

(No Model.)

2 Sheets—Sheet 1.

C. KRAMER.

VELOCIPÈDE.

No. 355,324.

Patented Jan. 4, 1887.

FIG. I.

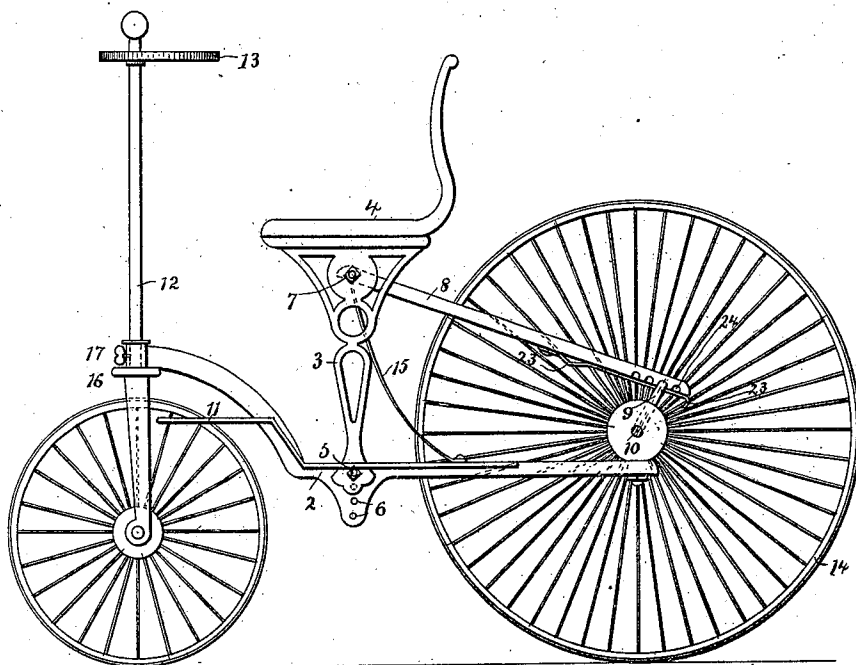
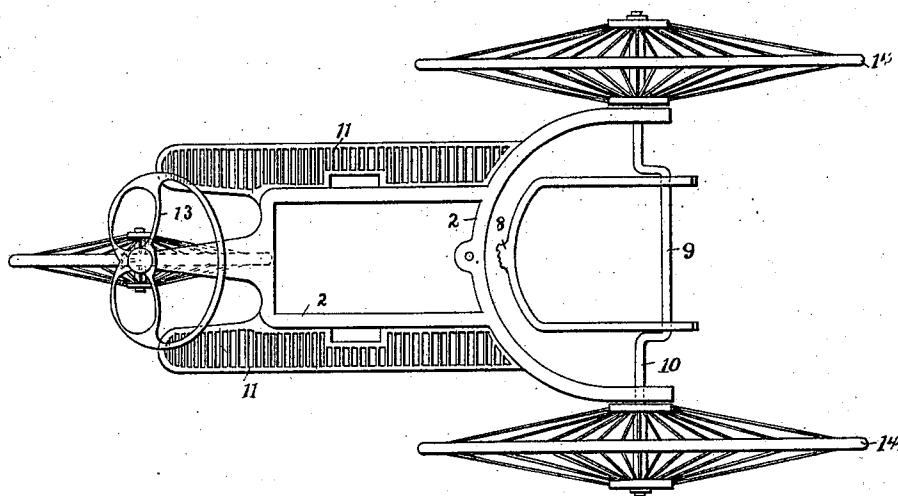


FIG. II.



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FIG. III.

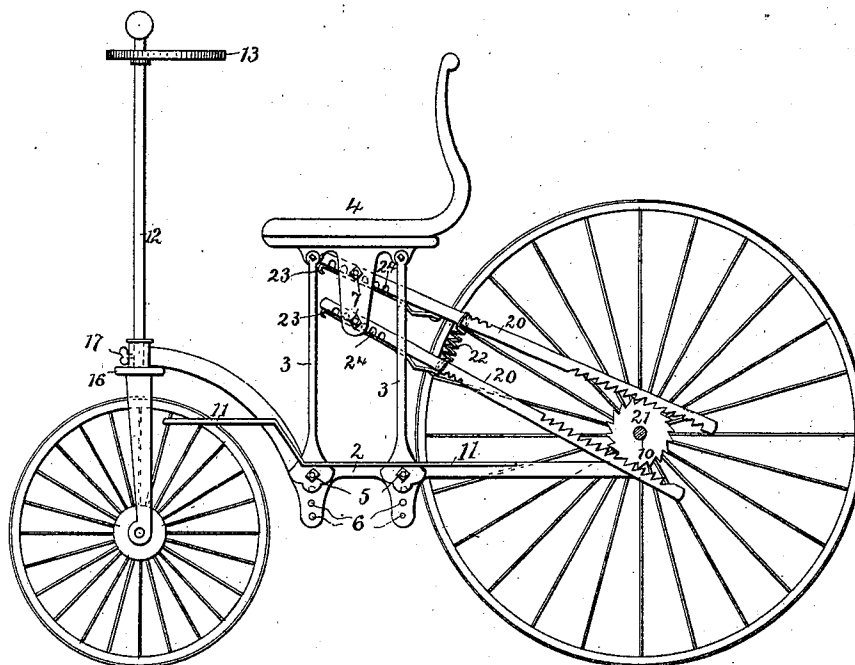


FIG. IV.

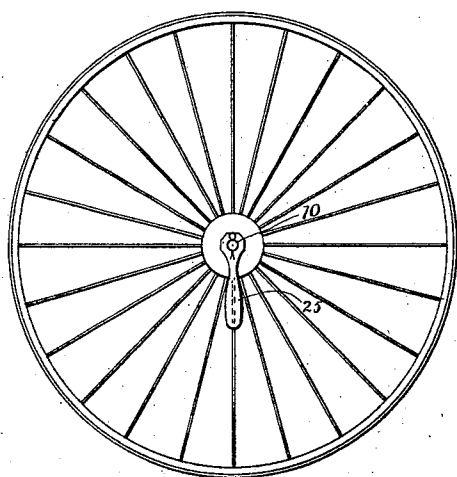


FIG. V.

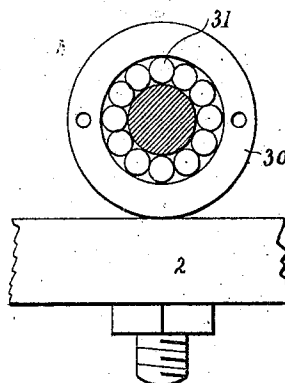
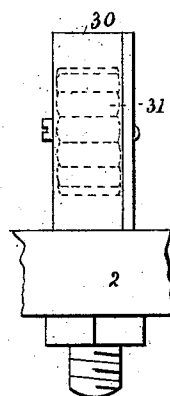


FIG. VI.



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UNITED STATES PATENT OFFICE.

CAMILLO KRAMER, OF ALBANY, NEW YORK.

VELOCIPEDE.

SPECIFICATION forming part of Letters Patent No. 355,324, dated January 4, 1887.

Application filed October 12, 1886. Serial No. 216,011. (No model.)

To all whom it may concern:

Be it known that I, CAMILLO KRAMER, of Albany, in the county of Albany and State of New York, have invented a new and useful
5 Improvement in Velocipedes and Similar Vehicles, which improvement is fully set forth in the following specification.

This invention has reference more particularly to vehicles of the velocipede class, which
10 are propelled by the person or persons riding thereon. As commonly constructed, bicycles, tricycles, and like vehicles are constructed to be propelled by the motion of the rider's legs, though some vehicles of this class are worked
15 by the rider's arms.

It has been proposed heretofore to derive the power for propelling the vehicle from the motion of the rider's body, and attempts have been made to construct vehicles on this principle. Velocipedes for children having the design of a hobby-horse have been made or
20 proposed, the body of the horse being hinged at one end to the frame, so as to be capable of oscillating up and down, and the driving-wheels being connected with the body by means of cranks and connecting-rods or other operating mechanism. Such a vehicle is not suitable for practical use, as it can only be propelled with extreme difficulty and by violent
30 exertion. The motion of the oscillating part is very irregular and jerky. The weight being all on one side of the center of oscillation, the downward motion is performed very easily, while the upward motion, in which it is required to raise all the weight of the rider and that of the seat, is accomplished very slowly and with great difficulty. It has been proposed heretofore to overcome this difficulty by constructing and mounting the seat in such
40 manner that its oscillation is approximately horizontal, and it is to velocipedes of this latter construction that the present invention more particularly relates.

The object of the present invention is the
45 construction of an entirely practical road-vehicle which shall receive its motion from the rocking or swaying of the chair or saddle upon which the rider sits, and in which the motion of the seat shall be even and uniform.

50 According to the present invention the seat is so constructed and supported that its motion

is back and forth instead of up and down—that is to say, the chord of the arc through which the seat moves is horizontal instead of vertical, or nearly so. The seat, moreover, is supported
55 some distance above the center of oscillation, which diminishes the difficulty of operating the device. It is immaterial whether the seat be pivoted to the frame or mounted thereon by rockers like those of a rocking-chair. Preferably the seat is adjustably secured to the frame, so that it can be moved up and down, as desired. It may be in the form of a chair or saddle, or of other form, and adapted for one or for any greater number of persons. The
65 seat may be connected with the driving-shaft by cranks and connection-rods or by other suitable means. Preferably I employ toothed driving-bars, which engage a toothed or ratchet-wheel on the driving-shaft. With such
70 a connection the wheels can turn independently of the motion of the chair. Moreover, the rider can rock a longer or shorter distance, as he may prefer. He can run downhill with the seat stationary, and can allow the vehicle at any
75 time to run on by its own momentum. The connection between the seat and driving-shaft is also adjustable.

The seat may be supported on two centers of oscillation instead of on a single one. The seat
80 can in this case be made of any desired length, to hold two or more persons, one behind the other, in a straddling position; or several chairs may be carried by an oscillating frame so supported. In this case, moreover, the seat does
85 not tilt, but is always kept horizontal.

The invention includes certain other new features and combinations of parts, as hereinafter set forth.

I have found in practice that a vehicle constructed in accordance with my invention can
90 be driven at a good speed with little difficulty or fatigue. It is, moreover, suitable for persons who cannot or do not wish to use an ordinary bicycle or tricycle.

In the accompanying drawings, Figure I is a side view of a tricycle constructed in accordance with the invention, one of the driving-wheels being removed. Fig. II is a partial plan view of the vehicle shown in Fig. I, the
100 seat being removed. Fig. III is a view similar to Fig. I, illustrating a somewhat different

structure. Fig. IV is a detail of the driving shaft, showing device for locking the wheel to the shaft; and Figs. V and VI are details showing the construction of the axle-bearings.

5 The frame-work 2 of the vehicle is formed of iron castings of suitable shape to support the working parts. To this frame are pivoted the standards or uprights 3 of the seat or chair 4 by means of the rod or bolt 5. There are
10 several holes, 6, one above the other, in the frame for the insertion of bolt 5, so that the standards can be raised or lowered to adjust the chair to the desired height. The chair 4 can oscillate freely on the bolt 5 as a center.
15 Just beneath the chair is another bolt or rod, 7, which passes loosely through the end of a driving-rod or pitman, 8, connected at its other end with the crank 9 on the driving-shaft 10.

20 Around the sides of the frame is a platform, 11, which serves as a foot-rest, and also aids in mounting. This platform is preferably an open-work casting, which is light, and at the same time affords a firm foothold.

25 The steering-rod 12 has a handle, 13, somewhat ring-shaped, so that it can be steered with one hand. As shown, there are two driving-wheels and one steering-wheel; but of course there may be two steering-wheels and one driving-wheel.
30

In operation, the rider braces himself firmly with his hands and feet and sways the body backward and forward, the movement of the seat being communicated to the driving-wheels
35 14 through the rod or pitman 8 and crank 9. The motion is nearly horizontal, and is first to one side and then the other of the center of oscillation. By this construction the vehicle can be driven with ease and regularity. To
40 assist the forward movement, which is somewhat more difficult than the backward movement, a spring, 15, is secured to the frame, and bears at its free end against the seat 4.

Between the frame 2 and a collar on the steering-rod is a spring, 16, which may be rubber or a spiral spring. A set-screw, 17, is provided at this part to fix the rod in one position, to steer a straight course or a circular one of any radius.

50 In addition to the adjustable connection between the seat and frame, the pitman 8 is adjustably secured to the crank 9. The pitman is provided, near its end, with a number of grooves, 24, and the crank may pass through
55 any one of these, being held therein by the flat spring 23. To lengthen or shorten the pitman, the spring is depressed and the crank placed in one of the other grooves.

60 In Fig. III the seat is supported on two axes instead of one, there being four uprights or standards, 3, two on each side. These standards are adjustably connected to the frame, as before. By this means it is possible to mount
65 several seats or saddles, one behind the other, on the oscillating frame, the foot-rest or platform 11 extending around the sides of the frame, so as to furnish a support and brace for

the feet of several persons. Moreover, it is obvious that a seat mounted on an oscillating frame having two axes in different vertical
70 planes always maintains a position parallel to the surface of the ground.

Instead of cranks and connection-rods, as in Figs. I and II, the vehicle is propelled by two driving rods or bars, 20, which are connected
75 loosely at their upper ends to the oscillating frame of the seat 4. These rods 20 are toothed at their lower ends and engage with a toothed or ratchet wheel, 21, on the driving-shaft 10. The driving-rods 20 are held in engagement
80 with the wheel 21 by the spring 22, the effective pressure of which can be increased or diminished by moving it toward or away from the wheel 21. When the seat 4 rocks forward,
85 the teeth on the upper rod engage the wheel 21, rotating the shaft 10, and the teeth on the lower rod slip over those of the wheel, the rod being permitted by spring 22 to yield sufficiently. When the seat moves backward, the
90 lower rod engages the wheel and rotates the shaft. In this connection there are no dead-centers. The rider can make as long or as short a movement as he chooses, and is not limited to a path of fixed length. Moreover, by
95 a forcible motion the vehicle can be given an impetus and then allowed to run by its own momentum, the chair being stationary, and in running downhill the rider can sit motionless. With the crank-connection the chair and
100 rider must, of course, always follow the motion of the cranks. The rods 20 are adjustably connected to the bolts 7 by means of the spring 23 and grooves 24 in the rod, the connection being similar to that of the driving-rod and crank in Fig. I.
105

Referring to Fig. IV, the driving-wheel 14 is detachably secured to the shaft 10 by the device 25, which consists of a nut and handle in one piece. Ordinarily the handle is turned
110 so as to clamp the wheel against a shoulder on the shaft, so that both turn together. If desired, however, for any purpose—as in going downhill, or if the vehicle is to be pushed or otherwise propelled without the action of the
115 rider—a single turn of the handle releases the wheel, so that the shaft becomes stationary. When locked, the handle of the device is arranged to counterbalance the crank. When released, the weight of the handle prevents
120 its turning with the wheel and unscrewing, as would be the case with an ordinary nut.

I prefer to lock only one wheel to the shaft, if there be two driving-wheels, as the vehicle can then more easily make short turns, during
125 which one of the wheels has a tendency to turn backward while the other turns forward.

Figs. V and VI illustrate a form of anti-friction bearing that I prefer to employ. The journal-box 30 (shown open in Fig. V) is bolted
130 or otherwise secured to the frame 2. It consists of a cylindrical casting, the shaft 10 passing through the center. The shaft is completely encircled by anti-friction rollers 31, placed loosely in the box 30. These rollers

are cylindrical, with rounded ends, to reduce the friction between them and the front and back of the box.

It is obvious that the construction may be modified in particular so other than those pointed out without departing from the spirit of the invention, and that parts of the invention may be used without others.

I claim—

1. The combination of the frame, the driving-shaft, and the oscillating seat connected therewith, said seat being adjustably secured to said frame, substantially as described.

2. The combination of the frame, the rocking seat, the driving-shaft, and the connections comprising driving-rods adjustably connecting said seat and shaft, substantially as described.

3. The combination of the frame, the oscillating seat adjustably secured thereto, the driving-shaft, and connections comprising a driving rod or rods adjustably connecting said seat and shaft, substantially as described.

4. The combination of the frame, the driving-shaft, the pivoted seat connected with said shaft, as specified, and the stationary foot-rest or platform extending around the sides of the frame, substantially as described.

5. The combination of the frame, the seat pivotally supported thereon, the driving-shaft, and operating connections between said seat and shaft, comprising a driving-rod having a number of grooves near the end and a retaining-spring, substantially as described.

6. The combination of the frame, pivoted seat, driving-shaft, ratchet-wheel on said shaft, and driving mechanism comprising two toothed rods connected with said seat and held in engagement with said ratchet-wheel on opposite sides thereof with yielding or spring pressure, the teeth on said rods being inclined in opposite directions, substantially as described.

7. The combination, with the driving-shaft, of a seat carried by an oscillating support having two axes of oscillation and operating mechanism connecting said seat and shaft, substantially as described.

8. In a velocipede, the combination, with the driving-shaft and driving mechanism for imparting motion thereto, of a driving-wheel and a locking device comprising a nut and handle for securing said wheel to said shaft, whereby the wheel may be rotated by said driving mechanism, and for releasing said wheel from the shaft, whereby it may rotate independently of said mechanism, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

CAMILLO KRAMER.

Witnesses:

ANDREW AMENDZ,
JOHN ZWICK.