June 21, 1927. T. J. CONNOLLY 1,632,997

WHEEL SKATE

Filed Oct. 22, 1925

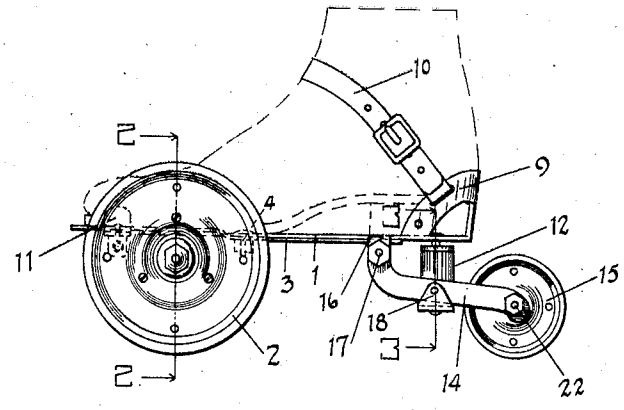



Fig 1

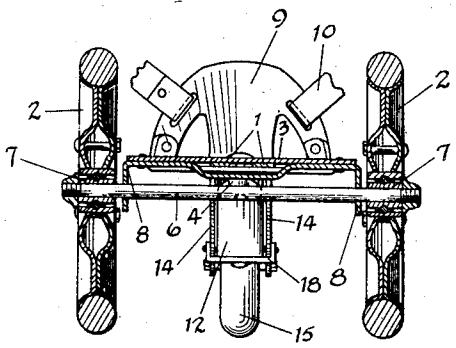



Fig 2

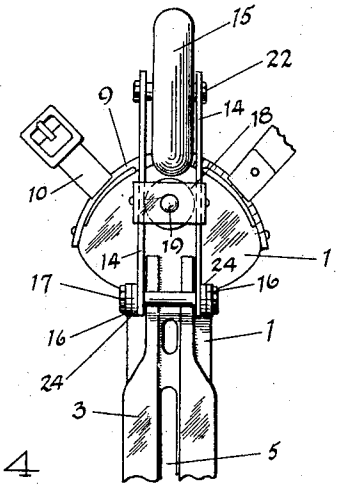



Fig 4

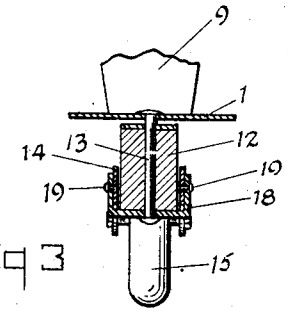



Fig 3

Inventor

Thomas J. Connolly

By Frank A. Crampton

Attorney

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# UNITED STATES PATENT OFFICE.

THOMAS J. CONNOLLY, OF TOLEDO, OHIO, ASSIGNOR TO THE HIKER MANUFACTURING COMPANY, OF TOLEDO, OHIO, A CORPORATION OF OHIO.

## WHEEL SKATE.

Application filed October 22, 1925. Serial No. 64,088.

My invention has for its object to provide an efficient wheel skate that may be made at a low cost of production and is so constructed as to be light in weight on the foot. The invention also has for its object to provide a means for cushioning the skate so that the shocks caused by irregularities of the surface over which the skate is moved will be quite entirely absorbed and hence will not be transmitted to the foot of the one using the skate. The invention also has for its object to provide a means whereby the natural movement of the skate will be controlled by the direction of the resultant of the pressures that are brought to bear on the skate so that the movement of the skate is controlled by the "balance" of the user of the skate whereby the skate will be caused to curve either inward or outward as may be desired and with curvatures that may be modified as may be desired by the skater.

The invention may be contained in cycle, roller or wheel skates of different forms and to illustrate a practical application of the invention I have selected a skate that contains the invention as an illustration of skates that embody the invention, and shall describe it hereinafter. The skate selected as illustrative of skates containing my invention is shown in the accompanying drawing.

Figure 1 is a side view of the wheel skate. Fig. 2 is an enlarged view of a section taken on the plane of the line 2—2 indicated in Fig. 1. Fig. 3 is an enlarged view of a section taken on the plane of the line 3—3 indicated in Fig. 1. Fig. 4 is an enlarged broken view showing the bottom of the rear portion of the skate.

The skate is provided with the usual main supporting plate 1. The wheels 2 are connected to the plate 3 which is adjustably connected to the plate 1 by means of the thumb screw 4 and the slots 5 formed in the plates 1 and 3. The wheels 2 are connected to the bar 6 and are rotatably supported thereon by means of the ball bearings 7 which permit substantially free rotation of the wheels 2 with respect to the skate. The plate 3 is provided with depending ears 8 in which the bar 6 is secured. The bar 6 is located, preferably, beyond the ball of the foot, that is, preferably, beneath the base of the toes of the user of the skate which locates the wheels 2 in such a position that the resultant of the pressures brought to bear upon the skate by reason of the weight of the user of the skate, will extend through a point in the skate that is located well to the rear of the line joining the centers of the wheels 2, that is, well to the rear of the axis of the bar 6, and the danger of being thrown forward is greatly eliminated notwithstanding the fact that the wheel 2 raises the height of the sole of the foot above the surface over which the skate is moved. Furthermore, this forward location enables a better stroke by reason of the fact that the toe of the foot may be used in producing the push forward in the stroke of the other skate of the user.

The skate is provided with the usual rear chair or heel plate 9 and a strap 10 may be used for securing the skate in position with reference to the foot. Clamps 11 of the type commonly used may be used for securing the skate to the toe of the boot or shoe worn by the user of the skate.

Beneath the center of the heel where the maximum pressure is produced is located a rubber cushion 12. The rubber cushion 12 may be a cylindrical block of soft rubber that is connected to the supporting plate 1 by means of the pin 13. A lever 14 is pivotally connected to the frame plate 1 at a point well in advance of the center of the heel. The lever extends downward and inclines to a point well to the rear of the skate where it is connected to the wheel 15. Preferably two levers 14 are used and are pivotally connected to ears 16 that are formed integral with the plate 1. They are pivotally connected to the ears 16 by means of the bolt 17. They are also pivotally connected to the stirrup 18 by means of the pins 19. The stirrup 18 supports the cushion 12 which extends to a point beneath the heel part of the plate 1 so that when the skate has been placed in position on the foot of the wearer the major part of the pressure of the user of the skate is supported by the cushion 12 which elastically transmits the pressure to the stirrup 17 which is connected to substantially the center of the levers 14. The plate 1 is elastic and consequently any shock that the wheel 15 may meet by reason of coming in contact with any impediment or slightly raised object or other obstruction will be absorbed by the compound cushioning effect produced by the

lever acting through the elasticity of the plate, particularly, that portion in the vicinity of the ears 16 to which the levers are connected, and the cushioning cylindrical rubber block. The arrangement thus provides a shock absorbing means which causes the user to experience an exceedingly smooth motion when using the skate.

The wheel 15 is a tired wheel, and of the same type as the wheels 2, though of smaller diameter. It is pivotally supported on the bar 22 which is connected to the outer ends of the levers 14. The levers 14 being connected to the stirrup 18 and the cylindrical block 12 having a considerable length compared to its diameter, the levers 14 will be located at a point considerably below, relatively speaking, the plate 1 at the point where they are connected with the stirrup 18. Resilient rubber washers 24 are located on the bolt 17 and between the levers 14 and the ears 16. The elasticity of the plate 1 and the washers 24 enable the skate to be tilted slightly with reference to the surface over which it is moved which causes the wheel 15 to be changed at a very slight angle from the longitudinal axis of the skate. When, therefore, the user desires to curve to the right, when gliding or moving on the right skate, he will by "throwing his weight" a little to the right of the longitudinal axis of the skate cause the wheel 15 to shift towards the right side of the longitudinal axis an exceedingly short distance and thus cause the skate to curve. This curvature may be increased according to the angle to which the leg of the user is moved relative to the surface over which he is gliding. The same is true with an in-curve whereby fancy strokes or straight away strokes finishing with an out-curve may be used. The latter stroke permits long glides and enables the skater to finish in a natural way to position his foot so that he can produce an effective push from the toe in making the subsequent stroke with the other skate. By the lever connection as between the rear wheel 15, the cushioned fulcrum of the levers and the resilient connection between the levers and the skate supporting plate, I have provided not only a shock absorbing means, but a means whereby the skate may be efficiently manipulated and used with ease through a long period of time without causing undue tiring while skating.

I claim:

1. In a wheel skate, a pair of wheels connected to the skate and located under the forward part of the skate, a wheel, a lever pivotally connected to the last named wheel and to the skate at a point intermediate the ends of the skate, the lever projecting rearwardly beyond the heel of the skate so as to locate the pivot of the last named wheel to the rear of the heel of the skate, a cushion means located intermediate the lever and the skate for resiliently connecting the last named wheel to the skate at a point well to the rear of the skate.

2. In a wheel skate, a main resilient supporting plate, a pair of wheels connected to the skate and located under the forward part of the skate, a wheel, a lever pivotally connected to the resilient supporting plate at a point intermediate the point of connection of the first named wheels and the heel of the skate and pivotally connected to the last named wheel, a cushion means located below the heel of the skate and intermediate the lever and the skate and between the pivot points of connection of the lever with the resilient plate and the last named wheel for resiliently supporting the rear end of the skate.

3. In a wheel skate, a main resilient supporting plate, a pair of wheels connected to the skate and located under the forward part of the skate, a wheel, the center of the last named wheel located well to the rear of vertical line passing through the rear end of the skate, a lever pivotally connected to the resilient supporting plate at a point intermediate the point of connection of the first named wheels and the heel of the skate and pivotally connected to the last named wheel, a cushion means located below the heel of the skate and intermediate the lever and the skate and between the pivot points of connection of the lever with the resilient plate and the last named wheel for resiliently supporting the rear end of the skate.

In testimony whereof I have hereunto signed my name to this specification.

THOMAS J. CONNOLLY.