No. 648,718.

Patented May 1, 1900.

J. C. ANDERSON.

PACING CYCLE.

(Application filed Aug. 25, 1899.)

(No Model.)

3 Sheets—Sheet 1.

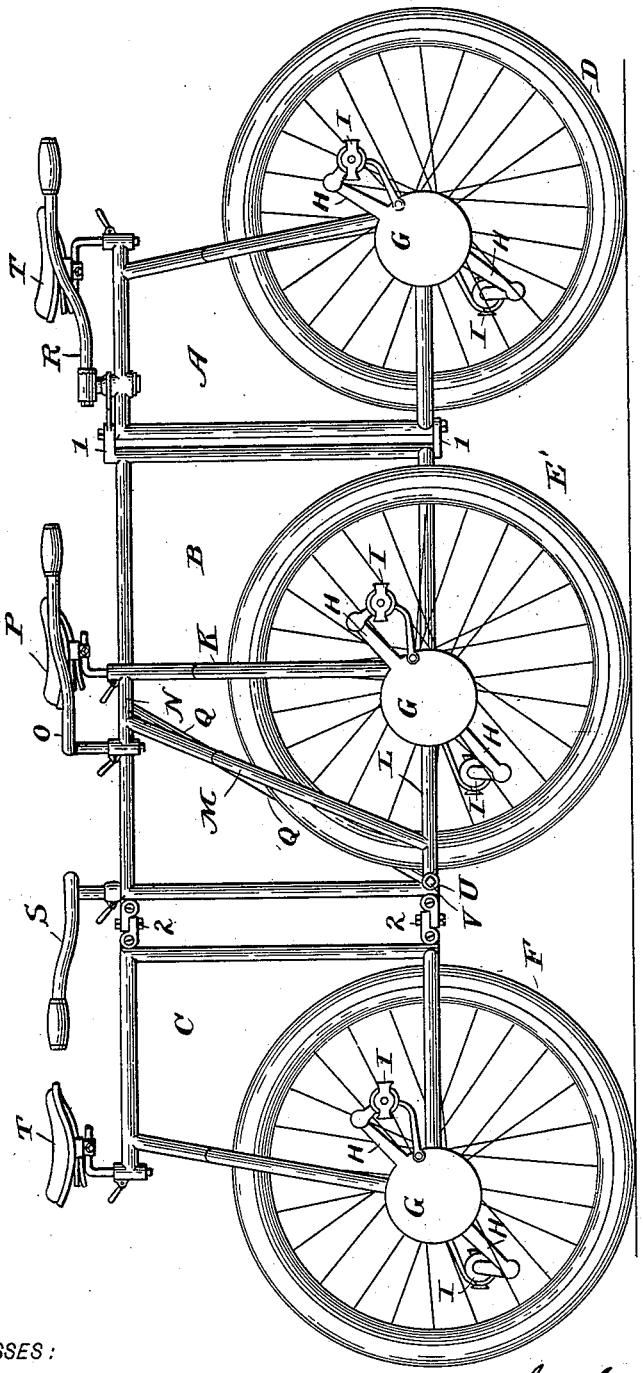


Fig. 1.

WITNESSES:

Edwin L. Bradford

Wallace Muscdock

INVENTOR

Jas. C. Anderson

BY

Wm. C. W. Intie

ATTORNEY

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

No. 648,718. Patented May 1, 1900.

J. C. ANDERSON.

PACING CYCLE.

(Application filed Aug. 25, 1899.)

(No Model.) 3 Sheets—Sheet 2.

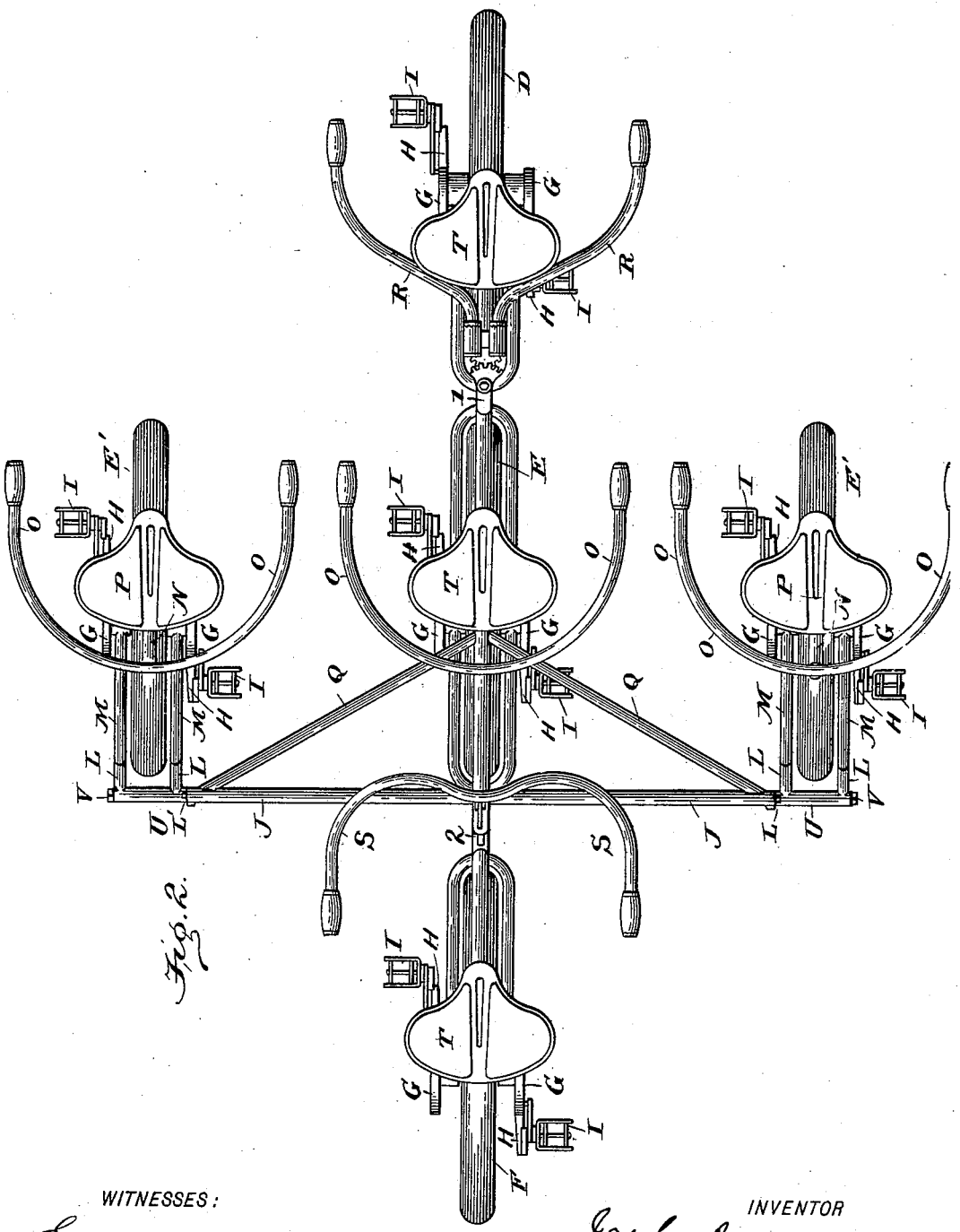


Fig. 2.

WITNESSES:

Edwin L. Bradford

Wallace Murdock

INVENTOR

Jas. C. Anderson

BY

Wm. C. W. Irvine

ATTORNEY

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

No. 648,718. Patented May 1, 1900.

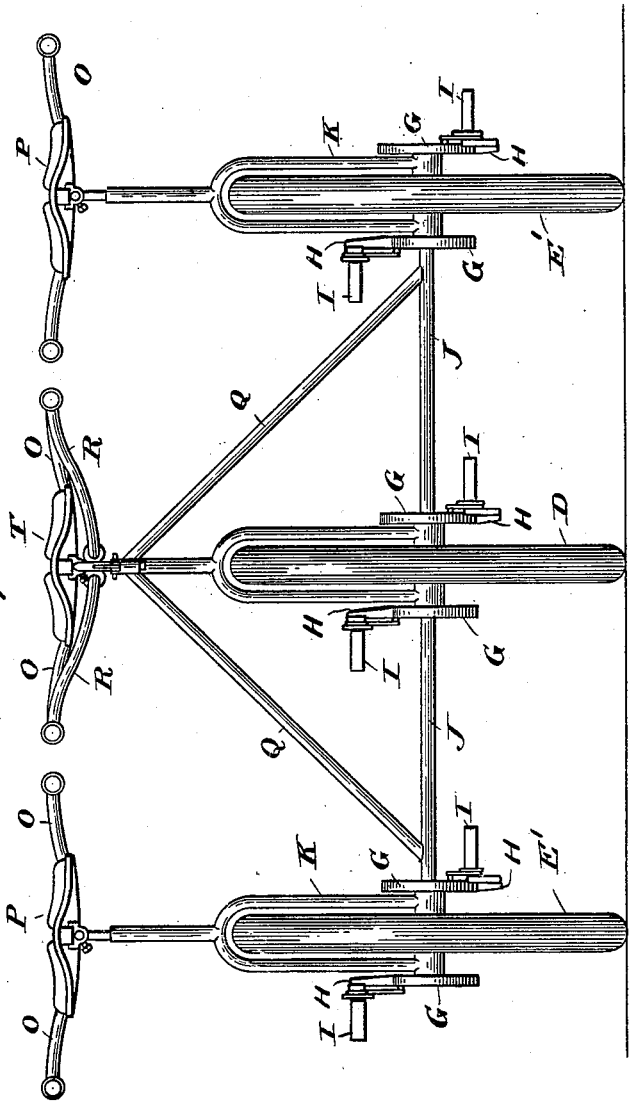
J. C. ANDERSON.

PACING CYCLE.

(Application filed Aug. 25, 1899.)

(No Model.) 3 Sheets—Sheet 3.

Fig. 3.



WITNESSES:

Edwin L. Bradford
Wallace Murdock

INVENTOR

Jas. C. Anderson
BY
Wm. C. W. Sutton
ATTORNEY

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

UNITED STATES PATENT OFFICE.

JAMES C. ANDERSON, OF HIGHLAND PARK, ILLINOIS.

PACING-CYCLE.

SPECIFICATION forming part of Letters Patent No. 648,718, dated May 1, 1900.

Application filed August 25, 1899. Serial No. 728,441. (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 Pacing-Cycles; 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 to provide a machine which while it may be used satisfactorily for pleasure and other riding shall be especially adapted for "pacing" purposes.

The main purpose of a pacing-machine is to make a "hole in the air," as it were, in advance of the rider who is endeavoring to make fast time, and hence two things are essentially important—first, to have the pacing-machine sufficiently broad to leave a large enough "hole in the air" or vacuum for the paced rider to enter and move within, and, second, to secure the greatest amount of propelling force commensurate with the resistance offered by the atmosphere to the riders and the pacing-machine upon which they are mounted. My improved machine is especially adapted to secure these ends; and it consists of a main backbone-frame made up of three sections articulatively connected, each mounted upon an independent driving-wheel provided with driving mechanism and each frame provided with a saddle and suitable handle-bars and two articulative frames lateral to the central section of the backbone-frame and each provided with a saddle and handle-bar and mounted upon a driving-wheel provided with driving mechanism, so that the horizontal plane within the straightest lines constituting a boundary around the riders will be of diamond form, all as will be hereinafter and more fully described.

In order that those skilled in the art to which my invention appertains may fully understand the same, I will proceed to describe the construction and operation of my improved pacing-machine and incidentally explain its many advantages, referring by letters and numerals to the accompanying drawings, in which—

Figure 1 is a side elevation of one of my improved machines. Fig. 2 is a top or plan view of the same, and Fig. 3 a front elevation.

Similar letters and numerals of reference indicate like parts in the several figures of the drawings.

A B C are three frames, each mounted upon independent driving-wheels D E F, respectively, and each provided with specially-designed driving mechanism consisting of a crank-gear G, crank H, and extension-pedal I, the three frames connected by articulating joints 1 1 and 2 2, all as fully described in a pending application filed by me on the 9th day of August, 1899, Serial No. 726,692, for "Improvements in multicycles." These three frames A B C, constructed and arranged together, as shown, I denominate, collectively, as the "backbone-frame" of my present construction. Extending laterally each side from the lower rear corner is a continuous tube J, to each end of which are pivoted in ball-bearings two lateral frames consisting of a vertical fork K, a lower horizontal fork L, an oblique rear fork M, and a short upper horizontal tube N, constituting a frame of substantially A form, as best shown at Fig. 1. Between the bifurcated ends of the forks L wheels E' are mounted in suitable ball-bearings, which are driven by mechanism similar to that employed for driving the wheels D, E, and F heretofore described.

Mounted in a suitable T-joint at the rear of the tube N are vertically-adjustable handle-bars O within proper reach of the riders mounted upon the saddles P on the lateral frames.

Q Q are brace-tubes extending from the continuous horizontal laterally-extended tube J to the upper backbone-tube of the central frame B to constitute tie-rods between said backbone and the outer ends of the tube J.

A pivoted and adjustable handle-bar R is secured to the backbone of frame A and is connected through the medium of segmental or fantail gears with the articulative joint of the frame B, as shown and described in the pending application hereinbefore referred to,

and S is a rigidly-adjustable handle-bar secured to the rear end of the backbone of frame B to be in reach of and operated by the rider mounted on saddles T of frame C, also as described in the pending case referred to.

The lower horizontal forks L of the two lateral frames have their rear ends (either joined together or separately) firmly united to suitable hubs U, which are journaled upon axles or spindles projecting from the ends of the tube J and are secured in place thereon by nuts V, and, if desirable, any suitable constructed ball-bearings may be interposed between the hubs U and the axle, and to limit the upward movement of each of the lateral or wing frames lugs or shoulders L′ (shown at Fig. 1) are provided on the tube J and hubs U. This is an important feature of construction, because while permitting sufficient vibration of the forks L to adapt the wing-wheels to the lateral pitch of the road or track, and especially in making turns, the shoulders L′ limit this movement to within the safety point, and the lateral frames and wheels constitute safety appliances for preventing the machine as a whole from falling or being thrown by centrifugal force.

By special reference to Figs. 1 and 2 it will be seen that the rear oblique tubes M of the lateral frames are of fork form, merging into a single tube a short distance before the point of juncture with the short upper horizontal tube N, and consequently they, like the front-fork tubes K, have a bearing each side of the wheel E′ upon the horizontal fork L, thus rendering the frame as a whole stiff and strong.

From the construction shown and described and by special reference to Fig. 2 it will be seen that when the three riders are mounted upon the saddles T on the backbone of the sectional frame and the two outside riders are mounted upon the saddles P on the lateral frames the forward and rear riders upon the backbone and through the medium of the handle-bars R and S readily articulate the sections A and C and also coöperate with each other in articulating the intermediate section B and the lateral frames connected to the ends of tube J, the wheels of which operate as casters, because each and every one is an independent driver, and the three parallel frames can move around a curve in substantially the same manner that a military company executes the movement known as a "wheel." It will also be seen that while I am enabled by my construction to secure the full and independent propelling power of five riders their combined motive force is applied with increased advantage as a group of riders on a single machine, and the arrangement of the group of riders in the form of a diamond enables them to cleave the air with facility and at the same time present a broader surface than would be presented by an ordinary pacing-machine, and thus they provide for the racer following the machine a much more perfect vacuum to ride in, and as a result of the broader avenue of vacuum the air in its effort to fill the vacuum behind the racer operates as a constantly-impacting force to aid his forward movement.

I desire to call particular attention to the fact that by reason of the two lateral or wing wheels and frames having the horizontally-arranged articulative joint and being arranged in the same cross plane with the central wheel of the main or backbone frame enables the machine as a whole to adapt itself to the many inequalities which are necessarily found in an ordinary roadway or racing-track both longitudinally and transversely, and, as before stated, they constitute absolute safety devices for preventing the machine from being thrown by centrifugal force. These advantages arise from the fact, generically stated, that the machine has in the same axial line at (substantially speaking) the center of the frame three independent driving-wheels, all of which have independent vertical movement. The center wheel has its independent vertical movement through the medium of the articulative joints between the frames and the wing-wheels have vertical movement through the medium of the pivoted and vibrating forks L.

While I have shown and prefer the construction involving three frames equipped for riding and each mounted upon a single driving-wheel and two lateral or wing frames pivotally connected at the lower corners of their rear ends to lateral supports extending from the central section of the backbone-frame, it will be understood that I may in like manner, as shown, increase the length of the main or backbone frame by adding sections similar to section B and that I may also add lateral frames to one or more sections B, as described. This construction is particularly desirable for use in the military service or where necessary to transport a comparatively-large number of men from one point to another quickly, and as the machine is adapted to maintain its equilibrium both in motion and when at rest it will be seen that the riders need not be experts.

It will be seen that each additional backbone-section with two lateral or wing sections increases the carrying capacity by three and that under all circumstances each rider applies his physical force independently of all the other riders, while at the same time their combined efforts all harmonize to give great power and speed to the machine as a whole on the same principle that the individual draft-power of a horse is utilized to better advantage by coöperation with a mate.

Having described the construction, operation, and advantages of my improved machine, what I claim as new, and desire to secure by Letters Patent, is—

1. A pacing-cycle composed of a backbone-frame consisting of three or more sections, each equipped with a single driving-wheel, driving mechanism, and a saddle; and artic-

ulatively connected together, lateral or wing frames, mounted upon a single driving-wheel, provided with driving mechanism, a saddle and handle-bar, said frames pivotally connected at each end of a lateral extension from the main frame and adapted to vertical movement independently of each other and the main or backbone frame, substantially as and for the purposes set forth.

2. A pacing-machine composed of a sectional articulating backbone-frame equipped with independent driving-wheels and driving mechanism, saddles, handle-bars, and steering mechanism, lateral frames provided with driving-wheels, driving mechanism, saddles and handle-bars and pivotally connected at one end only to extensions from the main or backbone frame, substantially as and for the purposes set forth.

3. A pacing-machine composed of five or more frames articulatively connected one with another, each mounted upon a single wheel provided with independent driving mechanism, and each frame provided with a saddle and handle-bar, two or more of said frames and wheels being lateral to the main or backbone frames and constituting equilibrium supports for the machine, substantially as described.

4. A pacing-cycle composed of a central backbone-frame provided with independent driving-wheels and driving mechanism, saddles, handle-bars and steering mechanism, one or more frames each side of the central backbone-frame and parallel thereto and connected therewith, said lateral frames provided with independent driving-wheels, saddles and handle-bars and constituting equilibrium supports for the central backbone-frame, substantially as described.

5. In combination with a central backbone-frame, mounted upon a series of independent driving-wheels and provided with a series of saddles and handle-bars, rigid tubes J, extended laterally from the backbone-frame and carrying at their outer ends vibrating frames mounted upon independent driving-wheels and provided each with a saddle and handle-bars, brace-tubes Q, connecting the outer ends of the tube J with the upper horizontal tube of the backbone-frame, substantially as hereinbefore set forth.

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

JAMES C. ANDERSON.

Witnesses:
JENNIE G. BOOTH,
DANL. W. BONN.