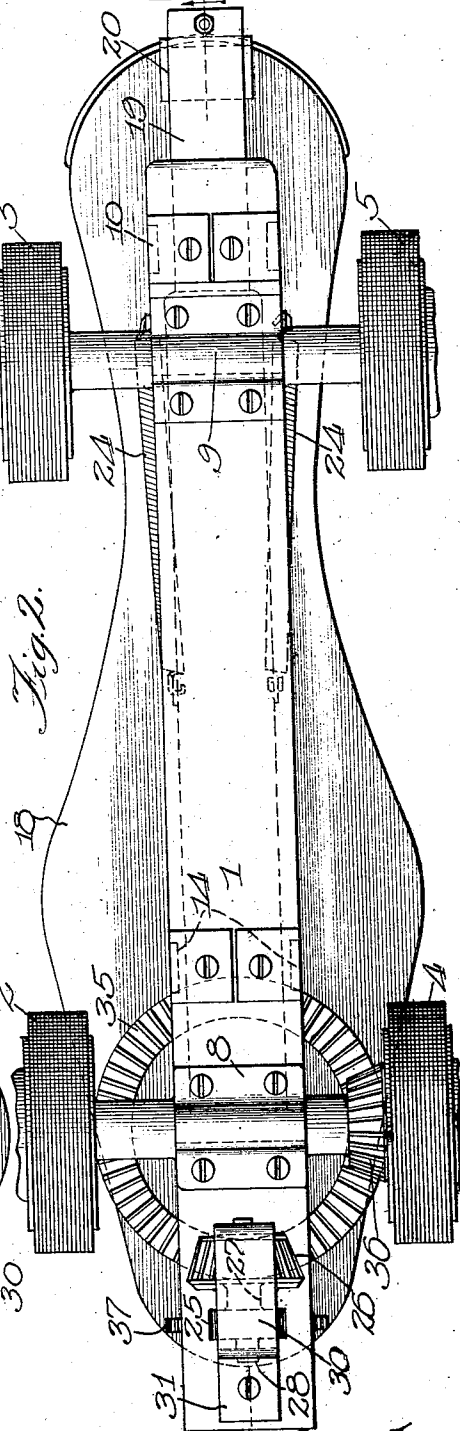
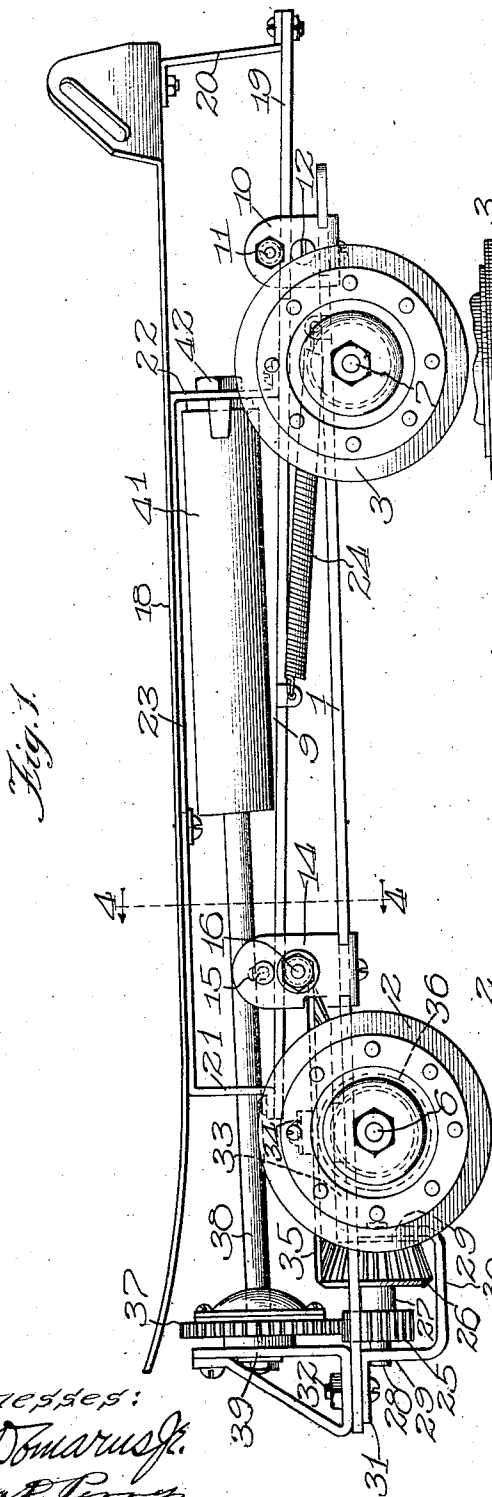


H. NANNENHORN.
 ROLLER SKATE.
 APPLICATION FILED JUNE 26, 1911.

1,008,187.

Patented Nov. 7, 1911.

3 SHEETS-SHEET 1.



Witnesses:
H. D. Marus
J. P. Perry

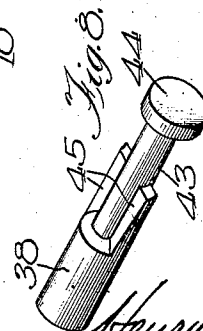
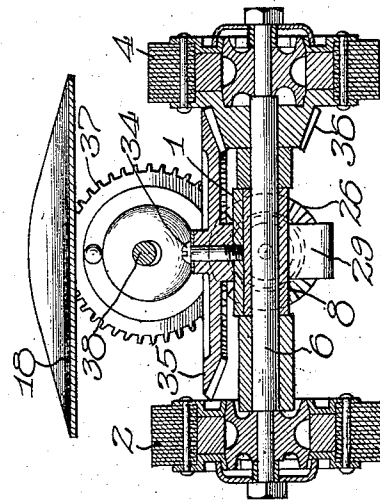
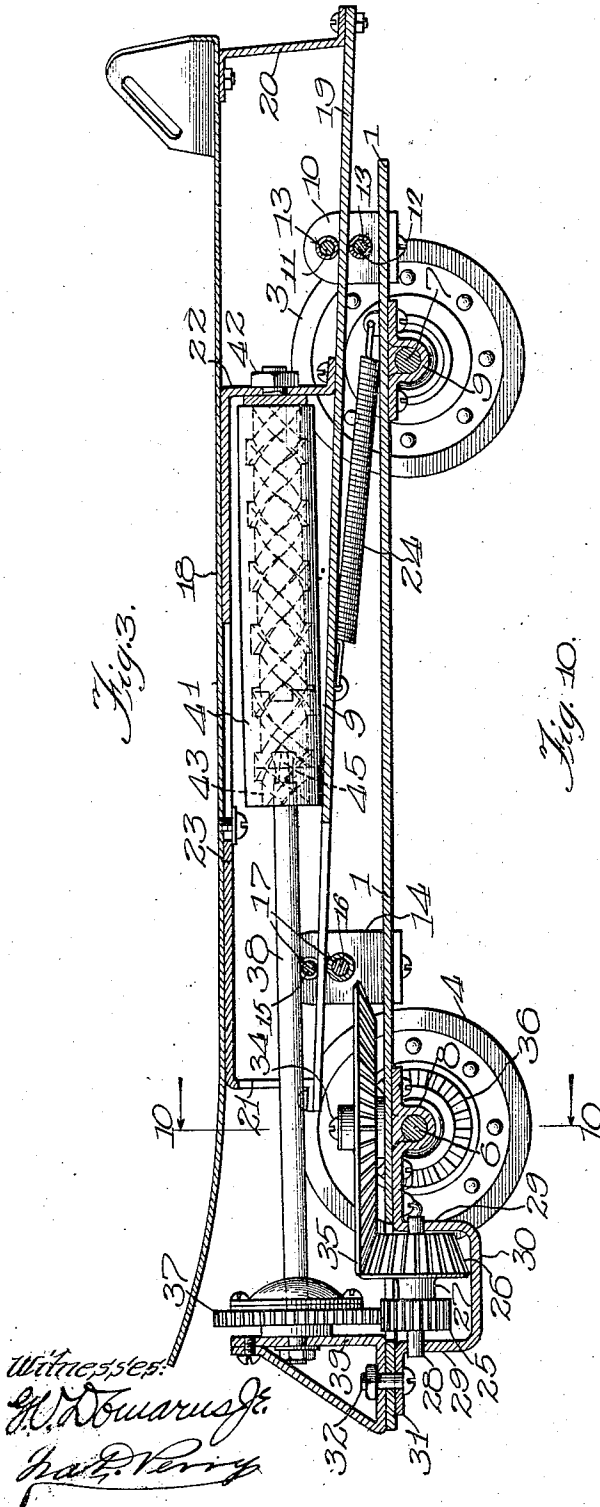
Inventor:
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3 SHEETS—SHEET 2.

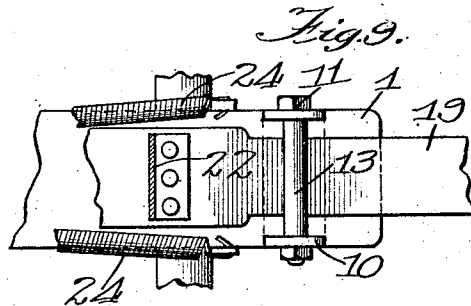
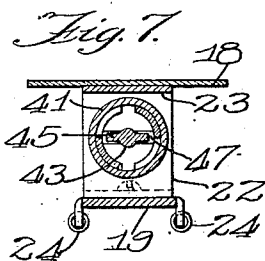
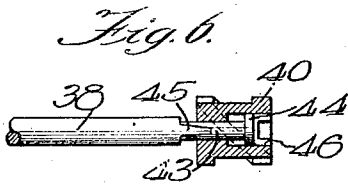
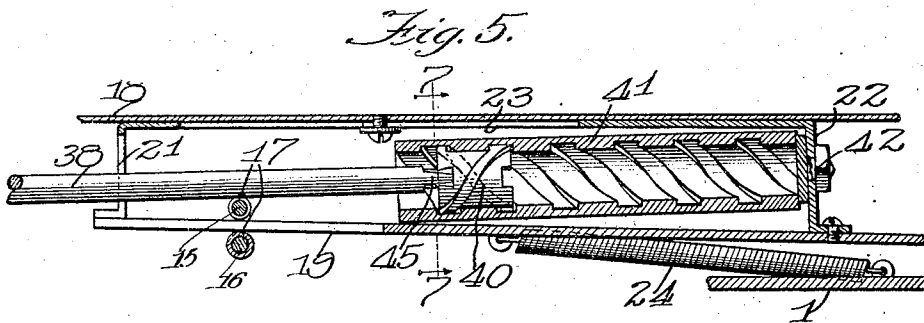
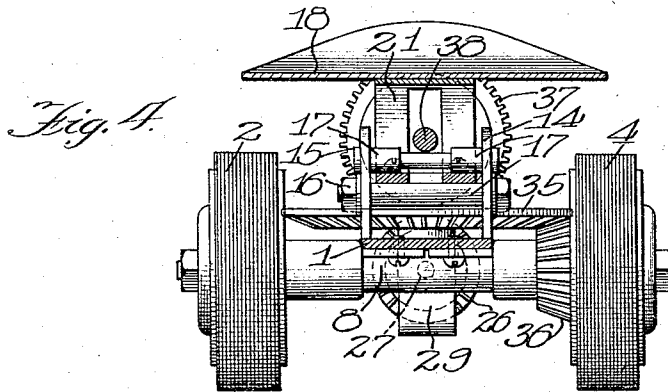


Inventor:
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 ROLLER SKATE.
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Patented Nov. 7, 1911.
 3 SHEETS—SHEET 3.



Witnesses:
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 By: [Signature]
 Att'y.

UNITED STATES PATENT OFFICE.

HENRY NANNENHORN, OF CHICAGO, ILLINOIS.

ROLLER-SKATE.

1,008,187.

Specification of Letters Patent.

Patented Nov. 7, 1911.

Application filed June 26, 1911. Serial No. 635,394.

To all whom it may concern:

Be it known that I, HENRY NANNENHORN, citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Roller-Skates; 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.

This invention has for its object to provide an improvement in roller skates.

The invention consists in the features of construction and combinations of parts of the skate hereinafter fully described and claimed.

In the accompanying drawings illustrating a suitable embodiment of the invention: Figure —1— is a side elevation of a roller skate constructed in accordance with my invention. Fig. —2— is a bottom plan view of the same. Fig. —3— is a central vertical longitudinal section of the same on the line 3—3 of Fig. —2—. Fig. —4— is a vertical transverse section of the same on the line 4—4 of Fig. —1—. Fig. —5— is a fragmentary detail central longitudinal section of the same showing mechanism for converting reciprocal movement of the foot plate into rotary motion of one of the front rollers of the skate. Fig. —6— is a fragmentary detail section showing the connection of a shaft with a threaded member for rotating said shaft in one direction. Fig. —7— is a fragmentary detail transverse section on the line 7—7 of Fig. —5—. Fig. —8— is a fragmentary detail perspective view of one end of the shaft. Fig. —9— is a fragmentary detail horizontal section on the line 9—9 of Fig. —1—. Fig. —10— is a vertical transverse section on the line 10—10 of Fig. —3—.

My invention has for its particular object to provide means whereby a primary impetus is given to one of the rollers supporting the skate as the latter is brought on the floor at each stroke of the foot of the wearer whereby greater speed in skating may be attained.

The mechanism illustrated in the accompanying drawings is adapted to carry out the object of the invention and will now be described.

The skate comprises a carriage consisting

of the plate 1 which is supported upon a plurality of caster wheels 2, 3, 4 and 5, the latter being rotatably mounted on the axles 6 and 7 suitably mounted upon said plate 1 adjacent the respective ends thereof by means of the flanged plates 8 and 9 respectively. The said plate 1 is provided adjacent its rear end with a pair of parallel opposed standards 10 which are spanned by bolts 11 and 12, each of which carries a rotatable sleeve 13. A similar pair of opposed standards 14 is mounted upon the forward end portion of said plate 1, said standards being similarly spanned by bolts 15 and 16 carrying rotatable sleeves 17, the latter being disposed at a higher elevation relatively to the horizontal plane of the plate 1 than are the bolts 11 and 12 of the standards 10.

The foot plate 18 of the skate is mounted upon a plate 19 by means of the standards 20, 21 and 22 respectively; the said standards 21 and 22 constituting the arms of an inverted U-shaped plate 23 which is secured at its middle portion to the plate 18. The said plate 19 is supported upon the sleeves or rollers 13 and 17 mounted upon the bolts 12 and 16 respectively, and is reciprocally movable relatively to the plate 1. Helical tension springs 24 serve to maintain the said plate 19 normally at the rearward limit of its movement relatively to the plate 1, and, owing to the angular disposition of said plate 19 relatively to the plate 1, the weight of the wearer of the skate will serve to cause said plate 19 to normally move to the rearward limit of its movement by the gravity pressure imparted thereto.

The plate 1 is provided in its forward end portion with an opening through which a spur pinion 25 and bevel pinion 26, respectively, are adapted to project, the latter being rigid with a sleeve 27 mounted upon a shaft or pin 28 journaled at its ends in the vertical arms 29 of a U-shaped member 30 secured at one end to the lower face of the plate 1 by means of a flange 31 and bolt 32, and at its other end to the top face of said plate 1 by means of the flange 33 projecting through said opening therein. Rotatably mounted upon a stud 34 carried by said plate 1 and disposed in vertical alinement with the axle 6 is a bevel gear 35 which meshes with said bevel pinion 26 and with a bevel pinion 36 rigid with the caster wheel 4. The said spur pinion 25 meshes with a

spur gear 37 rigidly mounted upon one end of a shaft 38 extending longitudinally of the skate substantially parallel with the plate 1; said shaft 38 being journaled at one end in a standard 39 mounted upon the forward end of the plate 1 and secured by means of said bolt 32, the other end thereof being engaged by an externally threaded sleeve 40, shown in detail in Fig. —6—. The said threaded sleeve 40 is contained in an internally threaded or helically grooved sleeve 41 which is secured at one end by means of the nut 42 to the standard 22 and is non-rotatable relatively thereto, said sleeve being adapted during the reciprocal movement of the plate 18 relatively to the plate 1 and shaft 38 to rotate said sleeve 40 in a well-known manner. The end portion of said shaft 38 engaged in said sleeve 40 is provided with a projection 43 of smaller diameter than, but integral with, said shaft 38, and is equipped with a head 44 of the same diameter as the body of said shaft; said head 44 being mounted upon the reduced end portion 43 of said shaft in any suitable manner, no attention having been paid to this detail of construction in illustrating the device. At diametrically opposite points on said reduced end portion 43 of said shaft are tapered projections 45 extending from the body of the shaft 38 toward said head 44. The sleeve 40 is provided with a central opening 46 corresponding substantially in diameter with the head 44 and adapted to receive the same, one end portion of said central opening 46 being reduced in diameter to receive the reduced end portion 43 of said shaft. In the end of said sleeve opposing the projections 45 is a diametrically disposed recess 47 extending radially from either side of the reduced end portion of the opening 46 therein; said slot or recess 47 being adapted to receive said projections 45 to hold the shaft 38 and sleeve 40 against relative rotation. The depth of the enlarged portion of said opening 46 and the length of the reduced end portion 43 of the shaft are respectively such as to permit said sleeve 40 a limited longitudinal movement relative to the shaft 38 sufficient to permit the projections 45 to be completely withdrawn from said slot 47 whereupon said sleeve 40 will be rotatable relatively to said shaft 38 and vice versa. Thus when the plate 18 is moved reciprocally relatively to the plate 1 toward the front end of the latter the sleeve 40 will be rotated by said sleeve 41 in one direction and during the movement of said sleeve 41 in said direction the sleeve 40 will be moved in the same direction relatively to the shaft 18 so as to engage the projections 45 of the latter in the slot 42. As this has been accomplished the sleeve 40 will be incapable of rotation relatively to the shaft 38 and incapable of further forward movement

relatively to the same so that the further forward movement of the sleeve 41 will impart rotary movement to said sleeve 40 and consequently to the shaft 38. Such rotary movement of the shaft 8 will be imparted to the caster wheel 4 through the intermediacy of said gear train heretofore described, thus rotating said roller at greater speed than said shaft 38, as will be obvious, and at greater speed than said roller would ordinarily be rotated by contact with the floor and movement by the foot of the wearer on the floor, the speed of travel of the skate on the floor during the primary stroke of the foot of the wearer thereof being thus accelerated and enabling the wearer to attain a greater speed in skating. The said gear train may obviously be changed and varied to impart any desired relative number of rotations to the caster wheel relatively to the shaft 38 within certain limits, as will be obvious.

After giving the primary impetus to the skate by movement of the plate 18 relatively to the plate 1 in one direction a gradual reverse movement of the former relatively to the latter will take place owing to the tension exerted upon the plate 18 by the springs 24 and further by the action of gravity as heretofore described so that while a rapid relative longitudinal movement of the plates 1 and 18 takes place as the foot of the wearer of the skate is placed upon the floor a gradual reverse movement of said plates relatively to each other takes place during the balance of the stroke whereby the said plates are returned to their normal relative positions preparatory to making the next stroke. It will be noted that as the sleeve 41 moves rearwardly relatively to the shaft 38 the sleeve 40 will also be primarily moved rearwardly so as to disengage the projections 45 from the slot 47 after which said sleeve 40 will rotate relatively to the sleeve 41 and shafts 38 in the opposite direction without effecting a free rotation of said shaft due to its gearing with the roller 4.

My invention is relatively simple and efficient and is designed more particularly for use in racing or other fast skating.

I claim as my invention:

1. In a roller skate, a carriage supported on the rollers, a shaft rotatably mounted on said carriage, gearing between the same and one of said rollers, a foot plate reciprocally movable on said carriage, and means actuated by relative movement of said foot-plate and said carriage in one direction for imparting rotary movement to said shaft.
2. In a roller skate, a carriage supported on the rollers, a shaft rotatably mounted on said carriage, gearing between the same and one of said rollers, a foot plate reciprocally movable on said carriage, a helically grooved cylinder carried by said foot-plate, a mem-

ber provided with a helical rib rotatably mounted on said shaft and adapted to be rotated by reciprocal movement of said foot-plate relatively to said carriage, said shaft and said ribbed member provided with interengaging means for holding the same against relative rotation, whereby the reciprocal movement of said foot-plate imparts rotary movement to said shaft.

10 3. In a roller skate, a carriage supported on the rollers, a shaft rotatably mounted on said carriage, gearing between the same and one of said rollers, a foot plate reciprocally movable on said carriage, a helically grooved cylinder carried by said foot-plate, a member provided with a helical rib rotatably mounted on said shaft and adapted to be rotated by reciprocal movement of said foot-plate relatively to said carriage, said member longitudinally movable on said shaft, a head on said shaft, projections on said shaft, said head and projections limiting the longitudinal movement of said member on said shaft, said member provided with recesses to receive said projections to hold the same against rotation relatively to said shaft, said sleeve adapted to impart longitudinal movement to said member to throw the latter into and out of engagement with said projections, whereby when said foot-plate moves relatively to said carriage in one direction said shaft will be rotated.

4. In a roller skate, a carriage supported on the rollers, a shaft rotatably mounted on said carriage, gearing between the same and one of said rollers, a foot-plate reciprocally movable on said carriage, springs normally maintaining said carriage and said foot-plate at one limit of their relative movement, a helically ribbed member carried by said shaft, means for engaging the same with said shaft and holding it against movement relatively thereto in one direction, a sleeve rigid with said foot plate and provided internally with helical ribs adapted to engage the helical ribs of said ribbed member on said shaft for rotating the same and said shaft in one direction whereby when said foot plate moves in one direction relatively to said carriage rotary movement is imparted to said shaft in one direction.

5. In a roller skate, a carriage supported on the rollers, a shaft rotatably mounted on said carriage, gearing between the same and one of said rollers, a foot-plate reciprocally movable on said carriage, springs normally maintaining said carriage and said foot-plate at one limit of their relative movement, a helically grooved cylinder carried by said foot-plate, a member provided with a helical rib rotatably mounted on said shaft and adapted to be rotated by reciprocal movement of said foot-plate relatively to said carriage, said shaft and said ribbed member provided with interengaging means

for holding the same against relative rotation in one direction, whereby the reciprocal movement of said foot-plate imparts rotary movement to said shaft in one direction.

6. In a roller skate, a carriage supported on the rollers, a shaft rotatably mounted on said carriage, gearing between the same and one of said rollers, a foot-plate reciprocally movable on said carriage, springs normally maintaining said carriage and said foot-plate at one limit of their relative movement, a helically grooved cylinder carried by said foot-plate, a member provided with a helical rib rotatably mounted on said shaft and adapted to be rotated by reciprocal movement of said foot-plate relatively to said carriage, said member longitudinally movable on said shaft, a head on said shaft, projections on said shaft, said head and projections limiting the longitudinal movement of said member on said shaft, said member provided with recesses to receive said projections to hold the same against rotation relatively to said shaft, said sleeve adapted to impart longitudinal movement to said member to throw the latter into and out of engagement with said projections, whereby when said foot-plate moves relatively to said carriage in one direction said shaft will be rotated.

7. In a roller skate, a carriage supported on the rollers, a shaft rotatably mounted on said carriage, gearing between the same and one of said rollers, a plate angularly disposed relatively to the plane of said carriage, anti-friction rollers on said carriage on which said plate is reciprocally movable relatively to said carriage, a foot-plate carried by said plate, and means actuated by relative movement of said foot-plate and said carriage in one direction for imparting rotary movement to said shaft.

8. In a roller skate, a carriage supported on the rollers, a shaft rotatably mounted on said carriage, gearing between the same and one of said rollers, a plate angularly disposed relatively to the plane of said carriage, anti-friction rollers on said carriage on which said plate is reciprocally movable relatively to said carriage, a foot-plate carried by said plate, springs normally maintaining said plate and said carriage at one limit of their relative movement, and means actuated by relative movement of said foot-plate and said carriage in one direction for imparting rotary movement to said shaft.

9. In a roller skate, a carriage supported on the rollers, a shaft rotatably mounted on said carriage, gearing between the same and one of said rollers, a plate angularly disposed relatively to the plane of said carriage, anti-friction rollers on said carriage on which said plate is reciprocally movable relatively to said carriage, a foot-plate carried by said plate, and means actuated by

relative movement of said foot-plate and said carriage in one direction for imparting rotary movement to said shaft.

10. In a roller skate, a carriage supported
5 on the rollers, a shaft rotatably mounted on said carriage, gearing between the same and one of said rollers, a plate angularly disposed relatively to the plane of said carriage, anti-friction rollers on said carriage
10 on which said plate is reciprocally movable relatively to said carriage, a foot-plate carried by said plate, a helically grooved cylinder carried by said foot-plate, a member provided with a helical rib rotatably mounted
15 on said shaft and adapted to be rotated

by reciprocal movement of said foot-plate relatively to said carriage, said shaft and said ribbed member provided with interengaging means for holding the same against relative rotation in one direction, whereby
20 the reciprocal movement of said foot-plate imparts rotary movement to said shaft in one direction.

In testimony whereof I have signed my name in presence of two subscribing witnesses.
25

HENRY NANNENHORN.

Witnesses:

MAE M. BOYLE,

RUDOLPH W. M. LOTZ.