(No Model.)

W. H. ELLIOT.

ROLLER SKATE.

No. 323,405. Patented Aug. 4, 1885.

Fig. 1.

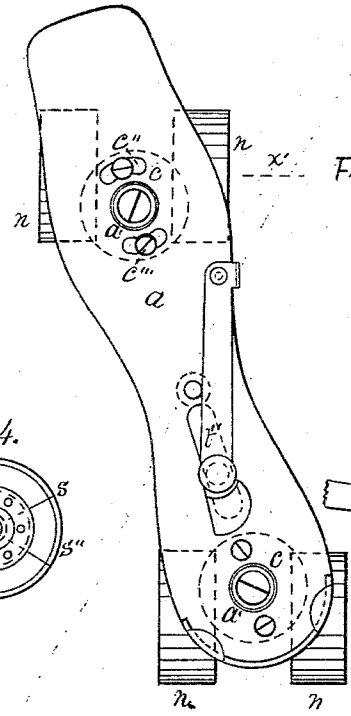

Fig. 3.

Fig. 2.

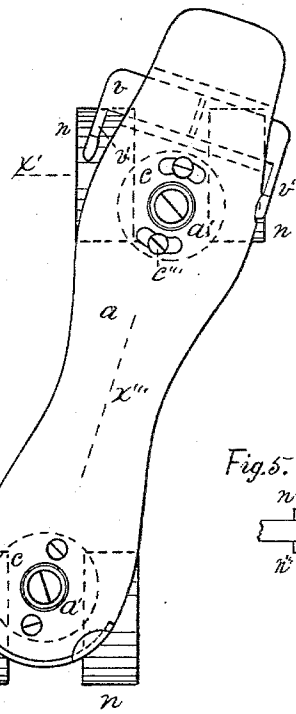

Fig. 4.

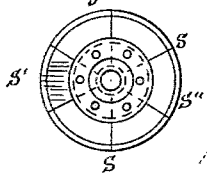

Fig. 5.

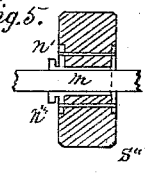

Fig. 6.

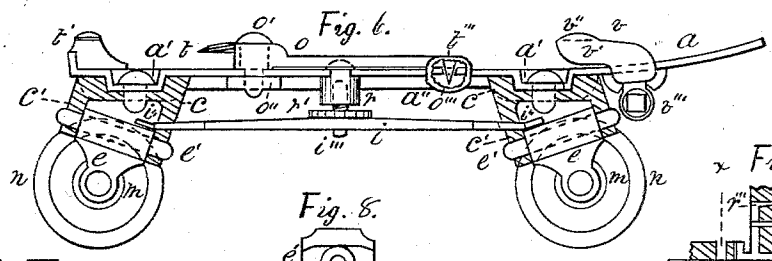

Fig. 7.

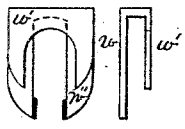

Fig. 8.

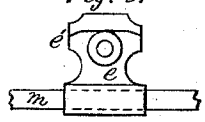

Fig. 9.

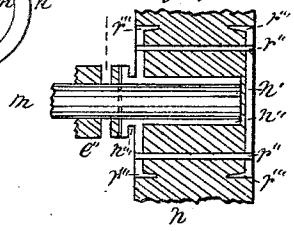

Fig. 10.

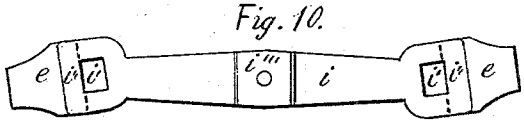

Fig. 11.

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UNITED STATES PATENT OFFICE.

WILLIAM H. ELLIOT, OF ILION, NEW YORK.

ROLLER-SKATE.

SPECIFICATION forming part of Letters Patent No. 323,405, dated August 4, 1885.

Application filed February 4, 1885. (No model.)

To all whom it may concern:

Be it known that I, WM. H. ELLIOT, of Ilion, county of Herkimer, and State of New York, have invented a new and Improved Roller-Skate, of which the following is a specification.

The object and nature of my invention may be described as follows:

The object of my invention is to provide roller-skates that shall force the wearer to assume natural positions and to make natural movements while skating, thereby avoiding the injury to young persons arising from the use of skates that confine them to unnatural positions, and consequently to unnatural and ungraceful movements; and it also aims to provide a skate which shall be cheaper, simpler, and more practicable than any now in use; and the nature of my invention consists in the novel assemblage of certain co-operative devices which shall accomplish the above objects.

I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a plan of the skate, showing the heel-clamps. Fig. 2 is a plan of the skate, showing the sole-clamps. Fig. 3 is an elevation of the clamping-lever. Fig. 4 is an elevation of my improved skate-roller. Fig. 5 is a section of the same. Fig. 6 represents a vertical longitudinal section of the tread of the skate with the hangers attached thereto and the small parts in elevation. Fig. 7 is two views of a device for holding the rollers on the axle. Fig. 8 is an elevation of a swiveled roller-frame. Fig. 9 is a section of a roller and a portion of a roller-frame. Fig. 10 is a plan of the springs for controlling the roller-frames. Fig. 11 is a section of the roller-frame at open lines *x*, Fig. 9.

My invention refers particularly to skates having four rollers each—two front and two rear rollers—though it may be applied practically to skates having any other number of rollers.

In the use of roller-skates as they are now universally manufactured, there is great danger, particularly in case of very young persons, that they will become permanently knock-kneed or in-kneed; and this is brought about by the necessity they are under of bending their knees to throw the weight of the body forward of the rear rollers, while at the same time they have to throw their heels out until the central or axial line of the tread of the skate is parallel with the line of travel. This gives all skaters while on the floor the appearance of being more or less in-kneed—a deformity easily avoided by the use of properly-constructed skates.

By reference to Figs. 1 and 2, it may be seen that while the axis of the rollers *x'* is exactly at right angles to the line of travel *x''*, the center line of the tread of the skate *x'''* is inclined, the right one about fifteen degrees to the right and the left one about fifteen degrees to the left, making a divergence of about thirty degrees from each other when running straight forward with all the rollers on the floor. The positions of the treads shown in these figures is supposed to be about the natural one. This arrangement of the center line of the tread in relation to the line of travel and to the axis of the rollers gives the skater a base about four inches wider to stand upon without separating his legs, and it brings the right rear roller of the right skate substantially upon the path of the left front roller of the same skate and the left rear roller of the left skate upon the path of the right front roller of the same skate. The movement of the ankle necessary to roll the tread on the diagonal bearings of the roller frame is much more safely accomplished, particularly by beginners, with the foot in a natural position than it is with the center line of the two skates parallel.

Fig. 4 represents my improved skate-roller divided radially into several sections, as at *s*, with the grain of the wood arranged radially, as shown at *s'*, the corners of the roller being beveled off, as at *s''*, to prevent chipping. This arrangement brings the inner end of the grain of the wood upon the axles and the outer end upon the floor, which increases the durability of the roller to a very great degree.

In Fig. 9 the roller *n* is shown to be provided with metallic plates *n'* on both sides, the outer one covering the center hole to prevent oil from working through the rollers, and

both provided with annular projections or rings r''', which are forced into the sides of the roller to fasten the several sections together, and these rings may be used with or without the metallic plates or cement, though it would be safer to use both. The inner plate has a tubular projection, n'', which lines the roller and serves as a box or bearing for the axle. It also has a hub on its inner side, provided with the annular groove n'''. The hub of the roller-frame also has grooves e'' upon each side of it, as shown in Fig. 11, which is a section of the same at x, Fig. 9. These grooves e'' and the annular groove n''' in the hub of the roller are adapted to receive the U-shaped and forked key w, (shown in Fig. 7,) which serves the purpose of a linchpin to keep the roller on the axle.

In application the long and narrow fork w'' passes into the groove e'' and the wider and shorter fork w' passes into the annular groove n''' in the hub of the roller, and so fastens the roller to the roller-frame. This key may be fastened in place by narrowing the long fork a little at the points, as shown in Fig. 7; or it may be kept in place by any other suitable fastening which can be readily removed for cleaning.

The tread of the skate is provided with flanges a'' at the sides to give it strength. It is also provided with a cup-shaped depression, a', on the top to make room for the head of a large central screw to hold the hanger c in place. The hangers are also provided with small screws to prevent them from rotating on the central screw. The hangers c have two downward-projecting arms, c', which are provided at their lower end with eyes for the reception of the pin e', upon which the roller-frame swings or upon which the tread rocks in turning curves.

By reference to Figs. 1 and 2 it may be seen that the holes in the tread for screws c'' over the forward rollers is elongated to permit a slight rotatory movement of the hanger on a vertical axis, so that each skate may be adjusted to the peculiarities of the feet of the skater, while the hanger over the rear rollers may be permanently fixed to the tread.

The necessity for making the forward hanger adjustable arises from the fact that it is very seldom that two persons can be found that tread a pair of skates alike, and very often there is a great difference in the two feet of the same skater.

By the adjustment here proposed one or both skates may be made to run in or out, as necessity dictates.

Figs. 6 and 10 represent the roller-frame spring i resting at each end on the top of the roller-frame, provided with the bar i'' across the ends, and the opening i', through which the long arm of the hanger c passes. The spring is supported upon the tread of the skate by the stud r and adjusting thumb-screw r'. This screw has a stem, i''', passing through the spring for holding the same in a central position. It is also screwed into the lower end of the stud, whereby the force of the spring may be increased or decreased by turning the screw one way or the other. The arm of the hanger holds the two ends of the spring in position.

Figs. 1, 3, and 6 show the fastening-lever o attached to the tread by the screw o' and nuts o'', which are adjustable in slots t'' in the usual way. The rear end of the lever has a sharp, projecting, cam-shaped, and spiral edge t, which is shown in Fig. 1 to be cam-shaped and in Figs. 2 and 6 to be spiral. It also has on its forward or free end point t''', which drops into opening o''' in the tread for holding it in the locked position.

In application the free end of the lever is to be brought to the position indicated at u. Its fulcrum-screw o' is then moved back until the cam-shaped edge t touches the heel of the boot, and fastened by nuts o''. The lever is then brought to the position shown in Fig. 1, and the point t''' dropped into the opening o''', as shown in Figs. 1 and 6, which not only forces the heel back upon the spurs t', but by its spiral edge forces the boot-heel down upon the tread.

Figs. 2 and 6 show an improved sole-clamp, v. It has the usual transverse slides and adjusting-screw, v''', and spur v''. It also has an arm, v', which extends backward from the screw and slides to a point where the spur takes a stronger hold on the sole. These arms are made thin, so as to have a slight elasticity, whereby the sole is held more tenaciously than it would be by more rigid arms.

I have herein shown and described the roller-carrying devices as consisting of the hanger c, wheel-frame e, and axle m. The several features of the invention, however, will apply with equal facility to any other kind of roller-carrying devices.

Having described my invention, what I desire to have secured to me by Letters Patent of the United States is—

1. The combination, in roller-skates, of tread a, roller n, and axle or bearing m, with suitable intermediate roller-carrying devices fixed to said tread, the roller-carrying devices being in such arrangement with said tread that when both skates are on the floor and moving in a right line the medial line of the right tread shall diverge from the line of travel and the plane of the roller to the right, and the medial line of the left tread shall diverge from the line of travel and the plane of the roller to the left, substantially as specified.

2. In a roller-skate, the U-shaped double-forked key w, constructed substantially as described, in combination with groove e'' in the hub of the roller-frame and the annular groove n''' in the hub of the roller, as set forth.

3. In a roller-skate, a hanger, c, having a slight rotary movement on a vertical axis, as upon central screw a', and in combination therewith means of rigidly fastening the same

to the tread of the skate in any desired position, whereby the skate may be adjusted to the peculiarities of the skater's feet and securely fastened in said adjustment, substantially as specified.

4. In a roller-skate, the double-balanced and adjustable spring *i*, having the opening *i'* for the long arm of the hanger, and the bar *i''* across the end, in combination with the roller-frame *e* and the adjusting thumb-screw *r'*, substantially as specified.

5. In a roller-skate, the combination, with the tread thereof, of the sole-clamp *v*, provided with the spur *v''*, the screw *v'''*, and the rearward-extending arm *v'*, substantially as and for the purpose specified.

WM. H. ELLIOT.

Witnesses:
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GEO. D. RICHARDSON.