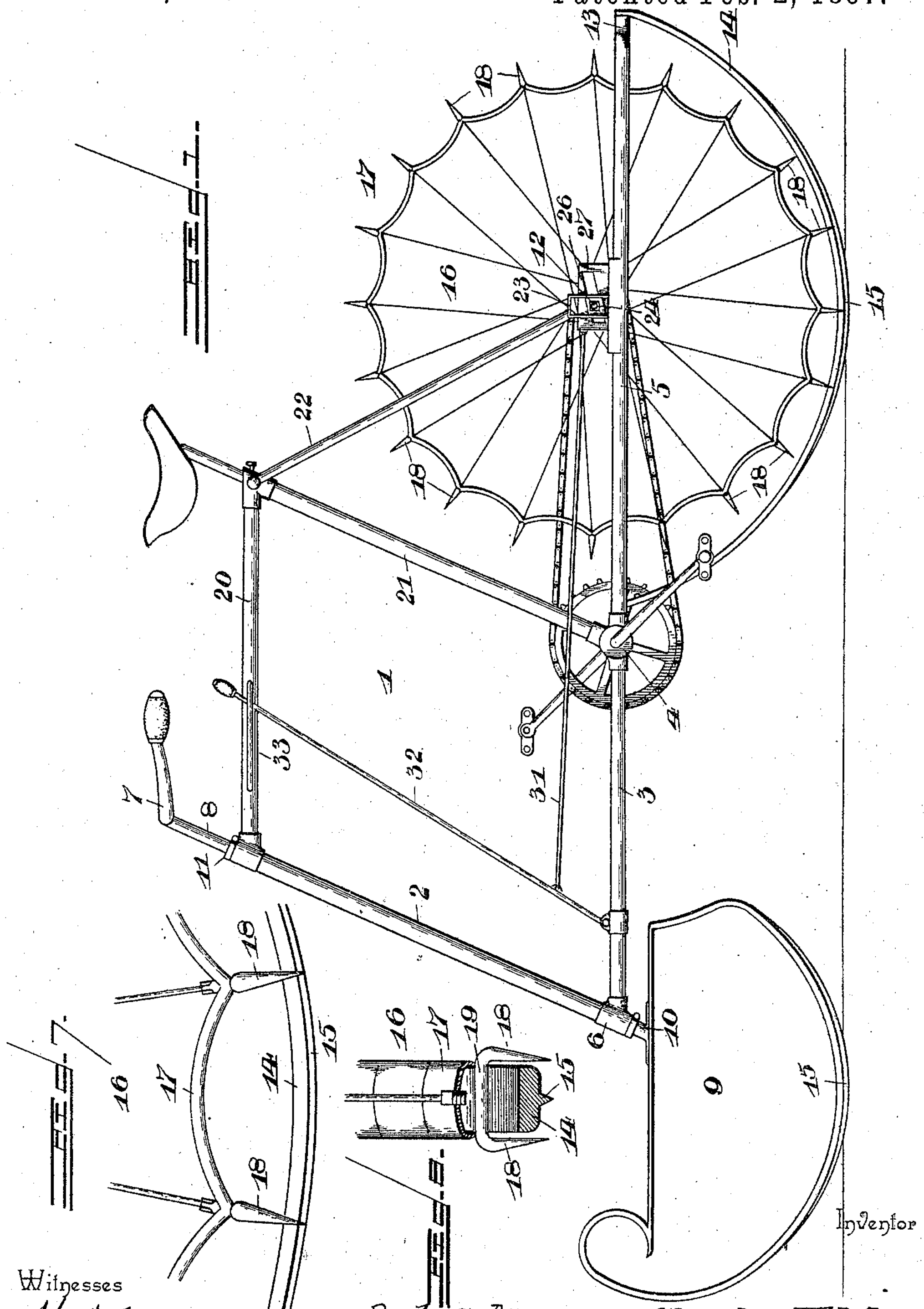
(No Model.) 2 Sheets—Sheet 1.

C. E. VOSE.

ICE VELOCIPEDE.

No. 576,354. Patented Feb. 2, 1897.



Inventor

Witnesses

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

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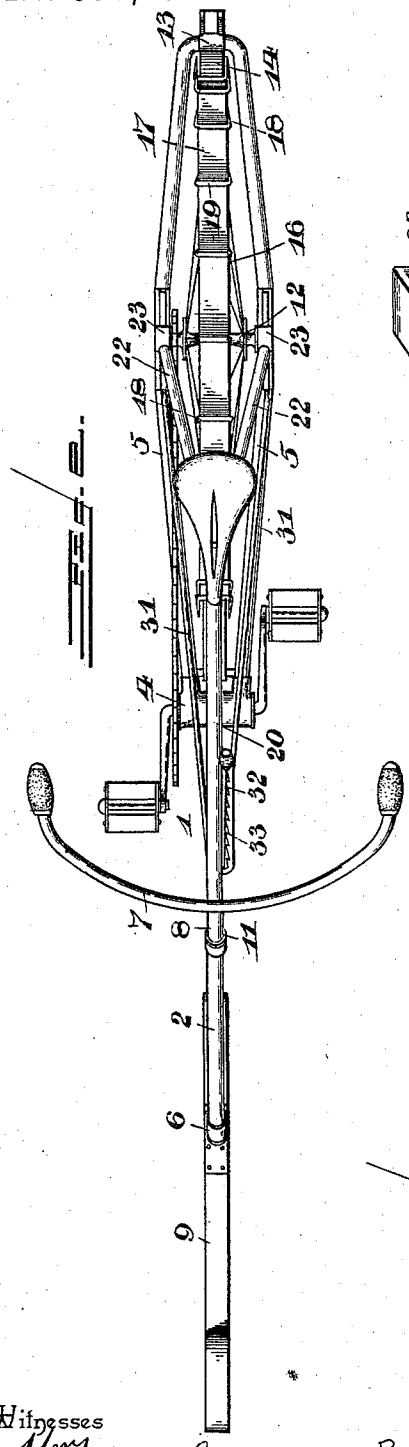

FIG. 2.

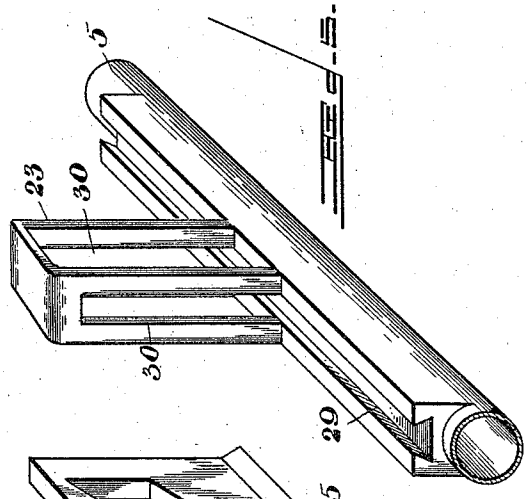

FIG. 5.

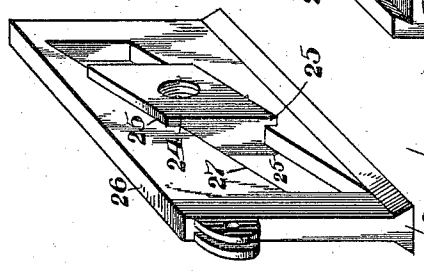

FIG. 6.

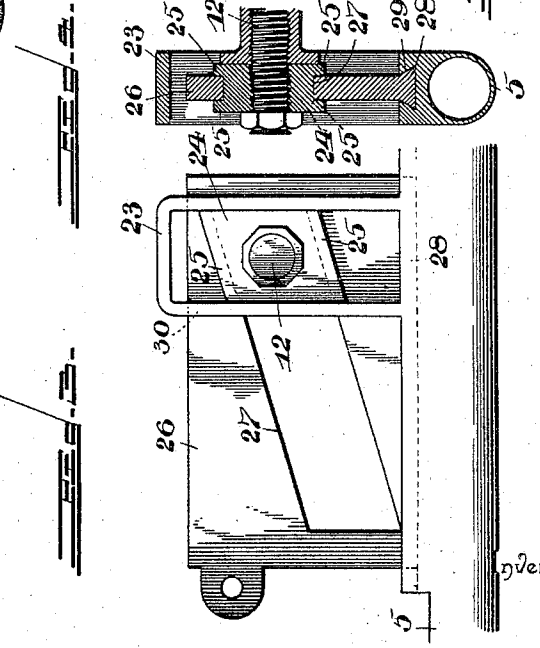

FIG. 4.

FIG. 3.

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UNITED STATES PATENT OFFICE.

CHARLES E. VOSE, OF PITTSFIELD, VERMONT.

ICE-VELOCIPEDE.

SPECIFICATION forming part of Letters Patent No. 576,354, dated February 2, 1897.

Application filed March 31, 1896. Serial No. 585,631. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. VOSE, a citizen of the United States, residing at Pittsfield, in the county of Rutland and State of Vermont, have invented a new and useful Ice-Bicycle, of which the following is a specification.

This invention relates to ice-bicycles, and has for its object to provide a simple and practical machine which is perfectly adapted to be ridden with safety and at high speed upon ice or snow.

The main object of the present invention is to provide in connection with an ice-bicycle a driving-wheel which is vertically adjustable for varying its grip upon the ice, and to employ in connection therewith novel means within easy reach of the rider while in the saddle by which the said driving-wheel may be adjusted to suit the nature or condition of the ice or snow and to lift the wheel entirely out of engagement for the purpose of coasting.

With these and other objects in view the invention consists in an improved ice-bicycle embodying certain novel features and details of construction and arrangement of parts, as hereinafter fully described, illustrated in the drawings, and finally pointed out in the claims hereto appended.

In the accompanying drawings, Figure 1 is a side elevation of an ice-bicycle constructed in accordance with the present invention. Fig. 2 is a plan view of the same. Fig. 3 is an enlarged side elevation of a portion of the machine-frame adjacent to the driving-wheel axle, showing the means for adjusting the driving-wheel. Fig. 4 is a detail transverse section through the same. Fig. 5 is a detail perspective view of the same portion of the frame. Fig. 6 is a similar view of the sliding wedge. Fig. 7 is an enlarged elevation of a portion of the driving-wheel rim, &c. Fig. 8 is a cross-section through the same.

Similar numerals of reference designate corresponding parts in the several figures of the drawings.

Referring to the accompanying drawings, 1 designates the machine-frame, which resembles the frame of an ordinary safety-bicycle. In order to adapt the frame the more effectually to the present invention, the head-tube 2 is made much longer than usual, and, instead of the reach-bar 3 inclining upwardly from the crank-hanger 4 to the head-tube, the said reach-bar is extended in a substantially horizontal plane and about in line with the rear fork 5, joining the head-tube, as shown at 6. The handle-bar 7 has a stem 8, made correspondingly longer, and said stem passes through the head-tube, where it connects below said tube with the forward steering-runner 9.

Instead of extending the stem 8 entirely through the tube, the front runner 9 may be provided with a tubular stem 10, like the front fork of an ordinary bicycle, and said stem may be extended upward entirely through the head-tube and be provided at its upper end with a clamping-collar 11, thus permitting the stem 8 of the handle-bar to be adjusted up and down and clamped at any point, thus providing for the vertical adjustment of the handle-bar.

The rear fork 5 connects at its front end with the crank-hanger 4 in the usual manner, and instead of terminating at the rear axle 12 the arms of the fork are extended rearwardly beyond such axle and beyond the wheel-rim, where they are joined together, as shown at 13. The rear runner 14, which is made in the segmental form shown, is attached at its front end to the machine-frame near the crank-hanger, and at its rear end is united to the connected rear ends of the fork 5. Both the front and rear runners are provided with the depending ribs 15, which extend longitudinally of the lower surfaces of the runners or shoes, the said ribs being preferably edged or given a V shape in cross-section, as clearly shown in Fig. 8. These ribs need not extend the entire length of the runners or shoes, but only sufficiently far to obtain a firm hold upon the ice, thus preventing the lateral slipping of the machine.

16 designates the driving-wheel, the rim 17 of which is made in scalloped form or provided with a series of inwardly-bowed portions between the engaging spurs 18, the object in giving the rim this form being to prevent ice or snow from accumulating and packing between the spurs and thereby interfering with the operation of the wheel. This rim may be formed of sheet metal of any de-

sired shape in cross-section, being shown for convenience in crescent shape in Fig. 8, and at its numerous vertices the rim has permanently secured thereto the spurs 18. Two spurs 18 are located at each vertex, and they are spaced apart transversely to an extent which will enable them to straddle the runner 14, as shown in Fig. 8. Each pair of spurs 18 is preferably formed in one piece, and this may be conveniently accomplished by taking a section of rod or wire of the proper length and bending the same into U shape, the terminals being pointed to form the spurs 18 and the central connecting portion 19 affording a base portion by which the spurs may be conveniently attached to the rim.

The machine-frame comprises an upper horizontal bar 20, a seat-post tube 21, and the upper rear fork 22, as in the ordinary diamond-frame safety-bicycle, but in the present construction a vertically-slotted bracket 23 is arranged at or near the junction of the lower fork 5 and the upper fork 22, one of such slotted brackets being located upon each side of the drive-wheel. These brackets receive the bearing-boxes 24, in which the axle 12 of the driving-wheel is mounted. These boxes 24 are of parallelogrammatic form, and they fit within the brackets 23, so as to be capable of vertical reciprocation therein. The upper and lower sides of these boxes, while parallel to each other, are oblique or at an angle to the front and rear edges or sides of the boxes, as shown in Figs. 3 and 6, and each box is provided at top and bottom with upwardly and downwardly extending flanges 25 upon both its outer and its inner faces, by which it is adapted to slidingly engage a wedge 26. The wedge 26 is formed with an inclined slot 27, and the box 24 fits loosely in said slot, the flanges 25 embracing the wedge upon each side and serving to hold the box against displacement. The wedge 26 is also provided with a dovetailed lower edge 28, which works in a dovetailed groove 29, formed in the upper surface of the rear fork 5. The bracket 23 is also provided in its front and rear walls with slots 30, through which the wedge may reciprocate. It will thus be seen that the wedges upon each side of the machine are capable of sliding longitudinally of the rear fork-arms and through the brackets 23, and as the boxes 24 are held within said brackets said wedges will operate by reason of their inclined slots to raise and lower the boxes 24 as they are reciprocated.

For the purpose of assembling the box 24, wedge 26, and bracket 23 the box may be divided or made in sections. The wedge is slid through the end apertures or slots 30 in the bracket 23, and the sections of the box 24 are then brought together from opposite sides of the bracket 23 and inserted in the inclined slot of the wedge, the box-sections then being bolted together or otherwise united to guard against displacement.

Rods or links 31 are connected to the front portions of the wedges 26, from whence they extend forward and connect with a hand-lever 32, pivoted at its lower end to the reach-bar 3 and extended at its upper end within reach of the rider while in the saddle. The lever 32 is also engaged near its upper end and held at any desired point of adjustment by means of a toothed rack-bar 33.

From the foregoing description it will be seen that the rider, without dismounting from the machine, may readily raise or lower the driving-wheel and thus regulate the extent to which the spurs of the driving-wheel project beneath the lower surface of the rear runner or shoe. The varying conditions of the ice or snow may render the necessity for this adjustment quite frequent, and it is therefore important to provide for such adjustment and place the means for effecting the same within easy reach of the rider. The construction described also locates the point of engagement of the driving-wheel at the point of contact of the rear runner with the ice, thus leaving only two points of contact between the machine and the ice, the same as in the ordinary bicycle. This is important, as it renders the steering of the machine much easier than where three points of contact are present.

In operation, the rider vibrates the lever 32 rearward until the desired engagement is effected between the driving-wheel and the ice or snow. After attaining a high speed or upon coming to a long decline the rider may thrust the lever 32 forward and thus lift the drive-wheel, so as to throw the same entirely out of operation, under which adjustment the machine will coast without turning the driving-wheel.

It will of course be understood that the usual sprocket-wheels, chain, and crank-axle with attached crank, as shown, may be employed for driving the machine, or that any other driving mechanism may be employed; also that changes in the form, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

Having thus described the invention, what is claimed as new is—

1. The combination with the machine-frame provided with runners as described, of a driving-wheel having its rim scalloped to form clearance-spaces, a pair of spaced and transversely-alined radial spurs located at each vertex of said rim, and means for actuating said wheel, substantially as described.

2. The combination with the machine-frame, provided with runners as described, of the vertically-adjustable driving-wheel, sliding wedges for raising and lowering the same with a positive movement, and means for actuating said wedges, substantially as described.

3. The combination with the machine-frame provided with the runners, of the driving-wheel having its axle mounted in vertically-sliding boxes, sliding wedges coacting with

said boxes both to raise and lower the wheel positively, and means for operating the wedges, substantially as described.

4. The combination with the machine-frame, provided with runners and having vertically-slotted brackets, of the driving-wheel having its axle mounted in boxes sliding within said bracket, sliding wedges operating directly against said boxes for positively raising and lowering the same, and means for operating said wedges, substantially as described.

5. The combination with the machine-frame having the runners as described, of the driving-wheel having its axle mounted in vertically-adjustable boxes, the wedges having the inclined slots in which said boxes lie and slide, and means for sliding said wedges, substantially as described.

6. The combination with a frame having centrally-disposed and longitudinally-alined runners as described, of a driving-wheel having its rim located directly over and approximately equal in width with one of said runners, pairs of spaced transversely-alined spurs which straddle and operate respectively upon opposite sides of the plane of said runner, each pair being constructed of a single blank, of which the terminals form the spurs, while the intermediate connecting portion provides means of attachment to the rim, and means for actuating said wheel, substantially as specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

CHARLES E. VOSE.

Witnesses:
F. L. BRIGHAM,
KATE L. BRIGHAM.