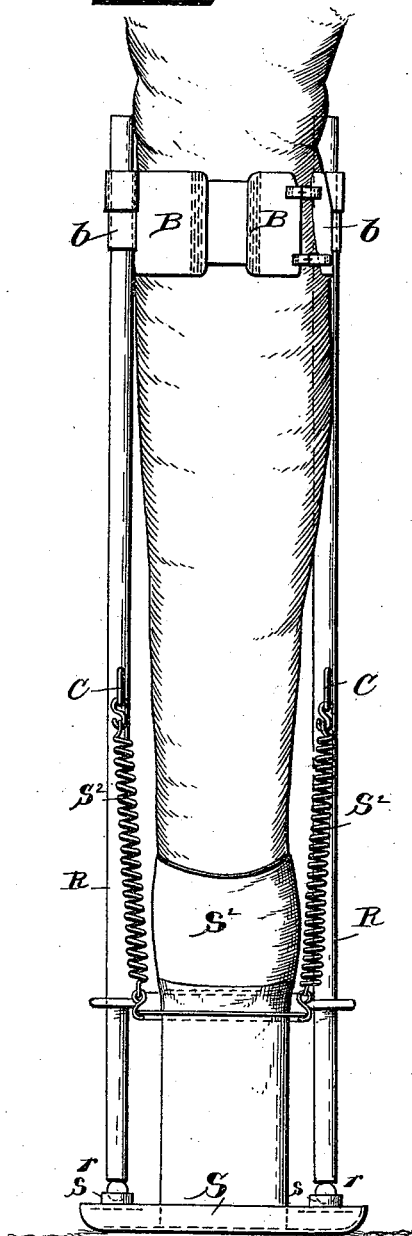
*Fig. 1.*



Witnesses.

*J. Thomson Cross,*  
*Henry J. Dieterich*

*Fig. 2.*



Inventor:

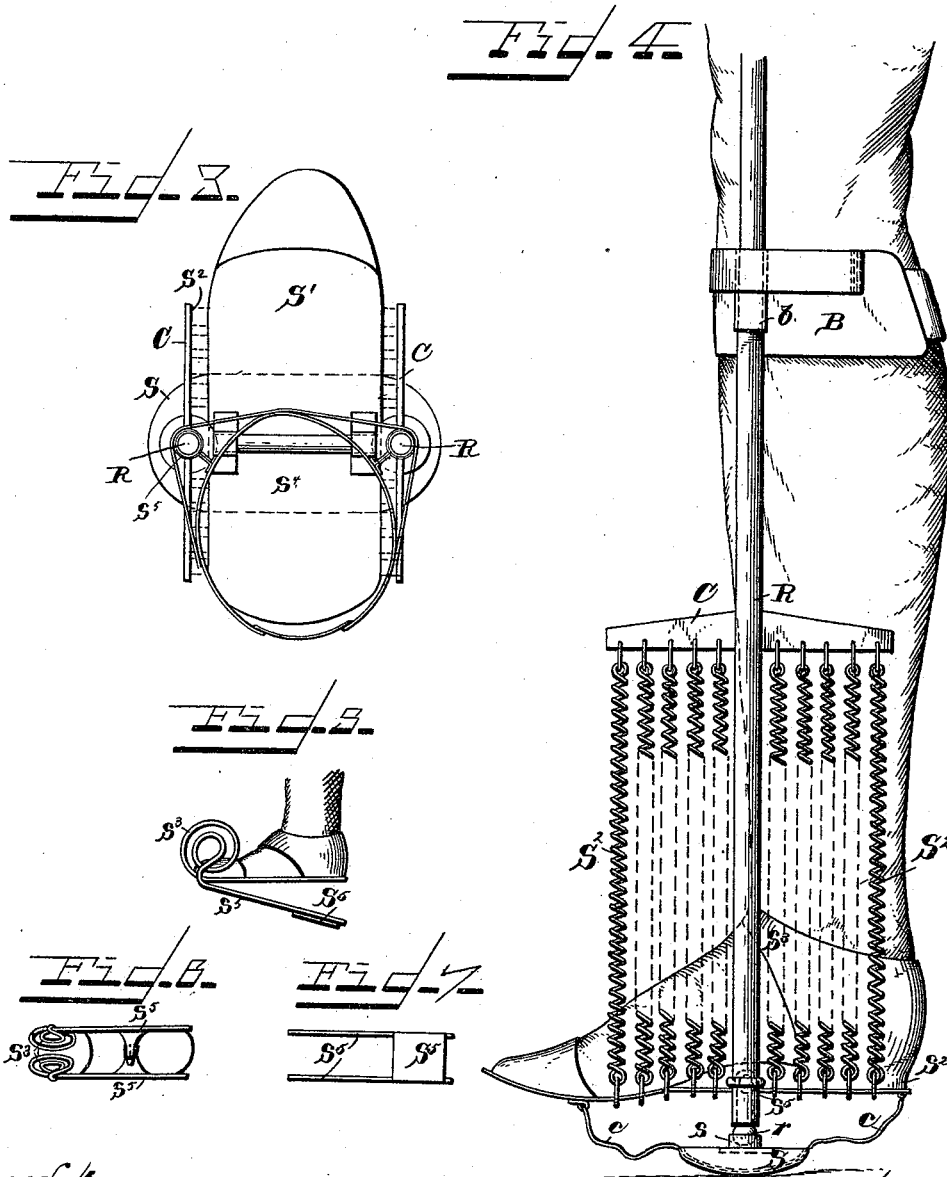
*Nicholas Yagn.*  
per *Henry Oth*  
*Attorney.*

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per *Henry Oth*  
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# UNITED STATES PATENT OFFICE.

NICHOLAS YAGN, OF ST. PETERSBURG, RUSSIA.

APPARATUS FOR FACILITATING WALKING, RUNNING, AND JUMPING.

SPECIFICATION forming part of Letters Patent No. 438,830, dated October 21, 1890.

Application filed February 11, 1890. Serial No. 340,021. (No model.)

*To all whom it may concern:*

Be it known that I, NICHOLAS YAGN, mechanical engineer, a subject of the Emperor of Russia, and residing at St. Petersburg, Russia, have invented certain new and useful Improvements in Apparatus for Facilitating Walking, Running, and Jumping; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification, and in which—

Figure 1 is a side elevation of an apparatus embodying my invention, and Figs. 2 and 3 are respectively a rear elevation and top plan view thereof. Fig. 4 is a view similar to Fig. 1, illustrating the apparatus in its position when the weight of the body is thrown upon it. Figs. 5, 6, and 7 show in side elevation and top and bottom plan views, respectively, a modified form of power-accumulator.

The invention relates to apparatus for facilitating walking, running, and jumping, and has for its object certain improvements on similar apparatus for which I have obtained Letters Patent of the United States of America, dated July 2, 1889, No. 406,328; January 28, 1890, Nos. 420,178 and 420,179, respectively. In the apparatus described in the aforesaid patents the *vis viva* of the dead weight of the human body or trunk in walking, running, or jumping is taken up and multiplied by springs, so arranged that the power thereof will be exerted either at the seat, or at the waist, or under the arms.

The present invention has for its object to provide means whereby not only the *vis viva*, resulting from the act of walking, running, or jumping is utilized, but also the weight of the body itself, so that at each displacement of the legs the power exerted by the weight of the body, plus the *vis viva*, is made available for propulsion.

To these ends the invention consists in an apparatus composed, essentially, of a power accumulating or multiplying device adapted to take up, multiply, and store the power developed by the weight of the body, and in ad-

dition thereto the *vis viva* developed in the act of walking, running, or jumping.

The invention further consists in details of construction and combinations of parts, as will now be fully described, reference being had to the accompanying drawings.

The power accumulating and storing apparatus comprises a shoe S, provided with ball-socket bearings *s* for the ball-bearings *r* of two vertical rods R, whose upper ends pass through guide-sleeves *b*, secured to a strap or belt adapted to be buckled to the legs below the knees B. To each rod R is secured a cross head or tree C, to which is hooked or otherwise connected one end of a number of helical or spiral springs S<sup>2</sup>, the other end of which is hooked or otherwise connected to a slipper S', provided with a toe *s'*, a heel *s''*, and instep-straps *s'''*. The shoe S may be of wood or other suitable material, and if of wood it is preferably soled with sheet metal. The construction described, as will be readily understood, is simply a pair of stilts in which the usual rigid step is done away with and a spring-suspended step used in lieu thereof. The slipper S' is provided with a cross-bar *s<sup>4</sup>*, at each end of which is formed a guide-eye *s<sup>5</sup>*, Fig. 3, for the passage of the rods R, so as to allow of free vertical movement of the slipper along said rods. The shoe S is connected with the slipper S' by means of straps or chains *c*, that are preferably made in two parts adjustably connected together, as by buckle in the case of straps or a pin in the case of chains, and serve to limit the upward motion of the slipper along the rods R.

It is obvious that if a person steps into the slippers S' after passing the rods R through the tubular guides *b* of straps or belts B B, buckling the belt around the legs below the knees and strapping the slippers to the feet, the apparatus will be securely held in position and the springs S<sup>2</sup> distended under the weight of the body, as shown in Fig. 4. The moment one of the accumulators is relieved of the weight of the body in the act of walking, running, or jumping, the power stored by the springs S<sup>2</sup> will be given up and the leg not then supporting the weight of the body will be lifted by said stored power. As the foot again comes to the ground the weight of the

body, as well as the additional power due to the impulse or momentum of the body is thrown upon the springs, taken up thereby, and again given up when the foot is lifted for the next step. It will be readily seen that the fatigue inherent to the exercise of walking, running, or jumping is greatly reduced thereby, enabling a person to walk, run, or jump for a much longer time than would otherwise be the case, and in running or jumping cover more space than is the case without the apparatus.

In Figs. 5 to 7 I have shown a modified form of power-accumulator, the slipper being here provided with a volute spring  $s^3$  on each side, whose arms  $s^5$  are connected to a heel-plate  $S^5$ . It is obvious that in walking, running, or jumping the spring will not only take up the weight of the body, but also the power due to the momentum of the body while in motion.

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

1. In an apparatus for facilitating walking, running, and jumping, a power-accumulator comprising a stilt, a foot-step, and a resilient support for said foot-step, substantially as and for the purposes specified.

2. In an apparatus for facilitating walking, running, and jumping, a power-accumulator comprising a stilt, a foot-step, a resilient support for said foot-step, and a guide to guide the foot-step along the stilt when displaced under the resilient action of its support, substantially as and for the purposes specified.

3. An apparatus for facilitating walking, running, or jumping, a power-accumulator consisting of a shoe and a slipper, guide-rods pivotally connected with the shoe and on which guide-rods the slipper is free to move verti-

cally, a cross bar or tree for and rigidly connected with each of the guide-rods, and helical springs connected with the cross-trees and the slipper, in combination with a belt provided with tubular guides for the upper end of the guide-rods, substantially as and for the purposes specified.

4. An apparatus for facilitating walking, running, or jumping, the power-accumulator consisting of a shoe and a slipper, a guide-eye on each side of said slipper, guide-rods connected with the shoe by a universal joint, said rods passing through the eyes on the slipper, a cross-tree for and rigidly connected with each of the guide-rods, and helical springs connected with the cross-trees and the slipper, in combination with a belt provided with tubular guide-sleeves for the upper end of the guide-rods, substantially as and for the purposes specified.

5. An apparatus for facilitating walking, running, or jumping, the power-accumulator consisting of a shoe and a slipper, said slipper having a guide-eye on each side and a flexible connection between the shoe and slipper, guide-rods connected with the shoe by a universal joint, said rods passing through the eyes on the slipper, a cross-tree for and rigidly connected with each of the guide-rods, and helical springs connected with the cross-trees and the slipper, in combination with a belt provided with tubular guide-sleeves for the upper end of the guide-rods, substantially as and for the purposes specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

NICHOLAS YAGN.

Witnesses:

N. TSCHERKALOFF,  
J. BLAU.