July 11, 1939. G. S. CHILES 2,165,996

SKATE

Filed Feb. 12, 1937

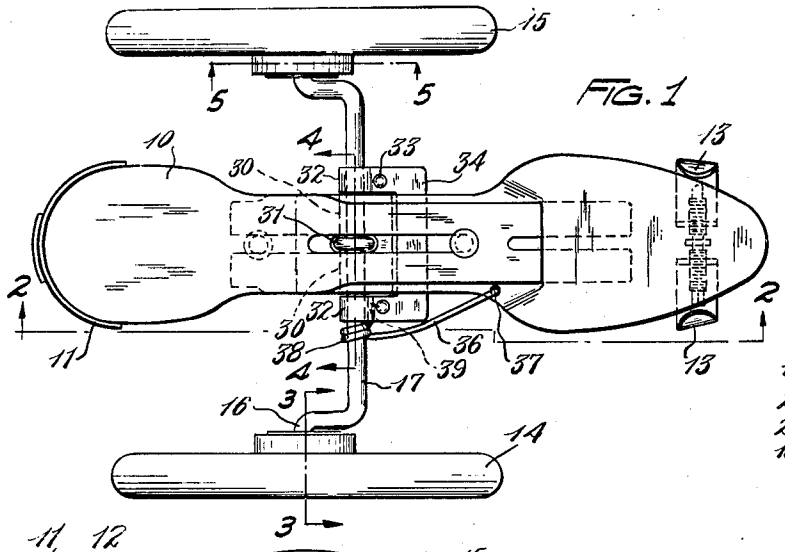


FIG. 1

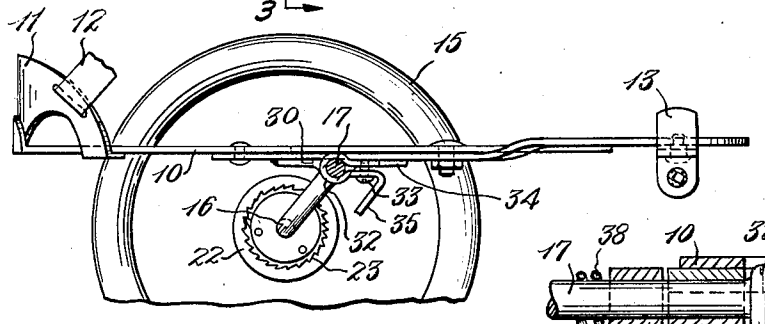


FIG. 2

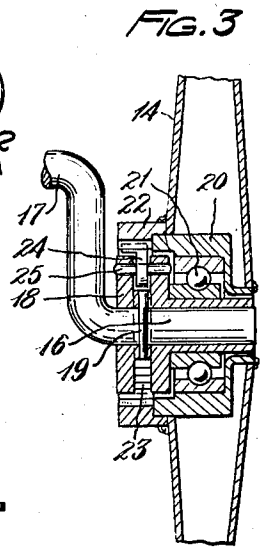


FIG. 3

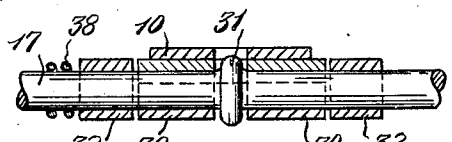


FIG. 4

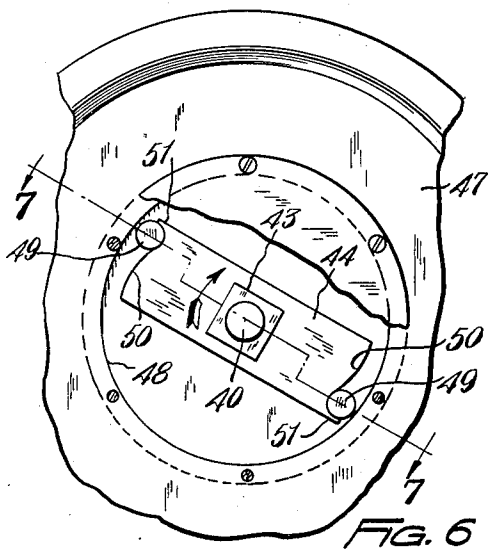


FIG. 6

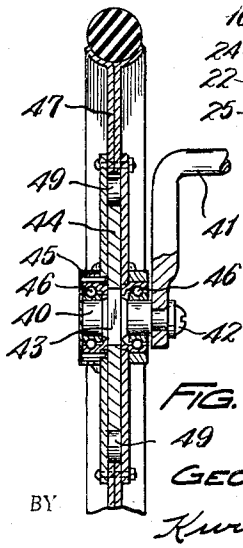


FIG. 7

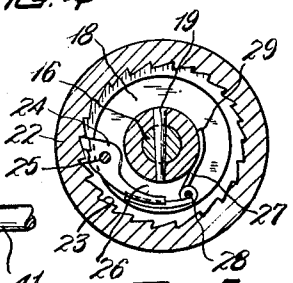


FIG. 5

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Patented July 11, 1939 2,165,996

UNITED STATES PATENT OFFICE

2,165,996

SKATE

George S. Chiles, Chicago, Ill.

Application February 12, 1937, Serial No. 125,414

7 Claims. (Cl. 280—11.11)

This invention relates to roller skates and more particularly to a skate in which the weight of the skater is used as a propelling force.

It is one of the objects of the invention to provide a novel type of skate that will embody a unique mode of operation whereby the skater, by applying his weight to the skate and then lifting his foot, will be propelled along at a fairly rapid speed.

It is a further object of the invention to provide a novel form of skate, of the type referred to, that may be used either singly or in pairs or used with an ordinary non-propelling type of skate.

Other objects of the invention and the features of novelty will be apparent from the following description taken in connection with the accompanying drawing, of which

Fig. 1 is a plan view of a skate embodying my invention;

Fig. 2 is a longitudinal section thereof on the line 2—2 of Fig. 1;

Fig. 3 is an enlarged transverse section on the line 3—3 of Fig. 1;

Fig. 4 is an enlarged detail section on the line 4—4 of Fig. 1;

Fig. 5 is an enlarged detail section on the line 5—5 of Fig. 1;

Fig. 6 is a fragmentary elevation of one of the wheels, with certain parts broken away to show a different type of free-wheeling device for applying the propelling force to the wheel; and

Fig. 7 is a transverse section on the line 7—7 of Fig. 6.

Referring to the drawing, 10 indicates the foot-plate having the usual heel plate 11 at the rear, to which a strap 12 is attached for the purpose of securing the heel portion of the foot-plate to the shoe of the wearer. At its forward end the foot-plate may be provided with the adjustable sole clamps 13 for securing the toe portion of the foot-plate to the shoe of the wearer, as is common practice in skates. The ground wheels are indicated at 14 and 15 and are preferably in axial alignment and mounted on an axle 16, the central portion of the axle, between the wheels 14 and 15, being bent to form a crank 17.

Referring particularly to Fig. 3, it will be seen that the wheels are rotatably mounted on a sleeve 18, which is secured to the end of the axle 16 by a pin 19. Between the hub 20 of the wheel and the sleeve 18 there is a bearing which is preferably a ball bearing, as shown at 21. The hub 20 has an inward extension 22 that is provided with ratchet teeth 23 on its interior. A pawl 24 is pivotally mounted on the sleeve 18, by means of a pin 25, and the tail 26, of the pawl 24, is engaged by a spring 27 to normally press the pawl into engagement with the ratchet teeth 23. The spring 27 is mounted on a pin 28 and has its end 29 anchored to the sleeve 18 so as to be under tension and cause the pawl to engage the ratchet teeth, as previously stated. This method of mounting the wheels permits them to rotate freely in one direction relative to the axle 16 and when the crank 17 is swung downward from the position shown in Figs. 1, 2 and 3, the pawl 24 will cause the wheel to turn with the axle. This movement of the crank 17 is effected by the skater bearing down on the foot-plate 10 and, as will be obvious, this will cause the wheels to be rotated in the forward direction, and when the crank 17 reaches its lowermost position the wheels will be permitted to coast along because of the free-wheeling action of the pawl and ratchet.

The crank 17 is attached to the foot-plate 10 by means of a bearing member 30, which is secured to the underside of the foot-plate, and a small collar 31, secured at the middle of the crank 17, holds the foot-plate in position and against movement longitudinally of the crank.

The swinging movement of the crank 17 relative to the foot-plate is limited by a member 32 which is clamped to the crank, at the opposite sides of the foot-plate 10, as will be seen from Fig. 1, the clamping being effected by the screws 33, it being understood, however, that the member 32 may be secured to the crank 17 in any other suitable manner. The member 32 has a part 34 which projects forwardly and is adapted to engage the underside of the foot-plate 10 as indicated in Fig. 2, thereby limiting the movement of the crank, relative to the foot-plate, in one direction. The member 32 also has a bent arm 35 which, when the crank is at its lowermost position, is adapted to engage with the underside of the foot-plate 10 at a point rearwardly of the crank 17 and thus limit the rotation in the other direction.

To assist in the operation of the skate, a spring 36 may be provided, this spring having one end anchored to the foot-plate as indicated at 37 and being coiled around the crank 17, as indicated at 38, and having its other end anchored in the member 32, as indicated at 39. When the crank 17 is swung from its position shown in Fig. 2, to its lowermost position the spring 36 is wound up or tensioned, and when the skater raises his foot, the spring will tend to return the parts to the position shown in Fig. 2.

In operation the skater may use one of the skates just described on each foot or he may use one of these skates on one foot and an ordinary non-propelling skate on the other foot. If the skater uses two of the skates described and illustrated he can propel himself along by putting his weight on one foot and, at the same time, lifting the other foot and then alternating these movements. In this way first one skate and then the other will act as the propelling means. If the skater uses but one of these propelling skates he can use the ordinary non-propelling

skate as a coaster and by alternately pushing down on the propelling skate and then lifting his foot he will be propelled along.

In Figs 6 and 7 I have illustrated a frictional type of free-wheeling device which may be used in place of the pawl and ratchet device previously described and for several reasons this frictional device is to be preferred. In this construction the axles 40 may be separate elements and secured to the crank 41 by screws 42, or in any other suitable manner. The middle portion of each axle is preferably square or of other non-circular form, as indicated at 43, and a plate 44 is mounted on this squared part of the axle so as to be firmly attached thereto. Between the end portions of the axles 40 and the hub 45 of each wheel there are ball bearings 46. The web 47 of the wheel has a relatively large central opening 48 which is concentric to the axle 40 and acts as a track for rollers 49, which are carried by the outer ends of the plate 44. It will be noted that these ends of the plate 44 are curved to form cams, as indicated at 50, and there are projections 51 which retain the rollers 49 in position. When the plate 44 is rotated in the direction of the arrow, in Fig. 6, the rollers 49 will be forced outward by the cams 50 and wedged between the cam surfaces and the track 48 so as to form a driving connection between the plate 44 and the wheel. Relative rotation of the plate 44 and the wheel, in the opposite direction from the arrow, is permitted by the fact that the rollers 49 will then assume substantially the position shown in Fig. 6. This is a common form of overrunning clutch or free-wheeling device and while, per se, it is not my invention, it is well adapted for use in the combination which I have devised as a means for forming an efficient driving connection, which will operate quietly and without liability to become damaged in service.

While I have illustrated and described what I now consider to be satisfactory designs for the application of my invention, it will be understood that various changes may be made in the details of construction without departing from the spirit of the invention which is defined in the appended claims.

Having thus described my invention, what I claim is:

1. In a skate, the combination of a foot-plate, a pair of wheels, an axle, said axle having a crank, means pivotally connecting said foot-plate directly to said crank whereby said axle and wheels are adapted to swing relative to said foot-plate in an arc about said connecting means, and means forming a driving connection between said axle and one of said wheels when the axle is rotated in the same direction that said wheels rotate during forward movement of the skate.

2. In a skate, the combination of a foot-plate, a pair of wheels, an axle, said axle having a crank, means pivotally connecting said foot-plate directly to said crank whereby said axle and wheels are adapted to swing relative to said foot-plate in an arc about said connecting means, and a free-wheeling device which forms a driving connection between said axle and one of said wheels when the axle is rotated in the same direction that said wheels rotate during forward movement of the skate.

3. In a skate, the combination of a foot-plate, a pair of axially aligned wheels, an axle on which said wheels are mounted, said axle having a crank between said wheels, means pivotally connecting said foot-plate directly to said crank whereby said axle and wheels are adapted to swing relative to said foot-plate in an arc about said connecting means, a free-wheeling device which forms a driving connection between said axle and one of said wheels when the axle is rotated in the same direction that said wheels rotate during forward movement of the skate, and means limiting the extent of the relative rotating movement between said foot-plate and said crank.

4. In a skate, the combination of a foot-plate, a pair of axially aligned wheels, an axle on which said wheels are mounted, said axle having a crank between said wheels, means pivotally connecting said foot-plate directly to said crank whereby said axle and wheels are adapted to swing relative to said foot-plate in an arc about said connecting means, a free-wheeling device which forms a driving connection between said axle and one of said wheels when the axle is rotated in the same direction that said wheels rotate during forward movement of the skate, and spring means to return said crank to its driving position after a driving movement thereof.

5. In a skate, the combination of a foot-plate, a pair of axially aligned wheels, an axle on which said wheels are mounted, said axle having a crank between said wheels, means pivotally connecting said foot-plate directly to said crank whereby said axle and wheels are adapted to swing relative to said foot-plate in an arc about said connecting means, a free-wheeling device which forms a driving connection between said axle and one of said wheels when the axle is rotated in the same direction that said wheels rotate during forward movement of the skate, means for limiting the extent of the relative rotating movement between said foot-plate and said crank, and spring means to return said crank to its driving position after a driving operation thereof.

6. In a skate, the combination of a foot-plate, a pair of wheels, an axle on which said wheels are rotatably mounted, said axle having a crank between said wheels, means for journaling said foot-plate directly to said crank, and friction means forming one-way driving connections between said axle and said wheels whereby the application of pressure to said foot-plate when said crank is in an elevated position will cause forward rotation of said wheels.

7. In a skate, the combination of a foot-plate, a pair of wheels, an axle on which said wheels are rotatably mounted, said axle having a crank between said wheels, means pivotally connecting said foot-plate and directly to said crank whereby said axle and wheels are adapted to swing relative to said foot-plate in an arc about said connecting means, and ratchet means forming one-way driving connections between said axle and said wheels whereby the application of pressure to said foot-plate when said crank is in an elevated position will cause forward rotation of said wheels.

GEORGE S. CHILES