No. 880,519. PATENTED MAR. 3, 1908.

F. GRAFFENBERGER.

CONVERTIBLE SKATE.

APPLICATION FILED JULY 20, 1907.

Fig. 1.

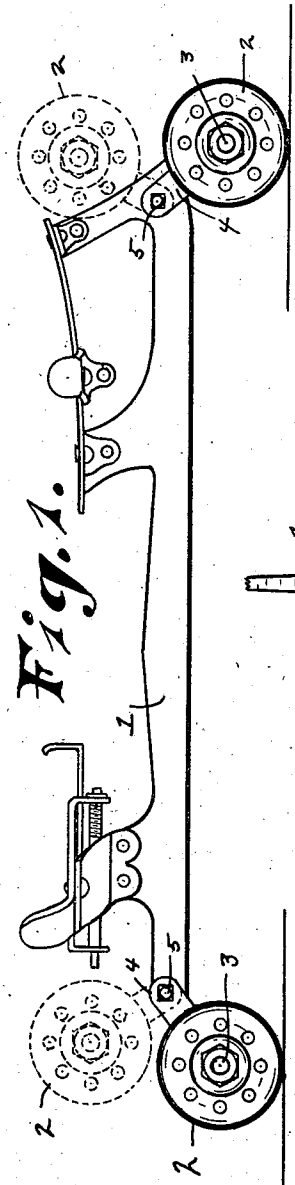


Fig. 2.

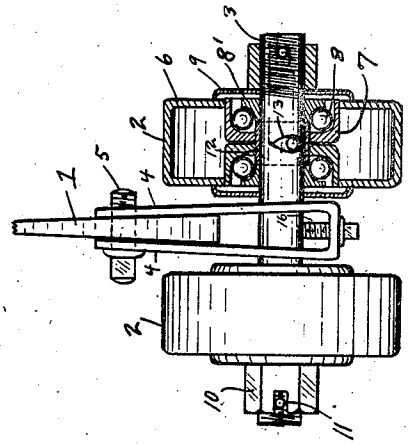


Fig. 3.

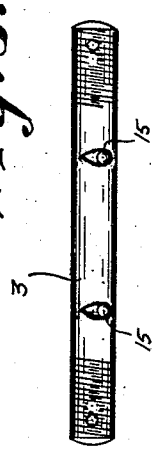
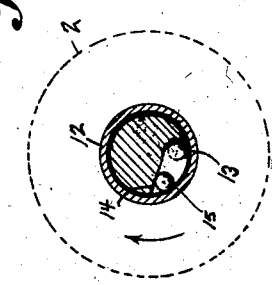


Fig. 4.



WITNESSES:

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CONVERTIBLE SKATE.

No. 880,519. Specification of Letters Patent. Patented March 3, 1908.

Application filed July 20, 1907. Serial No. 384,699.

To all whom it may concern:

Be it known that I, FRIEDRICH GRAFFENBERGER, a citizen of the United States, residing at Milwaukee, county of Milwaukee, and State of Wisconsin, have invented new and useful Improvements in Convertible Skates, of which the following is a specification.

My invention relates to improvements in combination ice and roller skates.

The object of my invention is to provide the ordinary ice skate with suitable rollers which may be either attached to and detached from the blade of the ice skate, or may be adjusted into and out of position for use without detaching them and in which one or both of each pair of rollers may be employed as a brake, when desired, the brake being preferably operative to prevent rotation in one direction only, whereby the rollers are prevented from revolving backwardly as the back stroke is being given. Regard is also had for simplicity, durability and weight, the invention being designed so as to add as little as possible to the weight of an ordinary skate.

In the following description reference is had to the accompanying drawings, in which,

Figure 1 is a side view of an ordinary skate with my invention applied thereto. Fig. 2 is an enlarged detail view in front elevation showing one of the rollers in vertical section. Fig. 3 is a view of one of the roller supporting shafts. Fig. 4 is a cross sectional view drawn through the socket of the ball clutch, and showing the ball in clutching position, with dotted lines indicating its inoperative position.

Like parts are identified by the same reference characters throughout the several views.

1 is the blade of a skate of ordinary construction.

2 are the rollers which are connected in pairs to the respective ends of the blade by means of the roller supporting shafts 3, clamping plates 4 and clamping screws 5, the latter being preferably passed through suitable holes formed in the blade of the skate for that purpose. Clamping plates 4 for each set of rollers are preferably formed integrally of a single piece of metal which is bent in the form of a yoke with the clamping screw 5 passing through the free ends or arms of the yoke and with the shaft 3 passing through the yoke arms near the base. Each of the rollers 2 is preferably in the form of a hollow shell 6 provided with bearing members 7 adapted to retain the balls 8 which are interposed between the bearing 7 and raceways 8′ on the shaft. The bearing members 7 are pressed forcibly into circular apertures in the side walls of the shell and are held in position by friction, or by brazing or riveting, if desired, washers 9 being employed to hold the bearing members, raceways and the shell in position on the shaft. The outer washers are engaged by suitable clamping nuts 10 which may be locked in any desired position of adjustment by keys 11.

The inner walls of the bearing members 7 are connected with a ring 12 which incloses a socket 13 in the shaft and from which a segmental channel 14 extends partially around said shaft and leads from the socket outwardly with gradually decreasing depth in a direction opposite that of progressive roller rotation, whereby a ball clutch 15 may either occupy an inoperative position in the socket, or may be delivered by gravity into the channel 14 and permitted to roll to the shallow end of said channel, whereupon the ball binds between the ring 12 and the base of the channel and locks the roller against rotation. The central portion of the shaft 3 is exposed between the yoke arms 4, and a portion of this shaft is preferably cut away or marked as indicated in Fig. 2, forming a slight socket which receives a set screw 16 so that the position of the shaft, with reference to the ball clutch 15 and the socket 13, may be ascertained by inspection and locked in any desired position by the set screw 16. When it is desired to have the roller run freely, the shaft is turned so that the ball will drop by gravity into the socket 13, the clutch being thus rendered inoperative. By a partial rotation of the shaft however, the ball is permitted to drop out of the socket to a point in the channel where it will serve as a clutch. The shaft will be retained in position (when the clutch is operative) by the set screw 16, which may be loosened to permit the shaft adjustments by means of an ordinary skate key, which is also used to adjust the shaft. With this construction a brake is provided which may be made effective or not at the option of the user, even when the ball in one of the rollers is in a clutching position, for the reason that the weight of the user may be shifted from one of the rollers to the other in accordance with the desire of the user to have either a free run or a brake.

The clutch is preferably used in connection with but one of the rollers. It is obvious, however, that it may be applied to both, if desired, and may be oppositely arranged in the two rollers, whereby one of the clutches may be made to operate in one direction and the other in the other direction. Ordinarily, however, the clutch will be principally used to prevent backward rotation of the rollers, and to thus facilitate hill climbing.

The clamping bolt 5 is preferably made with a square head adapted to receive an ordinary skate key so that by means of such a key the clamping arms 4 may be loosened at any time and the rollers either swung to the operative position in which they are shown in Fig. 1 or to an inoperative position as shown by dotted lines in said figure.

It is not essential to my invention that the clamping bolt 5 be passed through a hole in the blade of the skate, since it is obvious that the arms 4 may be adjusted across the blade and the clamping bolt 5 passed through any opening in the skate frame. The holes in the blade of the skate for the reception of the bolt 5 are preferably employed, however, for the sake of convenience in adjusting the rollers in and out of operative position without removing them. The clamping arms or plates 4 are preferably formed of resilient material so as to perform the function of springs and permit a yielding movement as the rollers pass over an uneven surface.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is,

1. The combination with the respective ends of an ice skate blade, of an adjustable roller supporting shaft, clamping arms adjustably connecting said shaft with the skate blade, a roller mounted on said shaft, and a clutch brake adapted, in one position of adjustment on the shaft, to resist a backward rotation of said roller.

2. The combination with the respective ends of an ice-skate blade, of clamping arms connected with the skate blade, an adjustable shaft journaled in said arms and normally non-rotatable, a roller mounted on said shaft and a gravity clutch for the roller loosely connected with the shaft and adapted to move to inoperative position when the shaft is in one position of adjustment.

3. The combination of an ice skate blade perforated near its respective ends, a roller supporting clamping member at each end of the blade having a clamping bolt extending through said perforation and a roller carried by the clamping member, said clamping member being adapted to swing on the clamping bolt as a pivot to adjust the roller either above or below the skate blade when the pivotal clamping bolt is loosened.

4. The combination of an ice skate blade, a clamping yoke at each end thereof pivotally connected with the blade, a shaft adjustably mounted in said clamping yoke, a pair of rollers mounted on the shaft and a clutch member adapted to lock said rollers against rotation in one direction in one position of adjustment of said shaft.

5. The combination of an ice skate blade, a clamping yoke at each end thereof pivotally connected with the blade, an adjustable shaft mounted in said clamping yoke, a pair of rollers mounted on the shaft and means for locking said shaft against rotation, said shaft being provided with a socket and a channel of gradually decreasing depth leading therefrom, a loose ball adapted to move in said socket and channel and a ring connected with the roller and adapted to be engaged by said ball when at the shallow end of said channel whereby roller rotation toward the shallow end of the channel is prevented when the ball is in that position.

In testimony whereof I affix my signature in the presence of two witnesses.

FRIEDRICH GRAFFENBERGER.

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