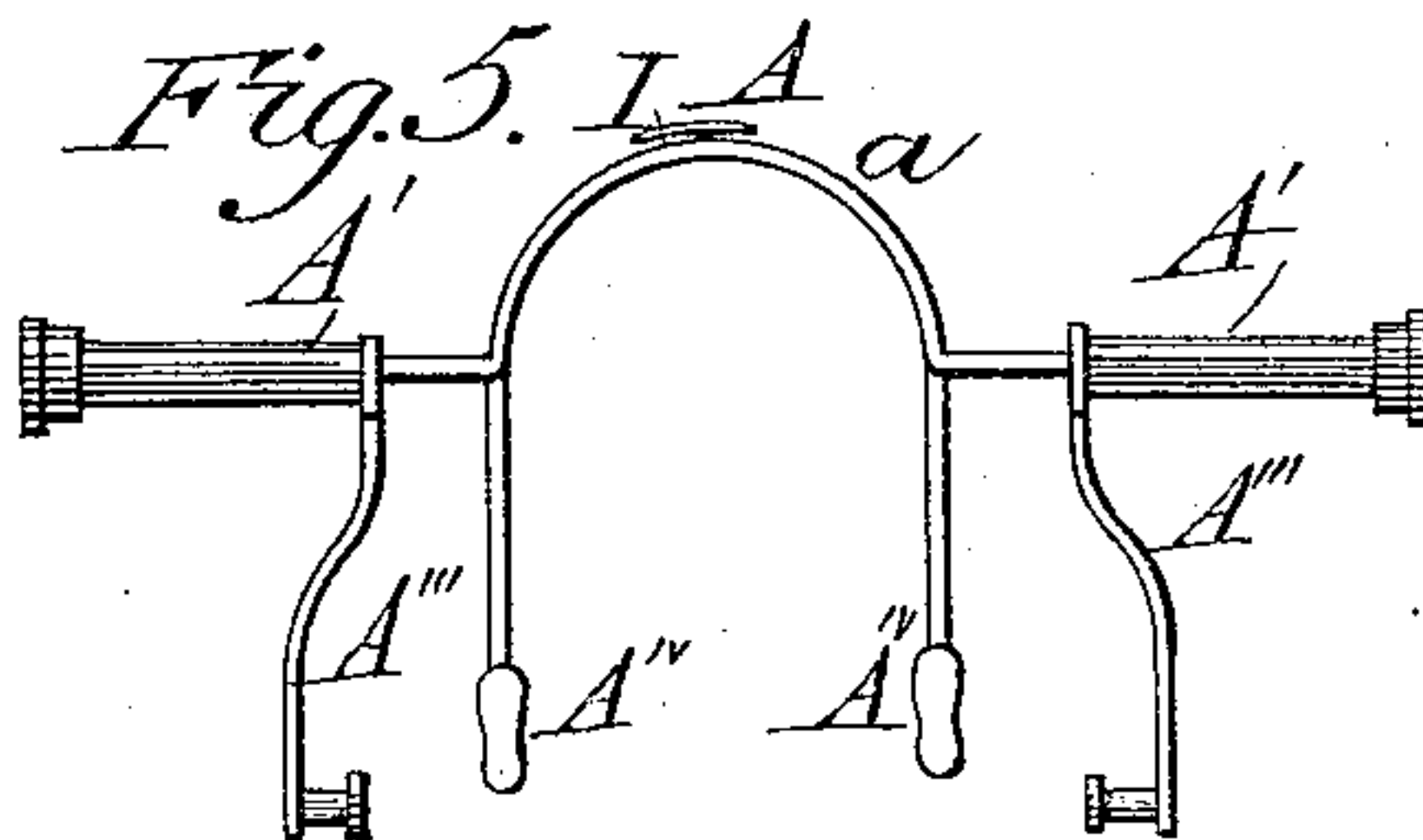
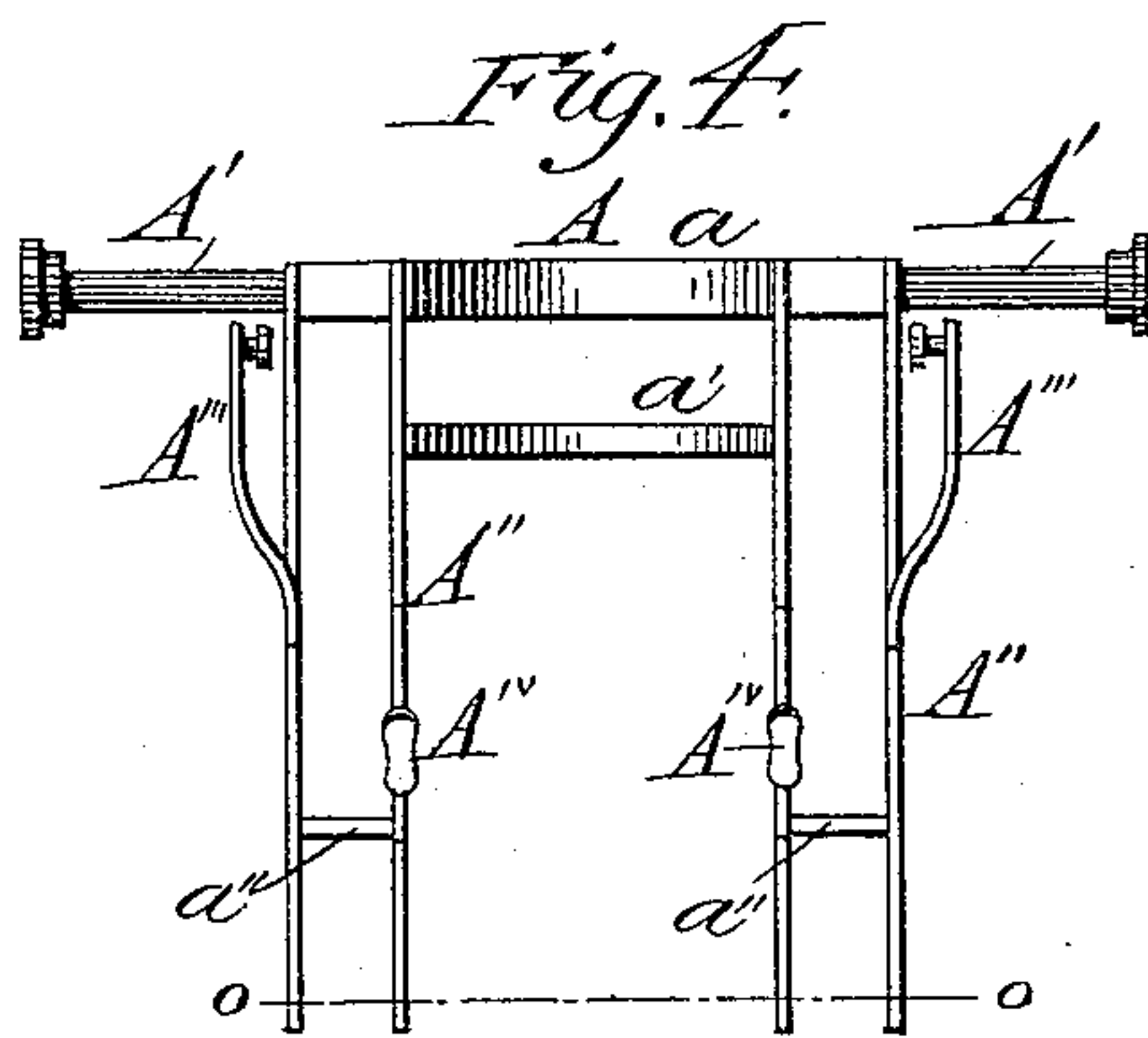
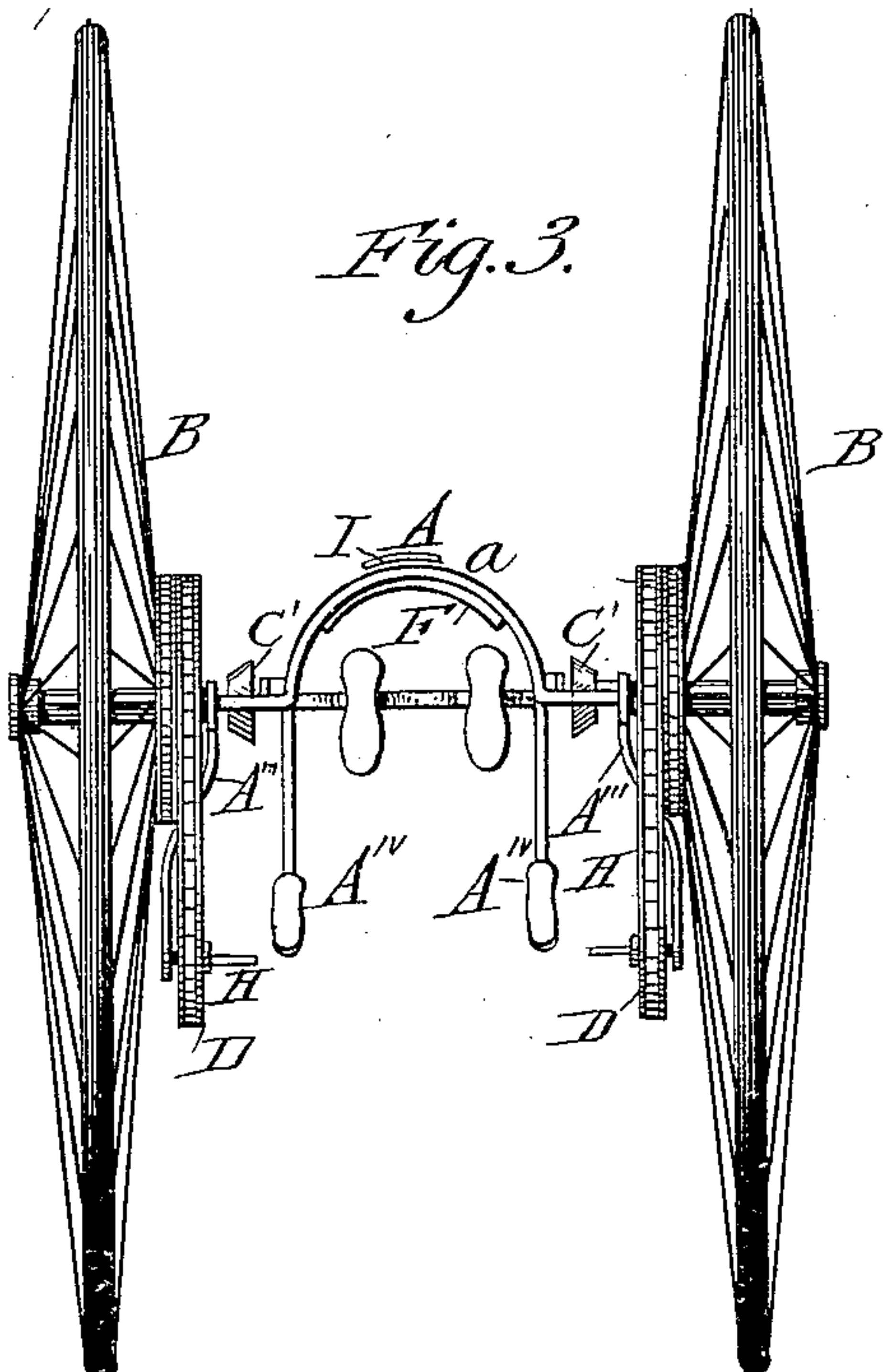
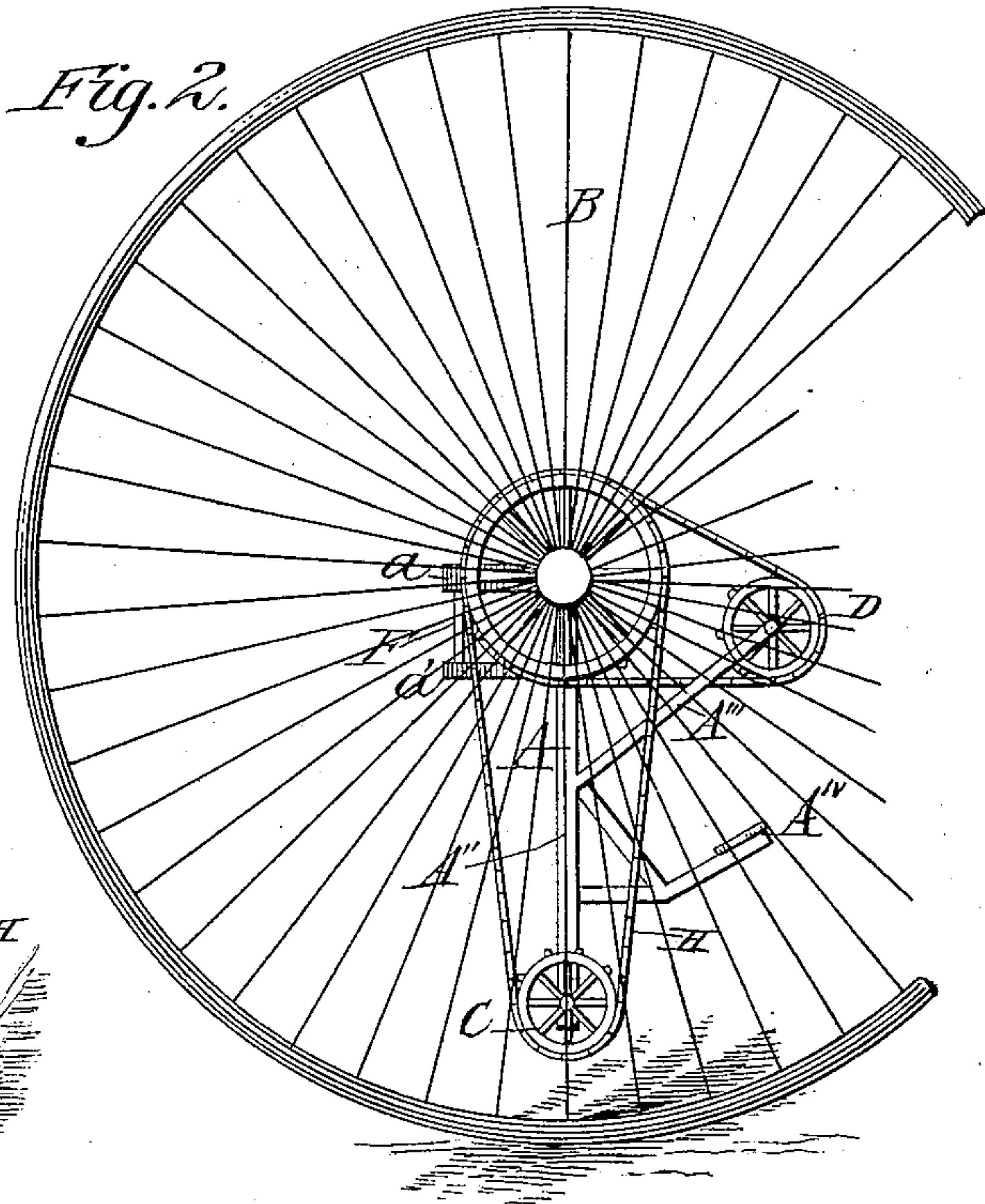
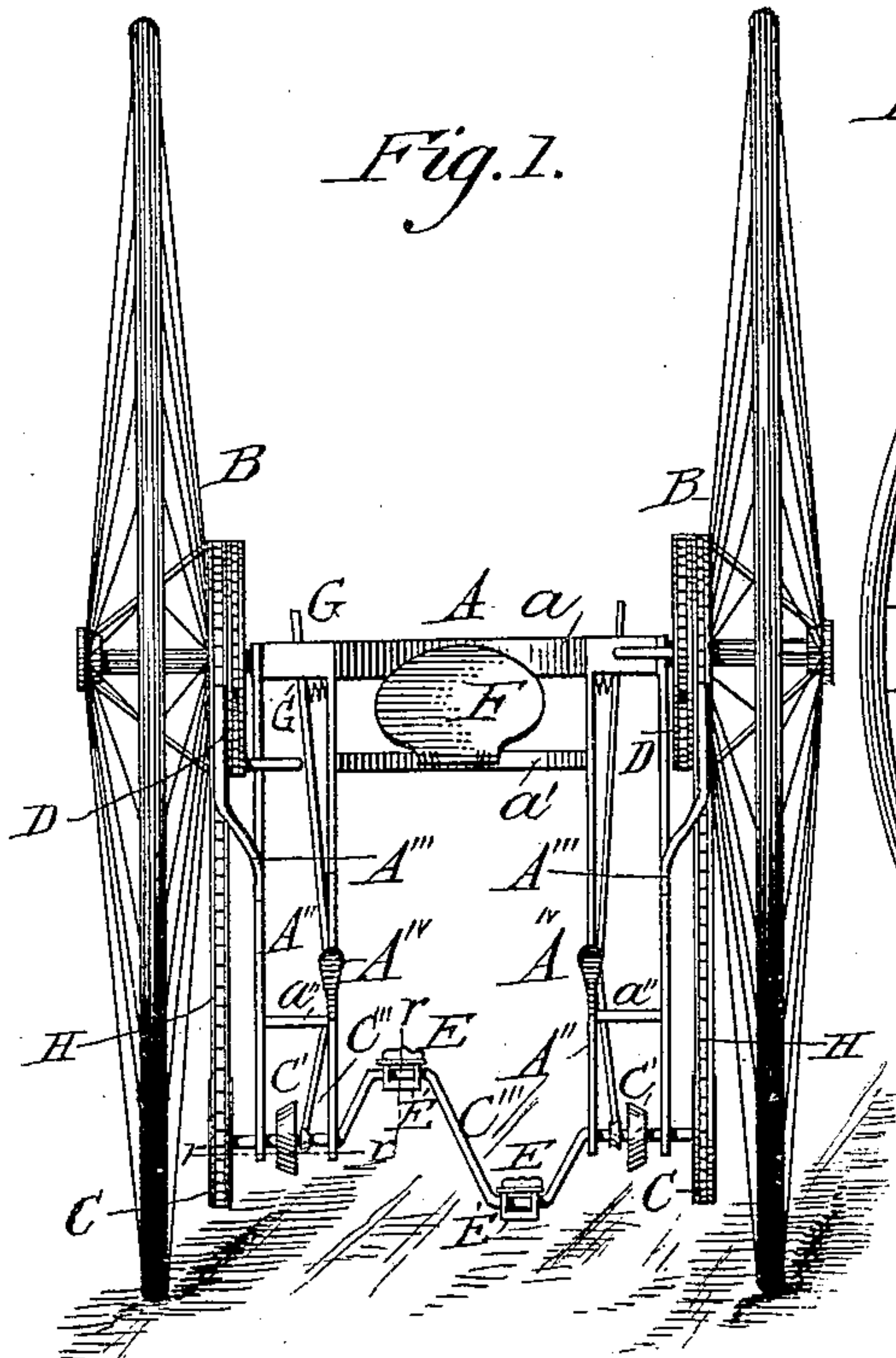


2 Sheets—Sheet 1.

VELOCIPÈDE.

Patented Sept. 18, 1888.



Robert J. Rombauer Inventor.

*Witnesses.*

W. W. W. W.  
Julius T. Bombauer

Ernst E. Rombauer

(No Model.)

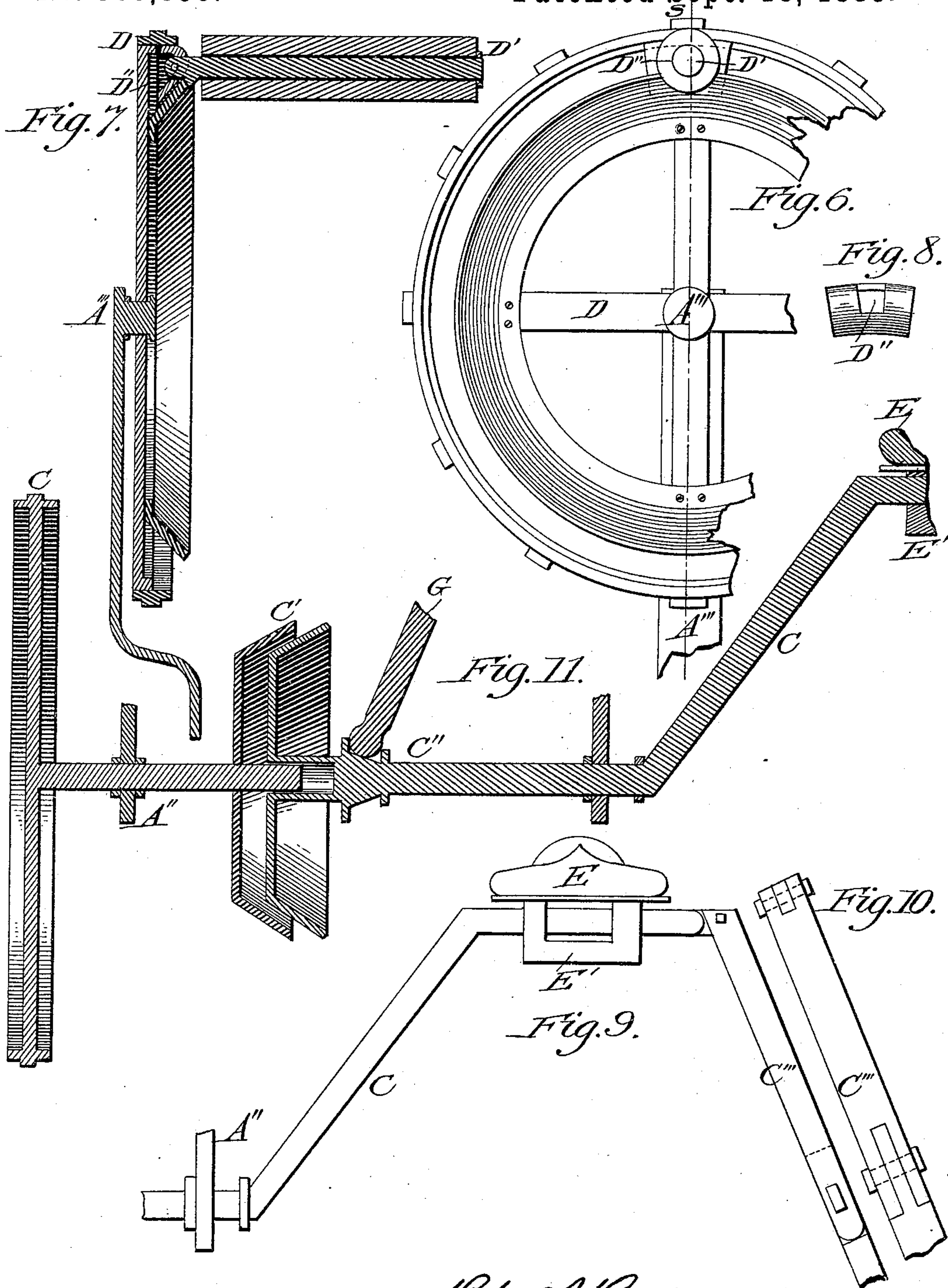
2 Sheets—Sheet 2.

R. J. ROMBAUER.

VELOCIPÈDE.

No. 389,855.

Patented Sept. 18, 1888.



Witnesses.  
Julius P. Rombauer  
Ernest C. Rombauer

Robert J. Rombauer Inventor.



# UNITED STATES PATENT OFFICE.

ROBERT J. ROMBAUER, OF ST. LOUIS, MISSOURI, ASSIGNOR OF NINETY-NINE ONE-HUNDREDTHS TO JULIUS TH. ROMBAUER, ERNEST E. ROMBAUER, AND BERTHA ROMBAUER, OF SAME PLACE.

## VELOCIPEDÉ.

SPECIFICATION forming part of Letters Patent No. 389,855, dated September 18, 1888.

Application filed November 27, 1886. Serial No. 230,087. (No model.)

*To all whom it may concern:*

Be it known that I, ROBERT J. ROMBAUER, of St. Louis, Missouri, have made a new and useful Improvement in Velocipedes, of which the following is a full, clear, and exact description.

My improved velocipede has but two wheels—namely, a pair of wheels journaled side by side upon an axle, which also, and between the wheels, carries a frame-work and mechanism for supporting the rider and for propelling the vehicle.

The leading feature of the improvement is the means by which the rider can stand erect in the line of, or substantially in the line of, but with his center of gravity below, the wheel-centers, and, with his feet upon treadles, and with a movement similar to that of walking, and with his hands applied, if desired, to auxiliary mechanism, be enabled to utilize his full weight in propelling the velocipede.

The improvement is carried out in the most desirable manner by means of the construction shown in the annexed drawings, making part of this specification, in which—

Figure 1 is a front elevation of the velocipede, the seat-board being upturned. Fig. 2 is a side elevation. Fig. 3 is a plan. Fig. 4 is a front elevation of the axle and the fixed portion of the frame-work. Fig. 5 is a plan of the axle and fixed portion of the frame. Fig. 6 is a side elevation, from the inner side thereof, of one of the hand-wheels. Fig. 7 is a section on the line *s s* of Fig. 6. Fig. 8 is a detail, being a front view of the part which is adapted to slide in the groove in the hand-wheel, and used in clamping the handle to the hand-wheel. Fig. 9 is a view of the central portion of the treadle-shaft. Fig. 10 is a side view of the link for uniting the two parts of the treadle-shaft between the treadles, and Fig. 11 is a sectional view of the treadle-shaft and parts thereto attached.

The same letters of reference denote the same parts.

The machine consists of the following parts:

*A A* represent a solid frame, comprising axle-band with axles, seat-band, vertical rods, side

bands, foot-braces, and diagonal supports for hand-pulleys.

*A' A'* are the axles for the reception of the wheels, which move freely round the axles and are kept in place by axle-screws. The axle-band *a* and seat-band *a'* of the frame form in their middle portion a semicircle to give room for the body of the rider, whether standing or sitting. *a''* are side braces for frames.

*A'' A''* are vertical rods of the frame, of which the two middle ones support the seat-board and foot-rest braces, the outside ones the hand-pulley braces. All four vertical rods have on line *O O*, Fig. 4, axle-holes for the reception of the foot-crank axles with pulleys.

*A''' A'''* are braces with axle for the reception of the hand-pulley, bent out of the way of the link-belts and strengthened by trusses from the vertical rods. (Enlarged in Fig. 7.)

*A<sup>IV</sup> A<sup>IV</sup>* are foot-rest braces of the frame, attached to vertical rods, and form rests for feet when the operator sits down and does not wish to use his feet.

*B B* are wheels with pulleys on inside hubs, with double track for link belts of foot and hand pulleys, by which the wheels are freely turned around the axles of the frame, bearing on these axles at two places—once near their outside ends, and also near the axle-shoulder of the frame.

*C C* are foot-pulleys with crank-axle turning freely in axle-holes of the vertical rods of the frame. (Enlarged in Fig. 11.)

*C' C'* are friction pulleys or clutches, by which foot-cranks can be connected or disconnected with foot-pulleys. (Enlarged, Fig. 11.)

*C'' C''* are levers arranged for above purpose with oblique circular base on foot-pulley axle to guard against upward pressure of foot-pulley axle caused by weight on treadle. (Enlarged, Fig. 11.)

*C'''* is the central connecting-link of foot-cranks with knuckle-joint in center, admitting lateral motion caused by the connection or disconnection of the friction pulleys or clutches. This link does not bend in the direction of the forward or backward motion of the machine. (Enlarged, Figs. 9 and 10.)



D D are hand-pulleys with track for link belt on tire and circular groove near periphery. (Enlarged, Figs. 6 and 7.)

D' is a handle secured in groove, freely turning on its core and movable on a pivot. (Enlarged, Figs. 6 and 7.)

D'' is a slip and clamp-piece between flanges, which permits the handle to deflect sufficiently outward from right angle at center, that it may be shifted to place most comfortable for use, and clamped there by being brought to position at right angles with radius. (Enlarged, Figs. 6, 7, and 8.)

E E are slippers freely movable round foot-crank rod, but evenly balanced as to heel and toe portions. (Enlarged, Figs. 9 and 11.)

E' E' are bars movable with the slippers on same pivot, but whose weight will keep slippers always in horizontal position for convenient use. (Enlarged, Figs. 9 and 11.)

F is the seat, which can be raised or let down on spring-hinge, to be raised when operator desires to use hand and feet, and stands in a vertical position between the axles, and to be lowered when operator wants to sit down and not use the feet.

G G are levers for connecting or disconnecting friction pulleys or clutches, having notches provided in rear of axle-band, by which the lever can be kept steady in any desired position.

G' G' are springs which hold lever in a position to keep friction pulleys or clutches connected unless displaced by handling.

H H are link belts as communicators of power.

I I are bolts on the middle of axle and seat-band to admit separation of machine in halves for the purpose of storing, in which case one of the pins on the central connecting-link of the foot-cranks (C'') has to be drawn.

The dimensions may be changed in proportion or also changed in the relation of the parts to each other as more speed or more power is desired. Likewise may the height of the wheels be reduced if the lower portion of the frame is loaded with freight or ballast. A vigorous active man can operate the clutches or friction-pulleys, if they are well made, without the assistance of the lever G. The open spaces on hub may be lightly covered to protect axles from dirt.

*Frame.*—The machine consists of a frame, A A, of which Fig. 4 is the front view and Fig. 5 the top view, and which furnishes axles to the large wheels. At axles for the hand-pulleys and at the bottom of the vertical rods are axle-holes for the foot-pulley axle. The upper and lower horizontal bands of the frame curve out in their central portion, so as to admit the body in the vertical plane of the axles. Four vertical rods reach down from the upper horizontal band or axle-band. The middle two of these rods support the seat-band and the foot-rests. From the outer two vertical rods of the frame stretch forward diagonal

braces, which have a reverse curve, bent in order to give room for the hand-pulley disk and to bring the same into the same plane with the hand-pulley belt-track on the hub. The diagonal braces and truss-bands have on their apex the axles around which the hand pulley disks turn.

The large wheels B B have on the inside periphery of their hubs link-belt tracks, upon which the link belts of the hand and foot pulleys act, causing the motion of the machine. The hand and foot pulley link-belt tracks are respectively in the same vertical plane with the link-belt tracks on the hubs of the large wheels.

The hand-pulleys D D have an arrangement near the periphery of their disks by which the crank-handles can be shifted to any position of their circle. The hand attachment to the pulley D (illustrated by Fig. 7) consists of a handle, which turns round its core. This core has a hinge, which connects it loosely with a bent piece of sheet-iron in such manner that when the handle is brought into a position at right angles to the plane of the hand-pulley disk it presses the sheet-iron piece against the inner walls of the groove on the hand-pulley near its periphery, acting as a clamp, which fastens the handle to the hand-pulley in any position that may be desired. The object of this arrangement is to give the operator the chance of bringing his hands with the hand pulley handles into any position which the position and movement of the feet may conveniently demand. This is desirable, for the feet remain in the same relative position to each other, because even on turns, where one wheel is moved slower than the other, the feet move evenly on the treadles, the slower motion being effected by the disconnection of the gear on the foot-pulley axles. The hand-pulley is turned on by the link belt, and as soon as one wheel is turned slower than the other the handles, if made entirely fast to the hand-pulley, would often come into positions which would not be most convenient to the operator. In order to attain the object aimed at—namely, to imitate as near as possible the action of the body while walking—some arrangement is necessary by which the handles can be brought into the desired position.

The purpose of the various parts and of the whole machine is to furnish a velocipede which can be propelled by the full weight and force of the human body safely without balancing into any direction.

The large wheels turn on the axles of the frame, which is kept in vertical position by its own weight and the weight of the operator, the center of gravity of both being below the axles. The wheels are propelled by link belts passing round their hubs and moved by foot and hand pulleys. The foot-pulleys are driven by the uniform movement of the feet on treadles, which can be disconnected from the



gear in order to secure the same relative position of the feet, even when, for the purpose of turning, one of the large wheels is stopped or moved slower than the other. Friction-pulleys C' C', moved by a lever, G G, serve the purpose of this connection or disconnection. The hand-pulleys also propel the large wheels by link belts, and as they move continuously with the large wheels, having no disconnecting arrangement on the axles, their convenient use after turns is secured by the shifting of the handle. Either hand or feet can be used separately or jointly. When the operator sits, he can use the hands only. When he is erect, he may use hand and feet, or either separately.

I am aware that previous to my invention various machines have been made for the locomotion of man by his own power. I therefore do not claim such a combination, broadly; but What I do claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of the wheels, the axle extending from wheel to wheel and made with an offset, as described, the hand-wheels, as described, and the treadle-shaft continuous from clutch to clutch and journaled in bearings suspended from said axle in the vertical plane of the centers of said wheels and at the level described, to enable the rider to stand erect in the line of, but with his center of gravity below, said wheel-centers, and, with his feet upon the treadles, and with a walking movement and rotating the hand-wheels, to propel the velocipede, substantially as described.

2. The combination, in a velocipede, of the treadle-shaft jointed at its middle, as described, the lower pulley-shaft, the clutches, and the levers for shifting the treadle-shaft, as and for the purpose described.

3. The arrangement of the foot-pulleys C with friction-pulleys C', lever (arrangement) C'', for the purpose of connecting or discon-

necting power with motion, of connecting-link C''' between foot-crank treadles, which admits of disconnection at friction-pulleys without disconnecting the two treadles and of a uniform application of the action of both feet on both wheels of the machine, of slippers E and bar for slippers E', holding them in position, of lever G and lever springs G', and of link belts H, and of all parts designated for the free and full use of the foot-pulley gear.

4. The arrangement of hand-pulleys D, transmitting power by link or other belts H, of groove on hand-pulley disk, of handle D', and slip clamp-piece D'', for shifting of handle to convenient position with all its parts.

5. The arrangement and combination of foot-pulleys C, hand-pulleys D, slipper E, seat F, lever G, link belts H, and bolts I, by which the machine, suspended on the axles, necessitating no balancing, can be freely moved in any direction by hand or feet while the operator is standing or sitting, and can be separated for more convenient storing.

6. The arrangement and combination in this machine of frame A, wheels B, foot-pulleys C, hand-pulleys D, slippers E, seat F, lever G, link belts H, and bolts I, by which it may be propelled by the weight and muscular power of the human body, either while sitting or in an upright position, with a motion similar to walking, without the necessity of balancing, moving, or turning in any direction, with a uniform application of the full weight of the body on both wheels at the same time, and adjustable for the most convenient use and storing of the same, the machine to be constructed and used in the manner described and specified.

ROBERT J. ROMBAUER.

Witnesses:

JULIUS T. ROMBAUER,  
ERNST E. ROMBAUER.