





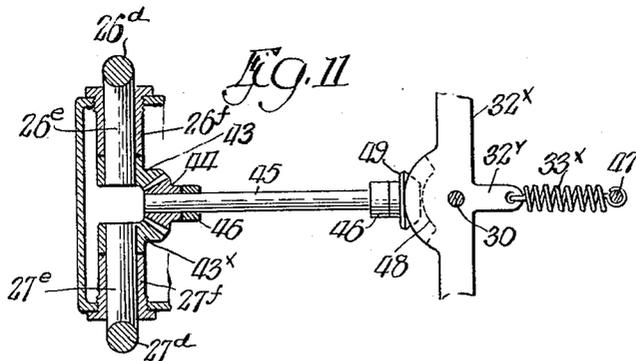
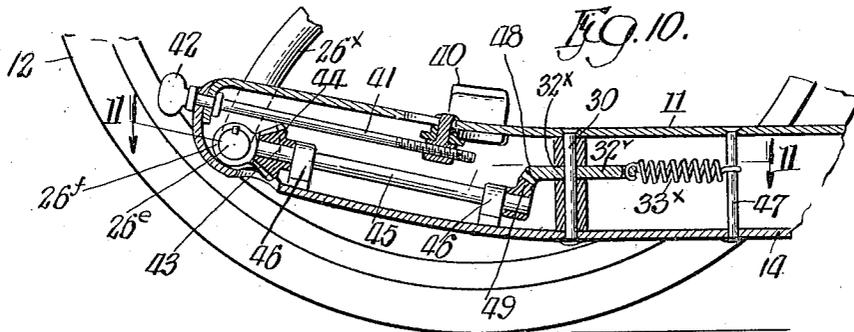
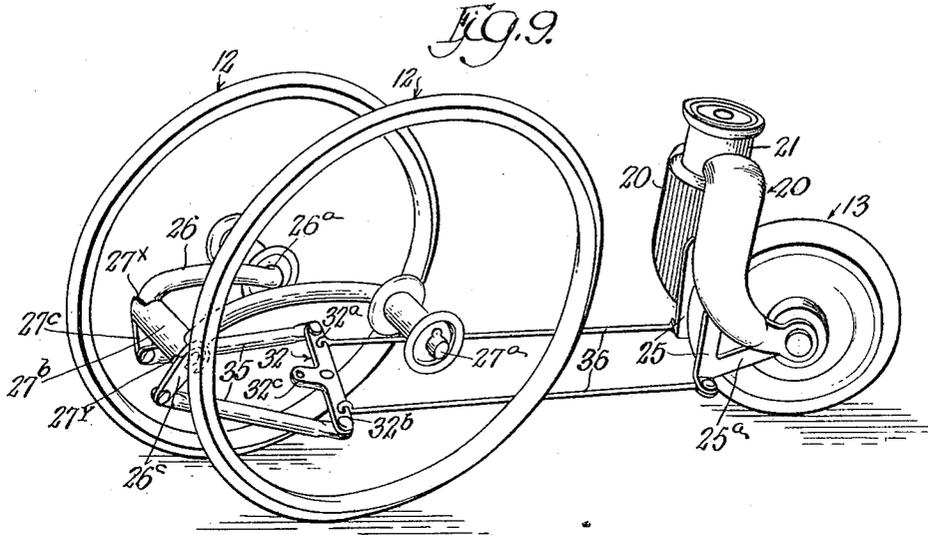
G. S. WEBB.  
SKATE.

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1,194,102.

Patented Aug. 8, 1916.

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# UNITED STATES PATENT OFFICE.

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## SKATE.

1,194,102.

Specification of Letters Patent.

Patented Aug. 8, 1916.

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*To all whom it may concern:*

Be it known that I, GEORGE S. WEBB, a citizen of the United States, and a resident of Aurora, in the county of Kane and State of Illinois, have invented certain new and useful Improvements in Skates; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in skates and consists of the matters herein-after described and more particularly pointed out in the appended claims.

One of the objects of the invention is to provide a skate in which the wheels may be made of comparatively large diameter. It is difficult to provide large wheels on roller skates as now ordinarily made because the foot plate is located above the axes of the wheels and the size of the wheels is thus necessarily limited, since any increase in the diameter of the wheels necessitates the raising of the foot plate so far above the ground as to make the use of the skates awkward. In the improved skate the foot plate is placed below the axes of the wheels and is so connected to the wheels that the diameter of said wheels may be increased within limit to any extent without raising the foot plate above the desired position in close proximity to the ground.

Another object of the invention is to so connect the wheels and the foot plate that the planes of the wheels will shift with the shifting of the weight on the foot plate so that the weight of the skater is always exerted on the skate in a line parallel to said planes. As a result of this arrangement, light wheels may be used without danger of buckling or collapsing, since little or no side strains are produced on the wheels in the shifting of the skater's weight. As a result of this, larger wheels may be used without materially adding to the weight of the skate.

Another object of the invention is to provide a skate with the front wheels set wide apart and the rear wheel back of the heel of the skater so that a large base both as to lateral and longitudinal extent is provided, thus adding to the stability and easy balance of the skater.

These and various other advantages of my improved skate will appear more clearly as I proceed with my specification.

Referring now to the drawings: Figure 1 is a view representing a side elevation of my skate. Fig. 2 is a view representing a top plan view of the improved skate. Fig. 3 is a view representing on an enlarged scale a partial vertical section through the skate in a plane indicated by the line 3—3 of Fig. 2. Fig. 4 is a view representing a transverse vertical section through the skate, on the scale of Fig. 3 in a plane indicated by the line 4—4 of Fig. 2. Fig. 5 is a view on an enlarged scale representing a transverse vertical section through Fig. 2 in a plane indicated by the line 5—5 of Fig. 2. Fig. 6 is a perspective view of one of the supporting arms by means of which the front wheels of the skate are connected to the foot plate. Fig. 7 is a view representing a transverse vertical section through Fig. 1 in a plane indicated by the line 7—7 of Fig. 1. Fig. 8 is a perspective view of a T-lever arm used in the construction of the skate. Fig. 9 is a diagrammatic perspective view of the skate with the foot plate and other parts omitted for convenience in illustrating, the skate being shown in the position the wheels occupy when turning a corner, looked at from a point a little in front of the skate. Fig. 10 is a view representing a modified form of certain parts of the skate to be referred to more particularly later. Fig. 11 is a detail sectional view through Fig. 10, the plane of the section being indicated by the line 11—11 thereof.

Referring now to that embodiment of my invention illustrated in the drawings—11 indicates the foot plate of the skate, that is to say, the plate upon which the skater's foot bears and by means of which the skate is attached to the foot.

12—12 indicate a pair of front wheels and 13 indicates a single rear wheel. The wheels of the skate are arranged in the manner of the old fashioned tricycle except that the wheels are reversed,—the small, steering wheel being located at the rear of the skate and the larger wheels being located at the front of the skate. The foot plate 11 is braced by means of a round shell 14, which extends from the front end to the rear end of the foot plate and is arranged symmet-

rically with regard to the longitudinal central axis of the foot plate. Said shell is diminished in lateral and vertical dimensions at the toe of the foot plate and it is there provided with an extension 14<sup>a</sup> which is bent in the arc of a circle and riveted to the top of the foot plate. The foot plate has a longitudinal extension 11<sup>a</sup> at its front end, which is bent downwardly in the arc of a circle and the two extensions, namely, the extension 14<sup>a</sup> of the shell and the extension 11<sup>a</sup> of the foot plate, together form a bearing for a purpose presently to be described. The rear end of the foot plate is bent up to form a heel abutting clip or flange 16.

17 indicates a plate consisting of upright laterally spaced members 17<sup>a</sup>, 17<sup>a</sup>, fixed at their bottom ends to the shell 14 and of a horizontally curved strap part 17<sup>b</sup>, which joins the two lateral members 17<sup>a</sup>, 17<sup>a</sup>. The strap member 17<sup>b</sup> is adapted to pass back of and in contact with the heel of the skater at a point above the heel clip or flange 16. The member 17 is braced and held in proper position with reference to the foot plate by means of a bent tubular bar 18, having flat ends 18<sup>a</sup> that are fixed to the shell 14. Said tubular bar is so bent as to provide a support for the sides and rear of the skater's heel.

The strap 17<sup>b</sup> has rearwardly projecting, vertically spaced horizontal extensions 19, 19 which provide bearing for a fork 20 in which is mounted the rear wheel 13. Said fork is connected to said bearing plates in the familiar manner of a caster and as shown has a head 21 located between the extension plates 19, 19 and bearing on a vertical bolt 22, extending through said plates. A nut and washer 23 secures the bolt in position. Ball races and balls 24 are preferably interposed between the head and the plates 19 in the usual way in order to provide an anti-friction bearing. The arms of the fork 20 are preferably tubular in construction to provide a maximum of strength with a minimum of weight.

25, 25 indicate vertical steering arms fixed to the arms of the fork and preferably having bracing parts 25<sup>a</sup> which extend rearwardly and upwardly and are engaged on the rear wheel axle. By the construction described, the fork of the wheel is made capable of an easy swinging motion about a vertical axis and the rear end of the foot plate is hung below the axis of the rear wheel.

The foot plate is hung below the front wheels 12, 12 by the following construction.

26, 27 indicate arms which have horizontal axle parts 26<sup>a</sup>, 27<sup>a</sup>, upon which the respective front wheels are rotatively mounted in any familiar manner and horizontal journal arms 26<sup>b</sup>, 27<sup>b</sup>, which are spaced forwardly from and below the aforesaid axle parts. One of said journal arms (in the case illus-

trated, the arm 27<sup>b</sup>), is tubular and has bearing in the heretofore mentioned bearing provided by the extensions 14<sup>a</sup> and 11<sup>a</sup> at the front end of the foot plate 11. The other journal arm (in this case the journal arm 26<sup>b</sup>) is a round bar which extends through and has bearing in the first named tubular journal arm 27<sup>b</sup>. At the end of the tubular journal arm 27<sup>b</sup> is fixed a depending arm 27<sup>c</sup> and at the end of the journal arm 26<sup>b</sup> is fixed a depending arm 26<sup>c</sup>. Said two arms 27<sup>c</sup> and 26<sup>c</sup> are normally in the same vertical plane and are each in line with one of the steering arms 25 on the rear wheel when the skate is in normal position.

It will be noted that the depending arms 26<sup>c</sup>, 27<sup>c</sup> of the arms 26, 27, are in line with the steering arm 25 of the rear wheel, which is on a side of the longitudinal axis of the skate opposite the side of the front wheel with which said arm 26 or 27 is connected.

Near the front end of the foot plate on the bottom there is fixed in the longitudinal median line of the foot plate a vertical pin 30. Said pin is fixed at its top end in the foot plate and at its bottom end in the strengthening shell 14. A T-lever 32 is journaled in a horizontal plane on said pin 30 in a position between the bottom of the foot plate and the shell, said T-lever being held in place between spacing sleeves 31. Said T-lever has right and left arms 32<sup>a</sup>, 32<sup>b</sup>, and a forwardly extending short arm 32<sup>c</sup>. The latter arm 32<sup>c</sup> is connected by a contractile coiled spring 33 with a fixed part 34 on the strengthening shell 14 located near the toe of the foot plate. The said shell is cut away to leave room for the forward part of the spring 33 and the cut away part as shown, is bent down in the form of a lug which provides a fixed part of the shell to which the forward end of the spring is connected. The spring 33 acts to normally hold the right and left arms 32<sup>a</sup>, 32<sup>b</sup> in a line at right angles to the length of the foot plate 11. The right and left arms 32<sup>a</sup>, 32<sup>b</sup> of the T-lever are connected respectively by links 35, 35 with the depending arms 26<sup>b</sup>, 27<sup>b</sup> of the front wheel axle arms. Said right and left arms 32<sup>a</sup>, 32<sup>b</sup> are also connected at points just within each of the points of connection for the links 35 by means of links 36, 36 to the steering arms 25, 25, on the fork arms of the rear wheel.

Any convenient means is provided for attaching the foot plate to the foot of the skater. As shown, rear straps 38 with an associated buckle are attached to the upright lateral members 17<sup>a</sup> of the rear plate 17. At the toe of the foot plate are provided the familiar clamp arms 40, 40 operatively connected to the bottom of the foot plate in any convenient manner and arranged to be actuated by a screw bolt 41 extending longitudinally of the foot plate

and projecting beyond the front end thereof. A fly nut 42 on the end of the screw bolt may be used for drawing up the clamp arms.

5 The operation of the improved skate is as follows: In the normal position of the skater with the full weight of the skater exerted in a vertical line on the skate, the two front wheels and the rear steering wheel are  
10 all in vertical planes with their axes horizontal and extending in directions at right angles to the longitudinal central axis of the foot plate. When in the movement of the skater as when going about a curve, the  
15 weight of the skater is exerted in a line inclined to the vertical, the front wheels 12 will assume positions in planes parallel to the said vertical line, this position being brought about by the position of the arms  
20 26, 27 in communicating the weight of the skater from the foot plate 11 to the front wheels. The shifting of the wheels from their vertical position to the said inclined position, as clearly illustrated in Fig. 9, will communicate a relative rocking movement to the arms 26, 27, in exact proportion to the inclination of the shifting of the weight line of the skater from the vertical to the inclined position and this rocking  
30 movement will be communicated through the links 35, 35 to the T-arm 32, thereby shifting said arm from its normal position. The movement of the T-arm will be communicated by the links 36, 36 to the rear steering arm 25, 25 so as to swing the fork of the rear wheel toward that side of the longitudinal central axis of the foot plate to which the foot plate itself has been shifted in the shifting of the line of weight of the skater. As a result of this movement, the front wheel at the side of the skate, on which the weight of the skater is exerted is brought to a position somewhat forward of its normal position and the other front  
45 wheel is brought to a position somewhat to the rear of its normal position. Thus the wheels, while all located in planes parallel to the line in which the weight of the skater is exerted, will act to steer the skate in the curved path in which the skater desires to go.

It will be manifest that the movements described will be in exact proportion to the shifting of the weight of the skater. A  
55 shifting of the weight of the skater in the opposite direction will manifestly produce a reverse movement of the parts.

When the skate is lifted from the ground, manifestly the coiled spring will restore the  
60 T-arm to its normal position, so that both the front wheels and the rear wheel will be returned to their normal positions. When the skate is again brought to bear on the ground, the wheels will assume the positions required of them by the direction in

which the weight of the skater is exerted on the skate.

In order to prevent the skate from turning too far in one direction or the other, the sleeve 27<sup>b</sup> is provided on one side at the end  
70 into which the solid journal arm 26<sup>b</sup> of the other arm enters with annular spaced shoulders 27<sup>x</sup>, 27<sup>x</sup>, against which the arm is adapted to engage to limit the swinging movement of said arm in its journal. The  
75 other end of said sleeve is provided with similar shoulders 27<sup>y</sup>, which are adapted to be engaged by the depending arm 26<sup>c</sup> under like circumstances. These shoulders prevent the skate from shifting to one side or the other beyond such limits as would permit the skate to collapse in its sidewise movement.

The shifting of the steering gear in the manner above described is brought about by the shifting of the horizontal axle parts of the arms 26, 27, connected with the front wheels, as has been before stated. When the inner end of the axle part of one front wheel is lowered, the inner end of the axle part of the other wheel is proportionately raised. The depending arm 27<sup>c</sup> or 26<sup>c</sup> connected with the axle part, the inner end of which is lowered, is shifted forwardly and the one connected with the axle part, the inner end of which is raised, is shifted rearwardly. Manifestly other means than that shown for communicating the resulting relative forward and backward movement to the T-bar 32 may be used and in Figs. 10 and  
100 11 I have shown a very simple modification by means of which this movement may be imparted. In said figures 26<sup>d</sup>, 27<sup>d</sup> indicate the arms connected with the front wheels and 26<sup>e</sup>, 27<sup>e</sup> indicate the journal parts of said arms. Said journal parts, however, in this case, instead of providing mutual bearing for each other, have separate bearings provided by thimbles 26<sup>f</sup>, 27<sup>f</sup>, which are threaded into the sides of the reinforcing  
110 shell of the foot plate. The journal parts 26<sup>e</sup>, 27<sup>e</sup>, terminate short of the longitudinal central axis of the foot plate and have fixed to them beveled gear parts 43, 43<sup>x</sup>, respectively, which engage with an intermediate  
115 beveled gear 44. Said intermediate beveled gear is fixed to the forward end of a longitudinal shaft 45 that has rotative bearing in lugs 46, 46 fixed to the reinforcing shell. 32<sup>x</sup> indicates the T-arm in this case which is connected as before to the rear steering arm 25. Said T-arm has a short middle arm 32<sup>y</sup> as before, but in this case said arm extends rearwardly and is connected by a coiled  
120 spring 33<sup>x</sup> to a pin 47 fixed to the foot plate and to the shell. Said spring acts as before and maintains the T-arm with its right and left arms in line normally at right angles to the longitudinal axis of the foot plate.

On the forward part of the T-arm is pro- 130

vided an arcuate rack 48 and said rack is engaged by a beveled pinion 49 fixed to the rear end of the shaft 45.

Manifestly when the axle parts of the wheels are shifted as before described, one of the axle parts 26<sup>e</sup>, 27<sup>e</sup>, will be rotated in one direction, while the other axle part 27<sup>e</sup>, will be rotated in the opposite direction as before, with the result that a rotative movement in one direction or the other is imparted to the shaft 45 and said shaft, through the pinion 49 and the arcuate rack 48 impart a proportional swinging movement to the T-arm 32<sup>x</sup>.

I claim as my invention:—

1. In a skate, in combination with a foot plate, a pair of front wheels and rear wheels below the axes of which said foot plate is located, means suspending said foot plate from said front wheels, said means being constructed to maintain said front wheels in a plane parallel to the direction of weight imposed upon said foot plate and means connecting said front wheels with said rear wheel whereby the skate is steered by said rear wheel.

2. In a skate, the combination of a foot plate, a pair of large front wheels and a smaller rear wheel, said foot plate being suspended below the axes of all of said wheels, means providing a pivotal connection between said rear wheel and said foot plate, means suspending said foot plate from said front wheels whereby the axes of said front wheels will always be maintained parallel to a transverse line of said foot plate, and means operatively connecting the suspension means of said front wheels with said rear wheel, whereby said skate is steered.

3. In a skate, the combination with a foot plate, a pair of large front wheels and a

single smaller rear wheel, said foot plate being supported below the axes of all of said wheels, a fork carrying said rear wheel pivoted on a vertical axis at the rear of said foot plate, arms for suspending the front end of said foot plate from said wheels, said arms having axle parts and coaxial journal parts, the latter being journaled to said foot plate, and means operatively connecting said arms with the fork of said rear wheel, whereby said skate is steered.

4. In a skate, the combination with a foot plate, a pair of large front wheels and a single smaller rear wheel, said foot plate being supported below the axes of said wheels, a fork carrying said rear wheel, means connecting said fork with said foot plate providing for a swinging movement of said fork on a vertical axis, arms by means of which the front end of said foot plate is suspended from said front wheels, said arms including axle parts on which said front wheels are mounted, and coaxial journal parts operatively connected with said foot plate, means operatively connecting said arms with said rear fork, whereby the shifting movement of said arms in the shifting of the weight of the skater on the foot plate is communicated to the fork of said rear wheel, and a device for normally maintaining said rear wheel in line with the longitudinal center axis of said foot plate.

In testimony, that I claim the foregoing as my invention I affix my signature in the presence of two witnesses, this 29th day of June, A. D. 1915.

GEORGE S. WEBB.

Witnesses:

T. H. ALFREDS,  
KARL N. DOLL.