No. 647,787. Patented Apr. 17, 1900.

J. C. ANDERSON.

MULTICYCLE VEHICLE.

(Application filed Aug. 16, 1899.)

(No Model.) 2 Sheets—Sheet 1.

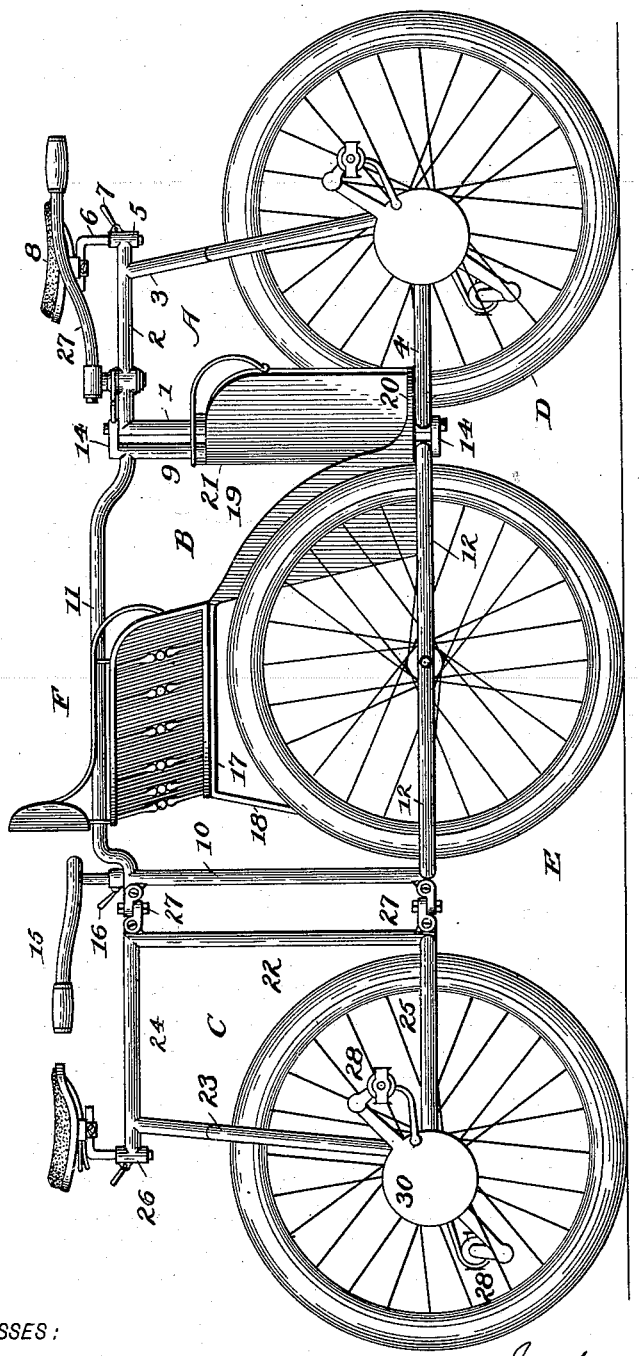

Fig. 1

WITNESSES:

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Wallace Murdock

INVENTOR

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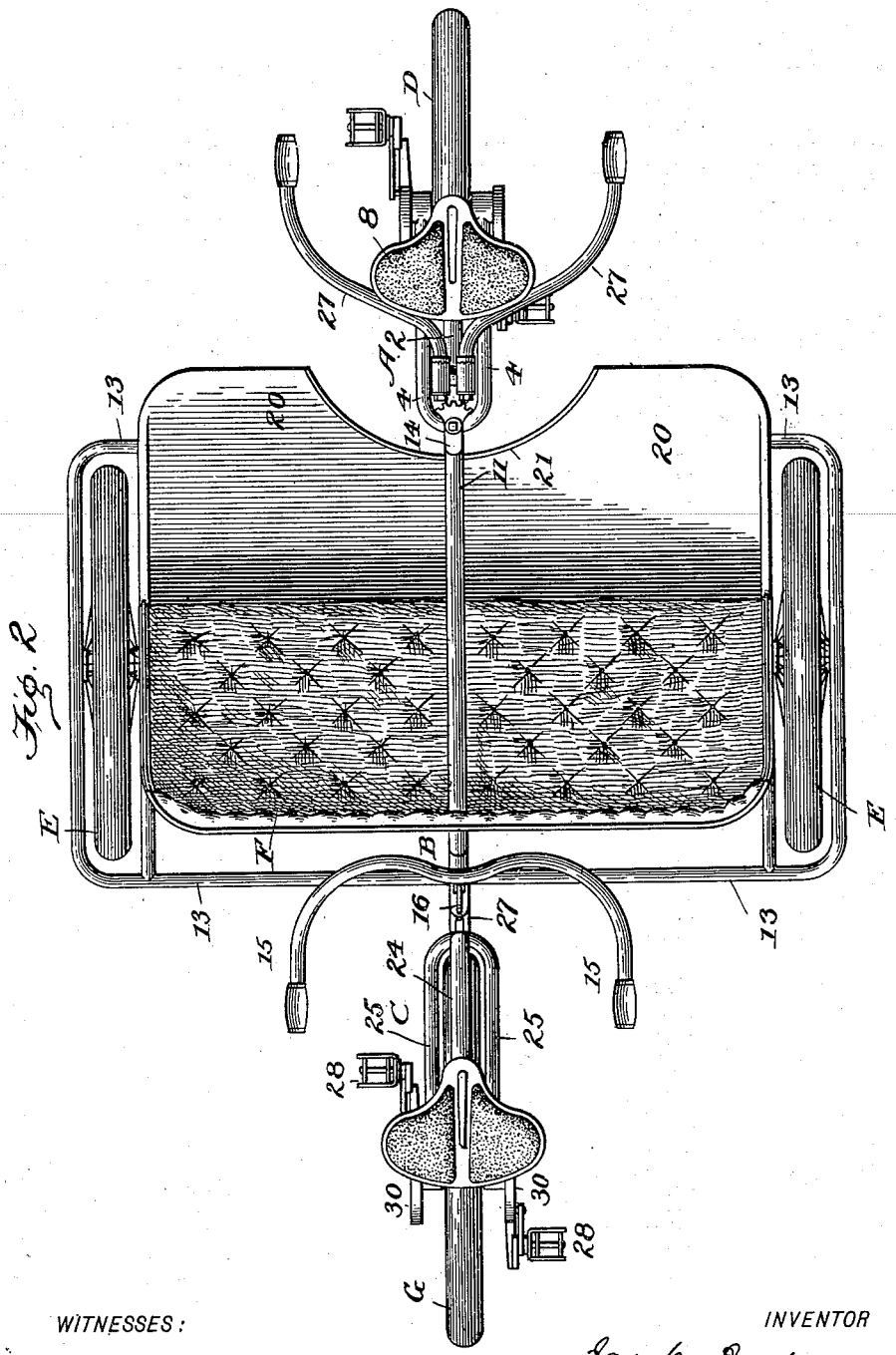

Fig. 2

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JAMES C. ANDERSON, OF HIGHLAND PARK, ILLINOIS.

MULTICYCLE VEHICLE.

SPECIFICATION forming part of Letters Patent No. 647,787, dated April 17, 1900.

Application filed August 16, 1899. Serial No. 727,386. (No model.)

To all whom it may concern:

Be it known that I, JAMES C. ANDERSON, a citizen of the United States, residing at Highland Park, in the county of Lake and State of Illinois, have invented certain new and useful Improvements in Multicycle Vehicles; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to certain new and useful improvements in cycle construction, and has for its object the production of a machine adapted to be propelled by the human motive force of one or more riders through the medium of driving-wheels and having also provision for carrying two or more passengers without physical exertion on their part. In other words, my invention is designed to evolve in cycle construction a progress analogous to the evolution made in ordinary carriages and out of which has grown the automobile or horseless carriage, in which a passenger is carried without the use of a draft-animal. In my suggested bicycle evolution it is designed to carry passengers upon a cycle without physical exertion of the passenger by utilizing the motive force of a working rider. In all cycles with which I am familiar and which are adapted to carry two or more persons each and every person carried by such a wheel is required to lend physical exertion toward the propulsion of the machine.

My invention has for a further object to provide for the maintenance of the equilibrium of the machine while the passengers mount or alight and at the same time to avoid any undue tractive friction.

My improved machine is especially adapted for dispensing hospitality and sociability in cycle-riding and is peculiarly fitted for use and enjoyment by invalids. It is also well adapted for and may be employed in the same service and to the same extent as the ordinary public cab or carriage, and with these ends in view my invention consists in the construction and arrangement hereinafter and more fully set forth.

In order that those skilled in the art to which my invention appertains may know how to make and use my improved cycle and fully appreciate all of its advantages; I will proceed to describe the same, referring by letters and figures to the accompanying drawings, in which—

Figure 1 is a side elevation of my improved vehicle, and Fig. 2 is a top or plan view of the same.

Similar letters and figures of reference denote like parts in both figures of the drawings.

In the preferred form of construction the combined vehicle is composed of three frames, (designated generically by the letters A B C, respectively, from front to rear.)

The frame A is of substantially **A** form and consists of a rear vertical tube 1 and upper horizontal tube 2, a front slightly-oblique fork 3, and a lower horizontal fork 4.

The front driving-wheel D is mounted in ball-bearings between the lower ends and junctures of the forks 3 and 4 in the usual manner, and all fittings are likewise made in the ordinary manner.

The upper frame-tube 2 is extended forwardly and fitted with a vertical **T**-joint 5 to receive the saddle-post 6, which is held in any adjusted position by a clamping-lever 7. The saddle 8 is mounted adjustably upon the saddle-post 6 in any preferred manner.

The rear vertical tube 1 is open at both ends to receive a pintle-rod and ball-bearings, such as described and illustrated in a pending application for tandem bicycle filed by me on the 9th day of August, 1899, Serial No. 726,693.

The second or passenger frame B is composed of a front vertical tube 9, a rear vertical tube 10, upper horizontal tube 11, and two lower fork-frames 12, the ends of which are connected by tubes 13 to the front and rear vertical tubes 9 and 10. (See Fig. 2.) The front vertical tube 9 is provided with radial lugs 14, adapted to embrace the ends of the rear vertical tube 1 of the frame A and to be pivotally connected thereto by a pintle-rod and ball-bearings, as explained in pending application hereinbefore referred to.

What I term "idler-wheels" E are mounted in ball-bearings within the fork-frames 12 of the frame B and constitute the independent pivotal supports for said frames. The upper

horizontal tube 11 is raised upwardly from each end a distance sufficient to clear the passenger-seat presently referred to.

The rear vertical tube 10 has adjustably secured in the upper end thereof a handle-bar 15, which is clamped in position by an ordinary hand-lever 16.

Mounted upon and connected with the inside tubes of the two lower fork-frames 12 are the passenger-seat frames, composed of very light tubing (owing to the fact they support the weight in a vertical direction) and consisting of a horizontal tube 17 and front and rear leg-tubes 18, the front one in Fig. 1 being concealed by a mud-guard, presently referred to. The seat-frames at the angles or juncture between the tubes 17 and 18 are braced and held in parallelism by cross-tubes, (not shown,) and, if deemed desirable, other bracing-tubes may be employed at any suitable plane below the seat, though the construction described is deemed of sufficient strength.

F is a seat composed of any suitable material of light weight and secured in any preferred way to the tops of the seat-frames just described. 19 are wheel-guards of suitably-light material connected with the front vertical tube of the seat-frame and at their base to a light footboard 20. (See Fig. 2.) This footboard is supported at the front upon the forward cross-tubes 13 of the frame B and at each end upon the inside tubes of the horizontal fork-frames 12 and is attached permanently or removably to the respective tubes in any preferred manner. The footboard is cut out on the front edge in the arc of a circle, as shown at Fig. 2, to permit articulative movement of the front frame A. A dash-board 21, also of light material, curved correspondingly with the front of the footboard 20, is connected centrally in any suitable manner to the front vertical tube 9 and rests upon the footboard 20.

The rear frame C is composed of a front vertical tube 22, a rear oblique fork 23, an upper horizontal tube 24, and a lower horizontal fork 25. The design of the frame is the reverse of the frame A, so that when the three frames are connected, as shown at Fig. 1, the machine as a whole will have a pleasing design. The upper tube 24 is extended rearwardly and is provided with a vertical T-joint 26, supporting a saddle-post and saddle in the same manner as shown in frame A. This frame C is mounted upon a driving-wheel G in the same manner that the forward frame A is mounted upon its driving-wheel D.

The frames B and C are articulatively connected through the medium of double-acting joints constructed and operating in an obvious manner to give vertical and lateral articulation, as described in another pending application filed by me on the 9th day of August, 1899, Serial No. 726,692, for improvement in multicycles. The front frame A is provided with a pivotal handle-bar 27, mounted in ball-bearings and connected through the medium of a segmental gear with a similar gear extending from the upper lug 14 of the tube 9 of the frame B in the manner described and shown in the pending application first referred to.

The driving mechanism employed in connection with the driving-wheels D and G, mounted in frames A and C, consists of extension-pedals 28, as shown in a pending application filed by me December 16, 1897, Serial No. 662,233, for improvement in crank and pedal mechanism, cranks 29, and crank-gears 30, as shown and described in an application filed by me on the 9th day of August, 1899, Serial No. 726,694, for improvement in bicycles for use in the military service, and the riders mounted upon the saddles occupy such relation to the driving mechanism as to be able to apply their physical force to the best advantage, as shown and described in the before-recited pending application on tandem bicycles.

From the construction shown and described it will be seen that the frame C may be removed by removing or disconnecting the articulative connections 27, thus leaving the frames A and B to constitute a tricycle having central articulation and capable of carrying two passenger riders and one working or propelling rider instead of two of the latter when the machine is in the form shown at Figs. 1 and 2. If desired and after removal of the frame C, one or more frames similar to the frame B may be connected together and the frame C then secured articulatively to the last frame B, and thus the capacity may be increased to any extent proportioned to the physical ability of the riders mounted over the driving-wheels, and it will also be observed that the front frame A may be removed, leaving the frames B and C in the form of a tricycle, with the working or propelling rider in the rear, and able, through the handle-bar 15 and articulative joints 27, to properly steer the machine.

In the form shown in the drawings it will be seen that the rider on frame A articulates the frames A and B on the pivotal connection between said frames and that by reason of the rigid handle-bar 15, connected to the rear of frame B, and its articulative connection with frame C the rider mounted on said frame C articulates the frames B and C upon their pivotal connection. Hence all of the wheels become steering-wheels, and the machine may be turned promptly on short radii.

In a machine such as shown and having a capacity for carrying four persons only two pedaling and driving mechanisms are required, while in the ordinary machine adapted to carry a similar number of persons four pedaling and driving mechanisms would be necessary. This advantage in the case of my improved machine is due to two circumstances in construction. First, the passenger riders are mounted over what I have termed

"idler-wheels," to which no driving mechanism is secured, and, second, the working riders on frames A and C, being mounted directly over the driving-wheel and the latter being provided with the peculiar driving-gears, cranks, and extension-pedals, as fully described in the two pending applications referred to, are enabled to exert fully twice the power that can be exerted by a rider mounted upon a wheel as at present constructed, both as to relation between the rider and the axis of the driving-wheel and likewise the character of the ordinary crank-and-pedal mechanism. It will be further observed that the four wheels are so disposed that the machine will be sustained in equilibrium when it is in a state of rest, and hence the occupants can take their respective positions or places or dismount with perfect ease and safety, and that with the articulative connection between the several frames the machine may be turned without undue friction, and it will also be observed, and I desire to lay stress upon the fact, that no wheel is in gear with any other wheel, but that all have independent rotative action upon their respective axles and in turning corners may have differential speeds with obvious benefits and that the driving-wheels and idler-wheels are so disposed relatively to each other that the idler-wheels constitute supports in planes outside of and parallel with the supporting-planes of the driving-wheels, or, in other words, lines drawn between the four points of contact of the wheels shown in the drawings would constitute a diagram of diamond form, and that the passenger-seat becomes practically a pivotal center of the machine.

The many uses to which my improved machine may be applied will be readily appreciated. For instance, any two riders mounted upon the frames A and C may invite friends to occupy seats on frame B and take a ride without any physical exertion. The machine either in dual or multiple form may be employed as a public conveyance in the same manner and for the same purposes as the ordinary cab or carriage as at present used with draft-animals.

It will be understood that I contemplate the use of mud-guards whenever they may be desirable or necessary.

Having described the construction and arrangement of my improved vehicle and its many advantages, what I claim as new, and desire to secure by Letters Patent, is—

1. A cycle composed of one or more frames provided with a saddle and mounted upon a single wheel having propelling mechanism, and one or more frames, each mounted upon two wheels located in substantially the same axial line, each side of the center, articulative joints between said frames, and steering mechanism for controlling the articulations, substantially as hereinbefore set forth.

2. A cycle composed of one or more frames, each mounted upon a single driving-wheel with means for driving said wheel, and one or more frames provided with seats and pivotally and centrally mounted upon two carrying-wheels; and steering mechanism for controlling the articulations of the several frames, substantially as hereinbefore set forth.

3. In combination with the rectangular frame B mounted centrally upon two carrying-wheels and provided with a seat F over the axes of the wheels and with a rigid handle-bar 15, in rear of the seat, a frame C mounted vibratively at its lower rear end upon the driving-wheel and provided with a saddle over the axis of the driving-wheel, a single driving-wheel G provided with propelling mechanism and articulative joints 27, connected vibratively at each end to the frames B and C, respectively whereby the rider upon the rear frame is enabled to steer the forward frame, substantially as and for the purposes set forth.

4. In combination with the frames A and B, articulatively connected and mounted upon the driving-wheel D and carrying-wheels E, respectively and provided with handle-bars 8 and 15, the frame C mounted vibratively at its rear end upon a driving-wheel G and provided with suitable driving mechanism, and articulative connections between the frames B and C, substantially as and for the purposes set forth.

5. In combination with the frame B composed of the rear vertical tube 10, upper horizontal tube 11, front vertical tube 9, lower double fork-tube 12, and cross-tubes 13, all rigidly connected together and mounted centrally upon driving-wheels E, the secondary seat-frame composed of the tubes 17 and 18, joined together and mounted upon and secured to the inside members of the fork-tubes 12 of the frame B and a seat F, mounted upon the secondary seat-frame, substantially as shown and described.

6. In combination with the frame B, consisting of the rear vertical tube 10, upper horizontal tube 11, front vertical tube 9, lower double fork-tube 12, and cross-tubes 13, all rigidly secured together and mounted centrally upon two carrying-wheels E, and the secondary frame consisting of tubes 17 and 18, connected together and rigidly mounted upon the fork-tubes 12, and provided with a seat F, a footboard 20, mounted upon the forward end of the fork-tubes 12, and the forward cross-tube 13 of the frame B, substantially as shown and described.

7. In combination with the frame B, consisting of the rear vertical tube 10, upper horizontal tube 11, front vertical tube 9, lower double fork-tube 12, and cross-tubes 13, all rigidly connected together and mounted centrally upon carrying-wheels E, and the secondary seat-frame consisting of tubes 17 and 18, rigidly connected together and to the inside member of the fork-tube 12, of the frame B, and provided with a seat F, a foot-

board 20, secured to the ends of the fork-tubes 12, of the frame B, and a dash 21, secured to the front tube 9, and supported upon the footboard 20, substantially as shown and described.

8. In combination with a cab-frame mounted centrally upon a single carrying-wheel and a seat-frame and seat mounted upon said cab-frame, and a leading or front frame mounted upon a driving and steering wheel provided with driving and steering mechanism, and articulatively connected with the cab-frame close to the peripheries of the carrying and the steering wheels, a footboard 20, and a curved "dash" 21, mounted upon the cab-frame and extending forwardly at each terminal, whereby the steering-wheel may rotate upon its steering-pivot, and the passenger on the cab-seat may be protected substantially as hereinbefore described.

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

JAMES C. ANDERSON.

Witnesses:
JENNIE G. BOOTH,
WALLACE MURDOCK.