(No Model.)

# C. STORLA.

## ROLLER SKATE.

No. 499,052 Patented June 6, 1893.

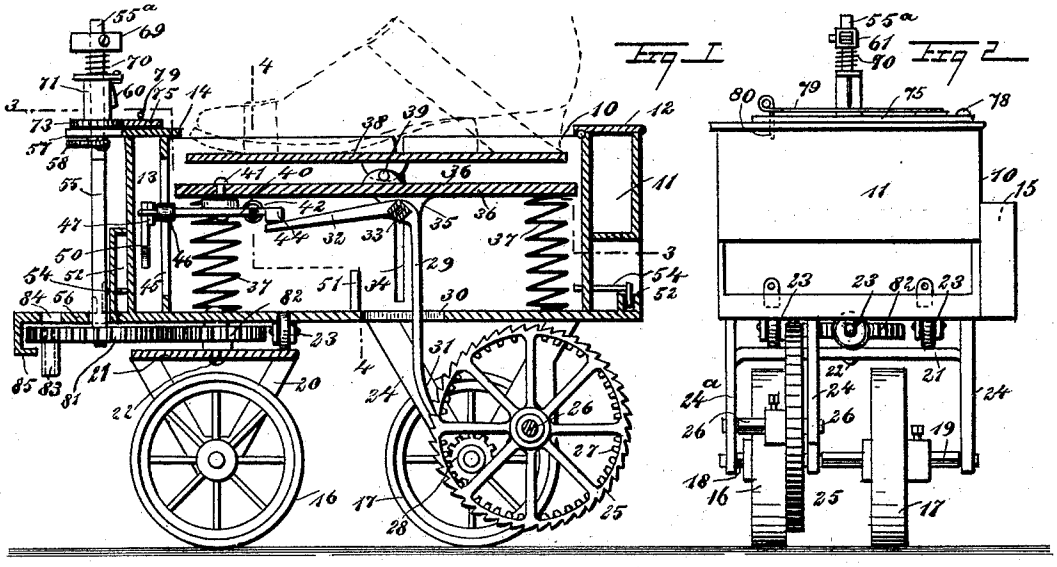

Fig 1



Fig 2

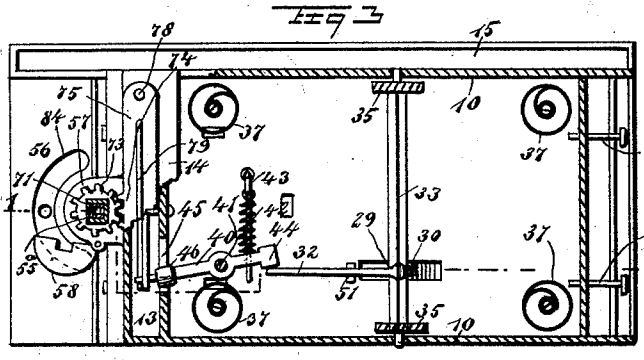

Fig 3

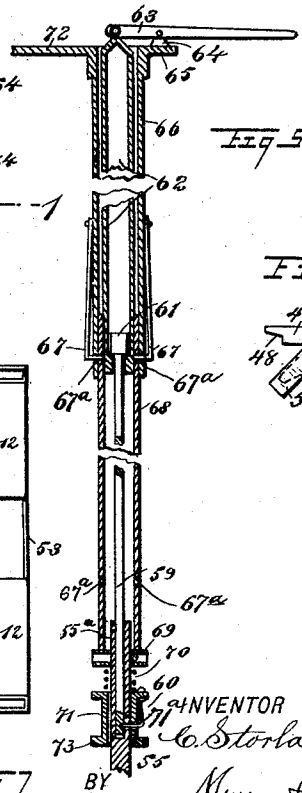

Fig 5

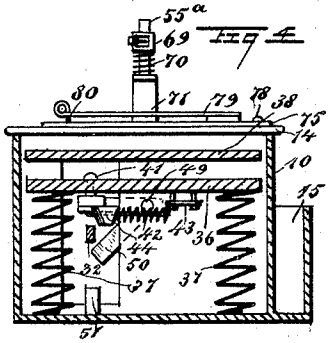

Fig 4

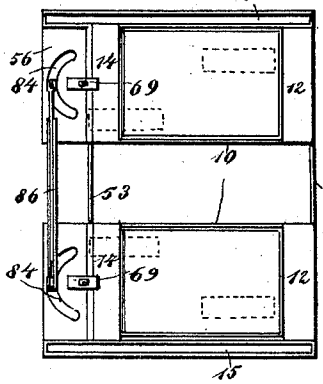

Fig 5

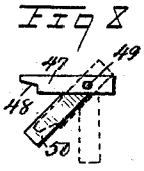

Fig 8

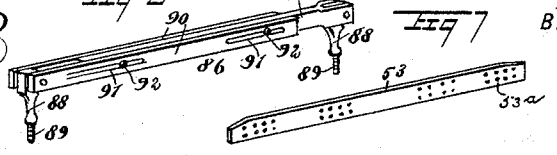

Fig 6 Fig 7

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# UNITED STATES PATENT OFFICE.

CARL STORLA, OF BELFORD, SOUTH DAKOTA.

## ROLLER-SKATE.

SPECIFICATION forming part of Letters Patent No. 499,052, dated June 6, 1893.

Application filed March 10, 1892. Serial No. 424,404. (No model.)

*To all whom it may concern:*

Be it known that I, CARL STORLA, of Belford, in the county of Aurora and State of South Dakota, have invented a new and Improved Roller-Skate, of which the following is a full, clear, and exact description.

My invention relates to improvements in roller skates, and the object of my invention is to produce a roller skate which may be conveniently and rapidly propelled by the weight of the skater, this being effected by simply shifting the weight from one skate to the other, to provide means for tying the skates together so that they will form a vehicle to safely carry the rider, to produce a convenient steering mechanism for the skates, and to provide the skates with compartments adapted to hold the steering mechanism, wrenches, or other articles when necessary.

To this end, my invention consists in a roller skate, the construction of which will be hereinafter described and claimed.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar figures of reference indicate corresponding parts in all the views.

Figure 1 is a vertical longitudinal section of the skate embodying my invention, on the line 1—1 in Fig. 3. Fig. 2 is a rear end view of the same. Fig. 3 is a broken sectional plan on the line 3—3 in Fig. 1. Fig. 4 is a vertical cross section through the skate body, on the line 4—4 in Fig. 1. Fig. 5 is a broken detail longitudinal section of the steering tubes and their connections. Fig. 6 is a detail perspective view of the tie bar used to connect the steering gear wheels of two skates. Fig. 7 is a detail perspective view of a cross bar used to fasten the skates together. Fig. 8 is a detail side elevation of the releasing lever used to prevent the bell crank lever from engaging the ratchet wheel except to drive it; and Fig. 9 is a plan view on a reduced scale of two skates secured together.

The skate is provided with a box-like frame 10, which is open on top, and the frame has at one end a box 11, adapted to receive a wrench, oil can, or other necessary articles, and the box is closed by a swinging lid 12, the front edge of which juts over the main portion of the box 10. At the front end of the skate body is another compartment 13, which is closed at the top by a cover 14, which juts rearwardly over the top of the front end of the main box 10, the cover 14 and the front portion of the lid 12 serving to limit the upward movement of one of the movable platforms of the skate as hereinafter described. On one side of the skate is a box or compartment 15, extending the entire length of the skate body, and which is adapted to receive the collapsed steering rods when they are not in use.

The skate is mounted on wheels 16 and 17, arranged at the front and rear part thereof, the wheels being fixed to square axles 18 and 19, and the front axle 18, being journaled in the depending hangers 20, formed on the ends of the yoke or table 21, which is pivoted to the front under side of the body or frame 10, as shown at 22 in Fig. 1. Rollers 23, are pivoted on the under side of the frame or body 10, and are arranged to bear upon the yoke or table 21, so that the latter may turn very easily. The rear axle 19, is journaled in hangers 24, which are secured to the under side of the frame or body 10, and the wheel 17 is generally arranged a little off the center, that is, nearer the outside of the center than the inside, the front wheel 16 being generally arranged a little nearer the inside of the skate, though heels 16 and 17 can be brought to right or left at pleasure by sliding on axles 19 and 18 and fastened firmly to said axles by means of screws. A supplemental hanger $24^a$ is secured to the body opposite the hangers 24, so as to form a bearing for the axle 26 of the ratchet wheel 25, and this ratchet wheel is driven by mechanism held in the frame or body 10 as described below, and is provided on its inside, that is, on the inner side of the rim, with cogs 27, which engage the teeth of a pinion 28, secured to the axle of the rear wheel 17. It will thus be seen that the movement of the ratchet wheel in one direction will turn the pinion 28, and drive the wheel 17, thus propelling the skate. The ratchet wheel 25 is turned by a bell crank lever 29, which is pivoted in the skate body and extends downward through a slot 30 in the same, the lower end of the vertical arm of the bell crank being formed into a pawl 31, which engages the ratchet wheel, as shown in Fig. 1, and the other arm 32 of the bell crank

being made to extend forward into the skate body so as to engage tripping mechanism as hereinafter described. The bell crank 29, is secured to a transverse rod 33, the ends of which are held to slide in vertical grooves or slots 34 in the sides of the frame or body 10, and the rod is journaled in lugs or ears 35, on the under side of a vertically-movable platform 36, which is mounted in the frame or body 10, and is normally pressed upward by the spiral springs 37, arranged beneath it and adjacent to its four corners. The upward movement of the platform 36, is limited by the inwardly jutting ends of the lid 12 and cover 14 shown in Fig. 1. Above the platform 36, is a second platform 38, which is hinged centrally to the main platform, as shown at 39, and this enables the foot of the skater resting upon the platform 38, to have a very easy movement as the platform may tilt to conform with the varying positions of the foot, according as the foot is advanced or retracted raised or lowered. The platform 38 may be provided with any suitable straps or fastening mechanism to attach it to the foot of a skater, as shown by dotted lines in Fig. 1. It will be seen that when the skater presses down upon the platforms 38 and 36, they will be depressed, and the bell crank 29 will turn the ratchet wheel so as to propel the skate forward, and when the weight is removed from the platforms the springs 37 will throw the platforms back to their normal positions.

The following mechanism is used to prevent the bell crank from touching the ratchet wheel during the upward movement of the platforms so as not to interfere in any wise with the free motion of the skates. A tripping lever 40, is pivoted on a stud 41 on the under side and near the forward end of the platform 36, the lever having its rear end pressed by a spring 42, which is secured on a wire or rod 43 on the under side of the platform, so that the enlarged rear end 44 of the lever will extend into the path of the horizontal arm 32 of the bell crank lever 29. This enlarged end 44, is inclined on one edge and on the under side, as best shown in Fig. 4, so that when the arm 32 is pushed upward it may pass the lever. The forward end of the lever 40, projects through a slot 45 in one wall of the compartment 13, and the lever is provided with a roller 46, which turns by frictionally engaging the wall of the slot 45, and the front end of the lever 40 is adapted to engage a shoulder 48, on the under side and at the free end of a releasing lever 47, which is pivoted transversely on the inner wall of the compartment 13, as best shown at 49 in Fig. 4, and on the under side of the releasing lever 47, is an arm 50 which extends diagonally downward and serves as a keeper which serves to hold the lever 47 and tripping lever 40 in the proper relative positions. This is best shown in Fig. 4, the tripping lever when it moves down, strikes the arm 50 and carries the arm and lever 47 into the position shown by dotted lines in Fig. 8, and when the tripping lever moves back it comes into position to again engage the shoulder 48 and the lever 47.

Secured to the bottom of the body or frame 10, and extending upward within it is a post 51, which is arranged in the path of the arm 32 of the bell crank lever 29, and when the lever is pushed down, the post 51, by engaging the arm of the lever, tilts the lever so as to withdraw the pawl 31 from the ratchet wheel. Supposing the parts to be in the position shown in Fig. 1, but with the end 44 of the lever 40 beneath the arm 32, then when the platforms 38 and 36 are pushed down, the releasing lever 47 tilts the tripping lever 40, and throws the end 44 out of the path of the arm 32, and the pawl 31 springs into engagement with the ratchet wheel so that the descent of the platforms turns the ratchet wheel. When the platforms have advanced to nearly the lower end of their stroke, the arm 32 strikes the post 51, and is pushed upward, and the forward end of the arm passes the inclined side or edge of the thickened end 44 of the tripping lever 40, and the tripping lever springs back to place, thus passing beneath the under side of the arm 32, and holding the pawl 31 out of engagement with the ratchet wheel, when the pressure is removed from the platforms, the springs 37 raise them to their normal position.

At the front and rear ends of the skate are recesses 52, which are adapted to receive the ends of cross bars 53, and these may be used to connect two skates so as to hold them rigidly together, the cross bars being held in place by keys 54, which extend through holes $53^a$ in the cross bars and through corresponding holes in the end of the skate body, as shown in Fig. 1. At the front end of the skate is a vertical rod 55, of square cross section but which turns in cylindrical bearings the lower end of which projects through a platform 56, formed by a prolongation of the bottom of the skate body, and the upper portion of the rod is journaled in a lug 57 at the top of the skate body. The rod is held down by a swinging latch 58, which is recessed on its inner edge to fit the rod, as shown in Fig. 3, and which is adapted to engage a notch in the rod, this latch being pivoted on the under side of the lug 57. The upper end $55^a$ of the rod 55 is hollow so as to receive the inner steering rod 59, the rod is of circular cross section at a point where it is engaged by the latch so as to permit the free turning of the rod which is held to it by a spring pressed pin 60, which projects through the outer wall of the rod 55, and into a notch in the rod 59, as shown in Fig. 5, and the upper end of the rod 59 is enlarged to form a head 61, which is held in the lower end of a tube 62, the upper end of the tube having a lever 63 pivoted thereon, and this lever is fulcrumed, as shown at 64, on a flange 65 at the upper end of the upper square exterior steering tube 66, which tube is held by spring catches 67,

to a lower square section 68 of the tube having perforations 67ª to engage the catches, this lower section resting on a rest 69, which is fastened upon the upper end of the rod 55. A spring 70 is arranged between the rest 69 and a sliding sleeve 71, which sleeve is secured to the rod 55, by the same spring pressed pin 60 which secures the rods 55 and 59 together, the spring pressed pin having its outer end fixed to the sleeve 71, and its inner end adapted to extend through a notch or hole in the sleeve and into a slot 71ª in the shaft 55, as shown in Fig. 5. The spring 70 pushes the sleeve 71 downward to its seat so as to cause the gear wheel on its lower edge to engage the locking plate, as described below, and the slot 71ª permits the necessary movement of the sleeve when it is raised to throw the gear wheel out of engagement with the locking plate. The upper end of the steering tube 66 is provided with a lever 72, which extends outward and serves as a steering lever when both hands are used, as the lever 72 may be grasped with one hand and the lever 63 with the other. When only one hand is employed to steer the skates the lever 63 is used. The section 68 of the steering tube may be provided with several holes 67ª to engage the spring catches 67, so that it may be adjusted longitudinally, and by releasing these catches and the spring catch 60, the tubes 66 and 68, and the tube 62 and rod 59 may be collapsed, that is, telescoped, so that the tubes will occupy but little space, and they may then be packed within the box or compartment 15, which is shown clearly in Fig. 3.

The object of the sliding sleeve 71 and the lever mechanism for arranging it, is to enable the steering mechanism to be thrown in or out of gear as will be described below. At the lower end of the sleeve 71, and secured thereto, is a gear wheel 73, which is adapted to engage the teeth 74 on one edge of a locking plate 75, which plate is pivoted on the cover 14, as shown at 78 in Fig. 3, and a spring wire 79, is secured to the top of the locking plate, one end of the wire near the free end of the plate terminating in a pin 80, which is adapted to extend downward through the plate and into a hole in the cover 14, so as to hold the plate in a fixed position, and when the locking plate and the gear wheel 73 are in engagement, it will be seen that the steering mechanism cannot be turned. By swinging the locking plate 75 backward upon its pivot, however, the gear mechanism is left free to turn and the skates may be easily steered by means of the handle or lever 63.

On the lower end of the rod 55, and on the under side of the platform 56, is a gear-wheel 81, which meshes with a gear wheel 82 fixed to the pivot 22 of the yoke 21, so that by turning the rod 55 and the gear wheels 81 and 82, the yoke 21 and the forward wheel 16 may be turned, thus steering the skate. The steering mechanism is only to be used however when two skates are united, and to this end, the gear wheel 81, is provided near one edge with a tube 83, which registers with a curved slot 84 in the platform 56, and the tube is adapted to receive the studs of a tie bar as described below. The front end of the platform 56, is bent under as shown at 85 in Fig. 1, so as to form a shield for the gear wheel 81. To connect the gear wheels 81 of two skates, a tie bar 86 is used, shown in detail in Fig. 6, which tie bar comprises a bar 87, having pivoted at one end a stud 88, and the opposite member of the tie bar consists of two parallel bars 90, adapted to embrace the bar 87, these bars having also at one end a stud 88 and the bars 90 are slotted at 91, so as to receive screws 92, by means of which the length of the tie bar may be regulated. To connect two skates the studs 88 are inserted in the slots 84, and their free ends are pushed into the tubes 83 of the gear wheels 81, and consequently, when one gear wheel is turned the other gear wheel will be turned to the same extent, and the forward wheels 16 of the two skates will move in unison, so that the two skates may be very nicely steered.

The skates are operated by simply shifting the weight from one to the other. When the weight is thrown upon the platforms 38 and 36, they operate the ratchet wheel, and by means of the gear mechanism described above propel the skates, and from the foregoing description it will be seen that by shifting the weight often enough, the skates may be made to run very rapidly.

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

1. The roller skates comprising a box-like body mounted on wheels, movable spring pressed platforms held to move vertically within the body, a ratchet mechanism for turning the wheels by the downward movement of the platforms, and a tripping device for automatically releasing the ratchet mechanism during the upward movement of the platforms, substantially as described.

2. A roller skate, comprising a box-like body mounted on wheels, a ratchet wheel journaled beneath the body and geared to one of the wheel axles, a vertically-movable platform mounted within the body, and a bell-crank lever pivoted to the platform, said lever having one arm extending through a slot in the skate bottom and formed into a pawl to engage the ratchet wheel, substantially as described.

3. A roller skate, comprising a box-like body mounted on wheels, a ratchet wheel journaled beneath the body and geared to one of the wheel axles, a movable spring-pressed platform held to move vertically in the body, a bell crank lever pivoted on the under side of the platform and having its lower end extending through a slot in the body and adapted to engage the ratchet wheel, and mechanism for swinging the lever away from the ratchet

wheel during the up-stroke of the platform, substantially as described.

4. A roller skate, comprising a box-like body mounted on wheels, a ratchet wheel journaled beneath the body and geared to one of the wheel axles, movable spring-pressed platforms held to move vertically in the body, a guide for the platforms, a bell crank lever pivoted on the under side of the lower platform, said lever having its lower end extending through the skate body and adapted to engage the ratchet wheel, and mechanism for releasing the bell crank from the ratchet wheel during the up-stroke of the platforms, substantially as described.

5. In a roller skate, the combination of the body, the driving ratchet wheel pivoted thereon, the bell crank lever having one end formed into a pawl to engage the ratchet wheel, a post fixed to the skate body in the path of the upper arm of the bell crank lever, and a spring-pressed tripping lever having one end arranged in the path of the upper arm of the bell crank lever, substantially as described.

6. The combination of the movable lower platform, the bell crank lever pivoted thereon and adapted to engage a ratchet wheel as described, the spring-pressed tripping lever pivoted to the platform and held to move horizontally, and having one end adapted to engage an arm of the bell crank, and the weighted transverse releasing lever adapted to engage one end of the tripping lever and throw the same out of the path of the bell crank, substantially as described.

7. The combination, with the skates having horizontally-depending forward wheels, of gear wheels geared to the vertical pivots of the forward wheels, a tie bar adapted to connect the gear wheels of the two skates, and steering tubes adapted to turn one of the gear wheels, substantially as described.

8. The combination of the two skates adapted to be tied or fastened together, the skates having forwardly-extending platforms with curved slots therein, gear wheels pivoted beneath the platforms and geared to the forward wheel yokes so as to turn the same, a lever mechanism for turning the gear wheels, and a tie bar having pivot studs at its ends, said studs being adapted to extend through the curved slots of the platforms and engage the gear wheels, substantially as described.

9. The combination, with the skate body, the yoke pivoted to the under side of the body and the forward wheel journaled in the yoke, of a gear wheel geared to the yoke pivot, a vertical rod secured to the gear wheel and mounted on the skate body, and detachable steering tubes connected with the rod, substantially as described.

10. The combination, with a skate having a gear mechanism for steering it, of the detachable steering tubes adapted to be connected with the steering mechanism, said tubes being adapted to telescope one within the other, and having operating levers at their upper ends, substantially as described.

11. The combination, with the skate body, the yoke pivoted on the under side thereof and having the forward wheel journaled therein, the gear wheel pivoted to the yoke, and the vertical rod fixed to the gear wheel, of the detachable steering tubes adapted to be secured to the gear wheel rod, and locking mechanism for fastening the rod, substantially as described.

12. The combination, with the vertical rod geared to the pivots of the front wheel yoke as described, of a sleeve held to slide on the rod and having a gear wheel thereon, a catch to fix the position of the sleeve, a locking plate pivoted on the skate body and having teeth to engage the gear wheel of the rod, steering tubes detachably secured to the rod, and lever mechanism mounted within the steering tubes and adapted to connect with the sleeve, substantially as described.

13. In a roller skate, the telescoping steering tubes having spring catches to hold the sections in a fixed position in relation to each other, and a lever at the upper end of the tubes, substantially as described.

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