No. 687,878. Patented Dec. 3, 1901.

H. GLADE.

SKATE.

(Application filed Mar. 30, 1900.)

(No Model.) 2 Sheets—Sheet 1.

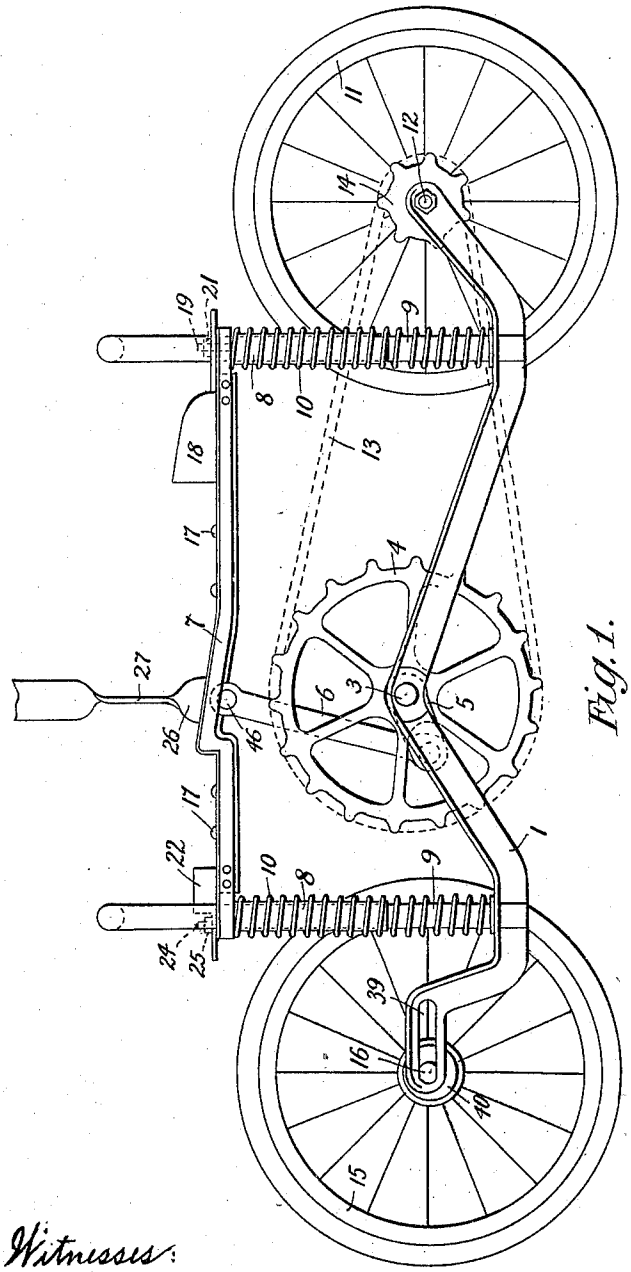


Fig. 1.

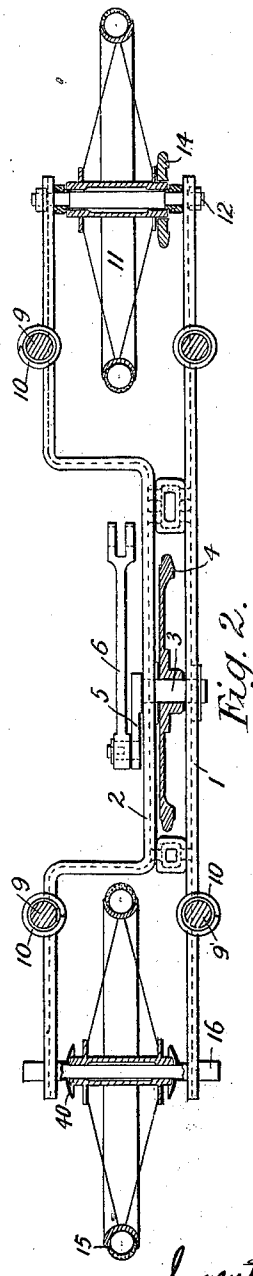


Fig. 2.

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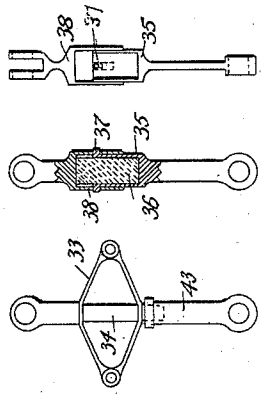


Fig. 9. Fig. 8. Fig. 7

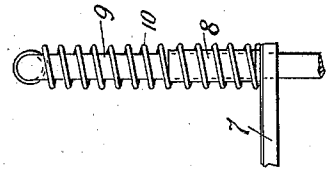


Fig. 10.

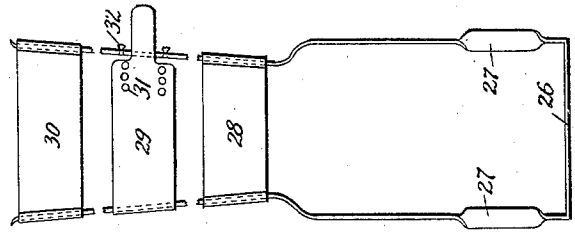


Fig. 6.

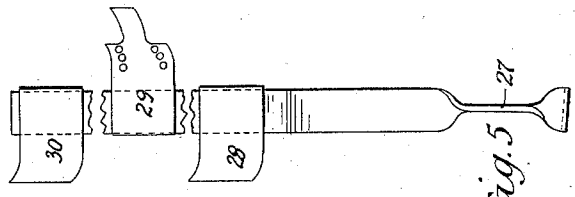


Fig. 5

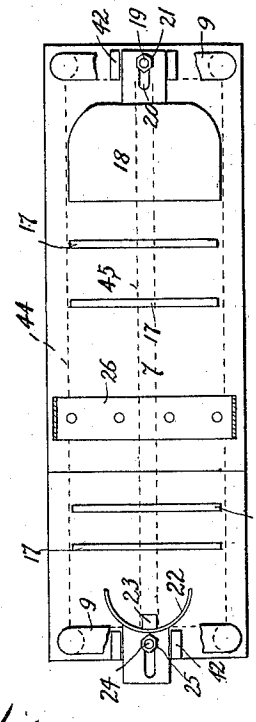


Fig. 3.

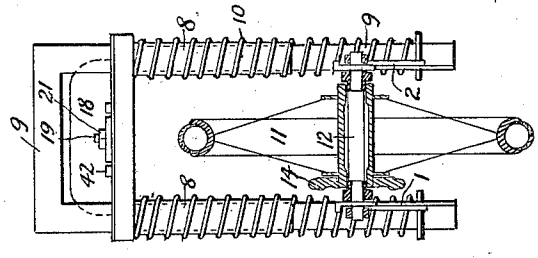


Fig. 4.

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

HENRY GLADE, OF NORTH FITZROY, VICTORIA.

SKATE.

SPECIFICATION forming part of Letters Patent No. 687,878, dated December 3, 1901.

Application filed March 30, 1900. Serial No. 10,792. (No model.)

To all whom it may concern:

Be it known that I, HENRY GLADE, a subject of the Emperor of Germany, residing at No. 4 Delbridge street, North Fitzroy, in the Colony of Victoria, have invented certain new and useful Improvements in Skates, of which the following is a specification.

My invention provides skates which are to be attached one to each of the feet of an operator for the purpose of propelling himself forward, the ordinary walking motion being applied to the skates—that is to say, an intermittent pressure being exerted upon them—to alternatively depress and raise the foot-plate to operate a crank and rotate a sprocket-wheel, and so give motion therefrom by chain to a small sprocket-wheel and to a front or controlling wheel, upon which said sprocket-wheel is mounted, the foot-plate being set upon springs and the back wheel being a free running and steering wheel.

In order to make my invention clear, I will now refer to the accompanying sheet of drawings, in which—

Figure 1 shows a side elevation of the skate; Fig. 2, a sectional plan of same; Fig. 3, a plan looking onto the foot-plate and showing toe and heel clips. Fig. 4 is a front sectional view of the skate. Fig. 5 shows side view of the means employed for securing the skate to the leg of the operator; Fig. 6, a front view of same. Figs. 7, 8, and 9 show cushioned connection-rods that may be employed to operate the crank. Fig. 10 shows the foot-plate suspended from spiral springs.

In the drawings, 1 2 represent longitudinal bent frame-plates, which extend from the front to the back wheels and form bearings for the axles of same and for a central axle 3, which carries a sprocket-wheel 4. The axle 3 has a crank 5 attached to it, and the latter is connected by a rod 6 to the foot-plate 7 of the skate by an articulated joint 46. The foot-plate may be constructed of a single plate of metal or, as represented in the drawings, of a frame 44, having a thin plate upon it, the central plate 45 of the frame receiving the pin 46 of connecting-rod 6. The foot-plate is mounted at each end on sleeves 8 8. Said sleeves encircle vertical rods 9 9, which pass through foot-plate 7 and are supported by the frame-plates 1 and 2, and to which they are secured. The rods may meet at top, as represented. Spiral springs 10 encircle the rods 9 and sleeves 8. The foot-plate is supported upon the said springs, and it is thus free to move vertically during the action of traveling. 11 represents the front or controlling wheel of the skate, whose axle 12 has bearings in the frame-plates 1 and 2, as aforesaid. The hub of the wheel 11 carries a small sprocket-wheel 14, and a sprocket-chain 13 connects between this sprocket-wheel and the larger central sprocket-wheel 4. The back wheel 15 is mounted on an axle 16, which is flattened and arranged to move in slots 39, formed in the frames 1 and 2, the frame here being of hardened steel. The axle 16 carries curved frictional plates or flanges 40. The wheels 11 and 15 are shown in section; but I have not described the construction of the bearing parts, as they may be as in ordinary bicycles with ball-bearings. The wheels are provided with pneumatic tires. The foot-plate is provided with strips 17 of rubber or other material to prevent slipping of the foot, or it may be corrugated for this purpose.

A toe-clip 18 is provided, consisting of a band portion to receive the toe of the boot and a flat portion for securing it to the foot-plate. This clip is adjustable by means of bolt 19, which passes through a hole in the foot-plate and through a longitudinal slot 20 in the clip 18, the said clip being secured in the required position by means of the nut 21. I provide also a heel-clip 22, having a circular upstanding portion to press upon the boot of the wearer and, if desired, also a spike 23 to press into the leather and a flat slotted portion to rest on the foot-plate, the heel-clip being adjustable in position in a similar manner to the toe-clip by the bolt 24 and nut 25. The toe and heel clips are both arranged to move along the foot-plate between guides 42.

In addition to the toe and heel clips just described I provide means for securing the skate to the leg of the operator and which consists of the following: a flat plate 26, which is secured by rivets or otherwise to the foot-plate 7 and is bent at either side upwardly. The uprights thus formed have flexible spring portions 27, which allow of ankle movement during operation of the skates, the uprights being extended and formed to

grasp the sides of the leg and having half-bands 28 29 30 for securing in position. The central (29) of these is provided with eyelet-holes 31, which receive studs 32, set on one of the uprights. Any other suitable form of clasp may be employed in lieu of this.

It may be desirable to render the connecting-rod which operates the crank 5 more or less elastic to prevent shock being transmitted to the foot-plate during operation. I have illustrated means of obtaining this effect. In Fig. 7 is shown a rod in two portions and a spring 33, connecting same together. One portion 43 of the rod is formed hollow to receive the other portion 34. Figs. 8 and 9 show another way of accomplishing this end—namely, by forming the rod, as before, in two portions, with a box 35 in one portion, in which is placed elastic material 36, the other portion of the rod having also a box 38 and being arranged to slide upon the aforesaid box 35, studs 37 being provided on the box 35, which pass through slots in the box 38.

In lieu of supporting the foot-plate upon springs in the manner described I may suspend it from springs placed above the plate on the vertical rods and connected to the top of the rods 9, as represented in Fig. 10.

I have above described one skate; but it will be understood that they are employed in pairs—one for each foot—the cranks of each skate being arranged to face one another.

In action a skate is attached to each foot of the operator and is secured in position by the toe and heel clips and the leg-strap. The operator will then proceed as though in ordinary walking, which action causes the foot-plate of each skate to alternately rise and fall and operate, through the medium of the connecting-rod 6, the crank 5 and rotate the sprocket-wheel 4, so giving motion, by means of the chain 13 and small sprocket 14, to the front or controlling wheel 11 and propelling the skates forward. The spiral springs 10 will allow of the free and easy up-and-down motion without any shock being transmitted from the foot-plate to the operator. The sleeves 8 will serve to keep the foot-plate always in a true horizontal position during action. The springs 10 10 will serve to return the foot-plate to its highest position. When pressure is relieved from it, they will further assist (by their push upon the plate) in operating the crank, thus facilitating the working of the skates. These springs must be proportioned in elastic strength to the weight of the rider in order to neutralize such portion of the rider's weight as is not necessary to work the machine when on ordinary roads. The back wheel is free in its bearings and may move into positions during travel at different angles to its frame, and so form the steering-wheel of the skate. The curved plates 40 form frictional plates which limit its position. The forward movement of the skater tends to hold the rear-wheel axle of each skate at the rear end of the slots 39; but when the foot is turned as desired and the front wheel driven in the manner described the rear wheel is free to turn the necessary extent, (which is slight,) one of the rounded ends of the axle serving as a pivot by bearing against the frame.

By means of my invention a great rate of travel is attainable, while the pace of the skate is readily controlled by the motion of the feet of operator, as in the operation of walking.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. A skate having in combination, a frame, a front controlling-wheel, a wheel 14 connected therewith, a rear wheel movable to different angles with the frame in use to steer the skate, a wheel 4 supported centrally in the frame, a chain between wheels 4 and 14, a crank for wheel 4, a connecting-rod 6, a vertically-guided foot-plate to which the upper end of rod 6 is connected, springs 10 normally holding the foot-plate up, and means for connecting the foot-plate to a foot.

2. A skate composed of two wheels, a frame in which the wheels are supported, a foot-plate, supporting-springs therefor, guides causing the foot-plate to move straight up and down, a crank operated by such movement, a sprocket-wheel or the like on the crank-spindle, means for communicating motion from the sprocket or the like to the front controlling-wheel, the rear wheel being the steering-wheel and having curved frictional plates 40.

3. A skate composed of two wheels, a frame forming bearings for said wheels, upright rods mounted on the frame forming guides for foot-plate, foot-plate-carrying sleeves encircling the upright rods, spiral springs encircling the rods and sleeves and supporting the foot-plate, and means for communicating motion from the foot-plate to the front controlling-wheel, the rear wheel being movable to different angles to the frame when in use, substantially as set forth.

4. A skate having in combination, a frame, wheels having bearings therein, uprights supported by the frame, foot-plates vertically and bodily guided by said uprights, springs 10 supporting the foot-plate, rod 6 pivoted to the foot-plate, crank 5 driven thereby, spindle 3, wheels 4, 14, the latter being on the front wheel, chain 13, the frame at the rear end having elongated slots, an axle 16 with flattened ends for the rear wheel with bearings in said slots and free to move to different angles to the frame when in use.

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

HENRY GLADE.

Witnesses:
A. O. SACHSE,
A. HARKER.