

No. 616,067.

Patented Dec. 20, 1898.

A. BAILEY.
CHAINLESS BICYCLE.

(Application filed Nov. 13, 1897.)

(No Model.)

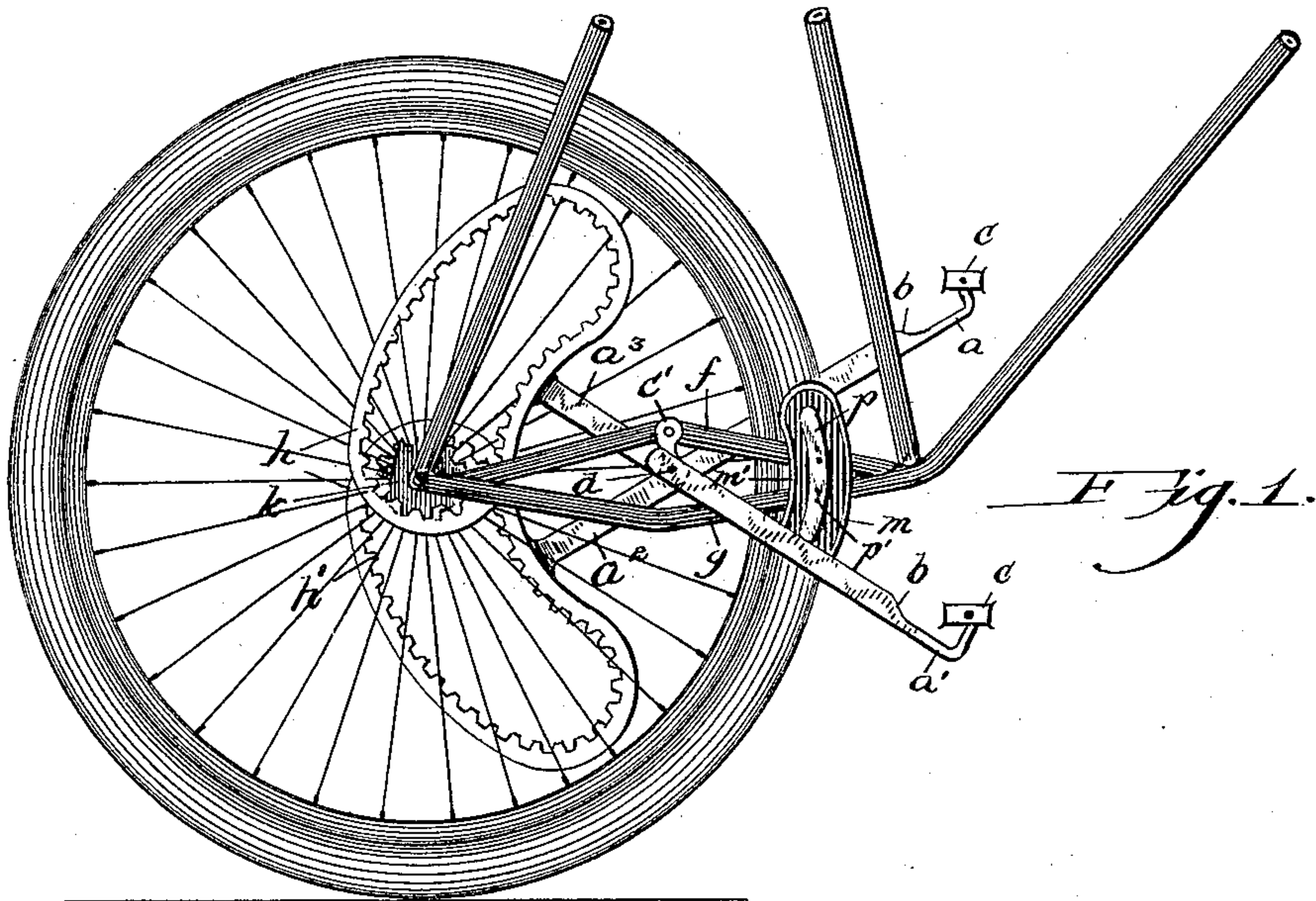


Fig. 1.

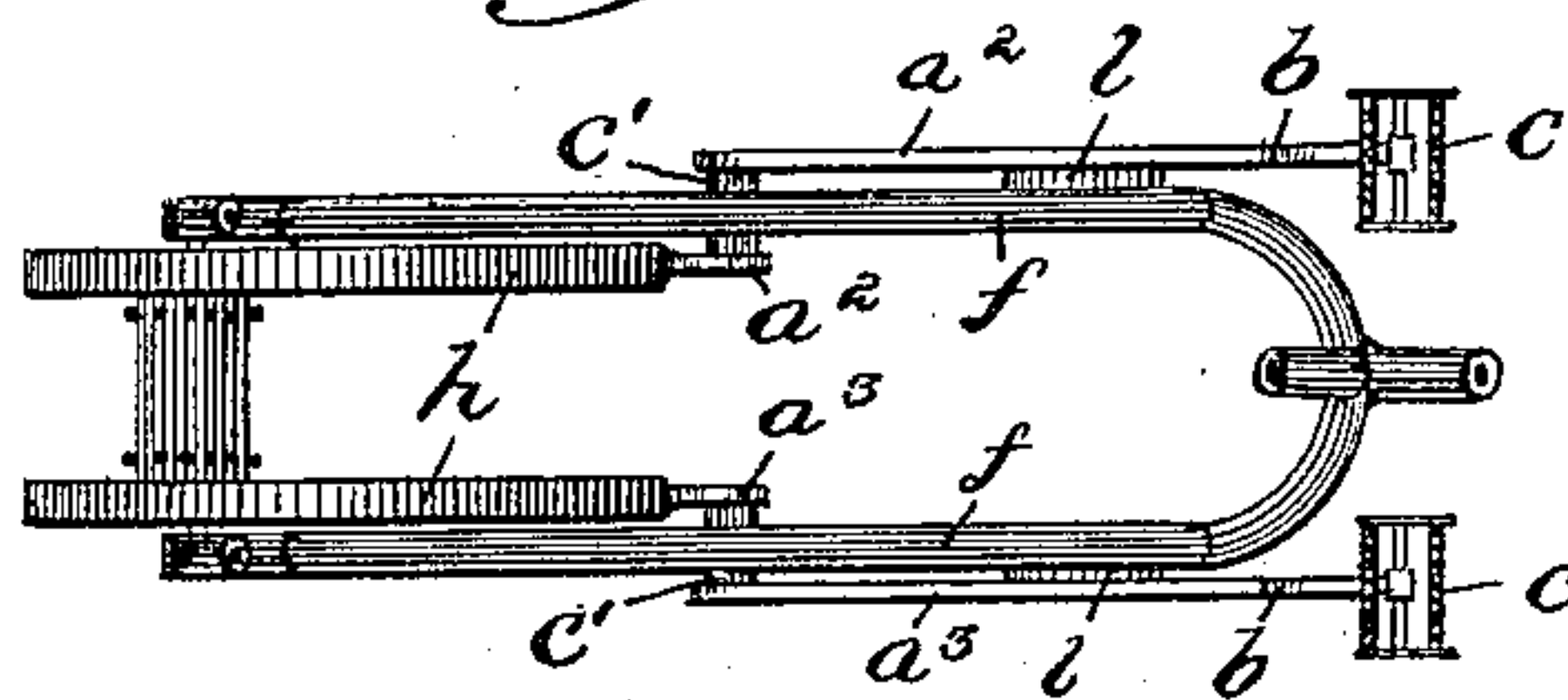


Fig. 2.

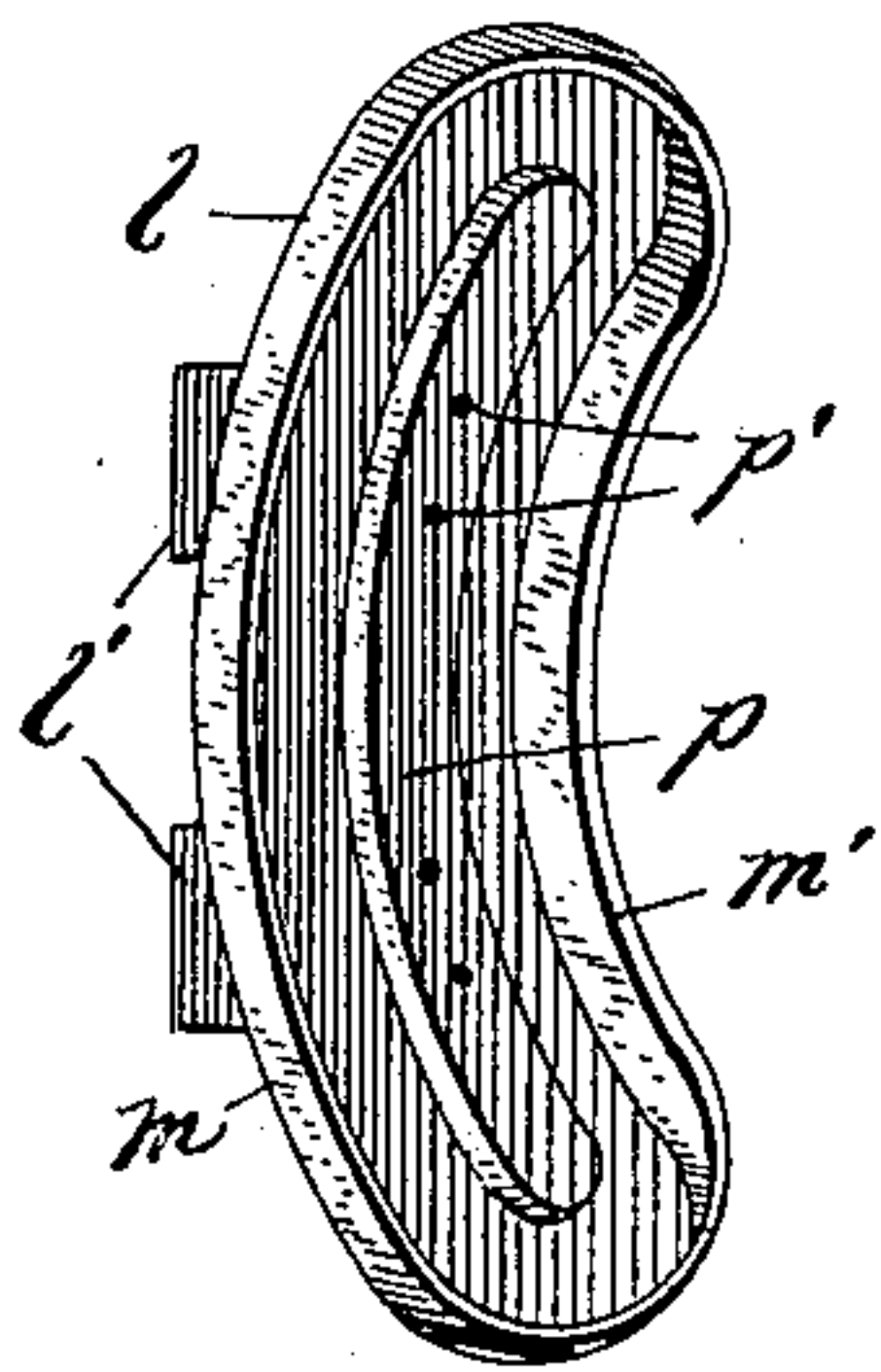


Fig. 3.

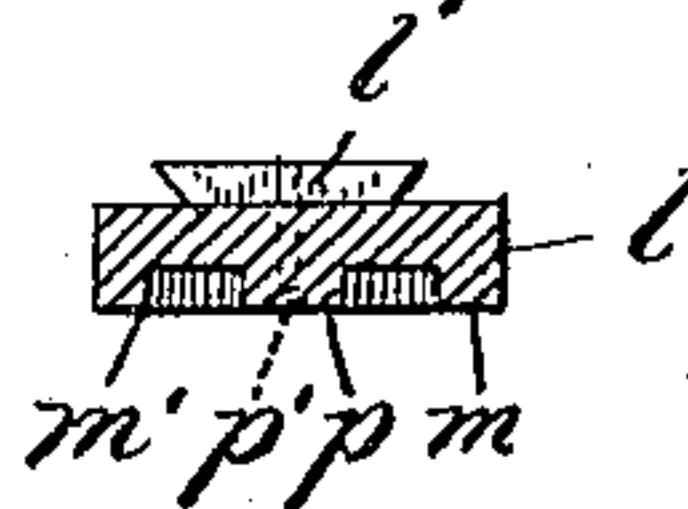


Fig. 4.

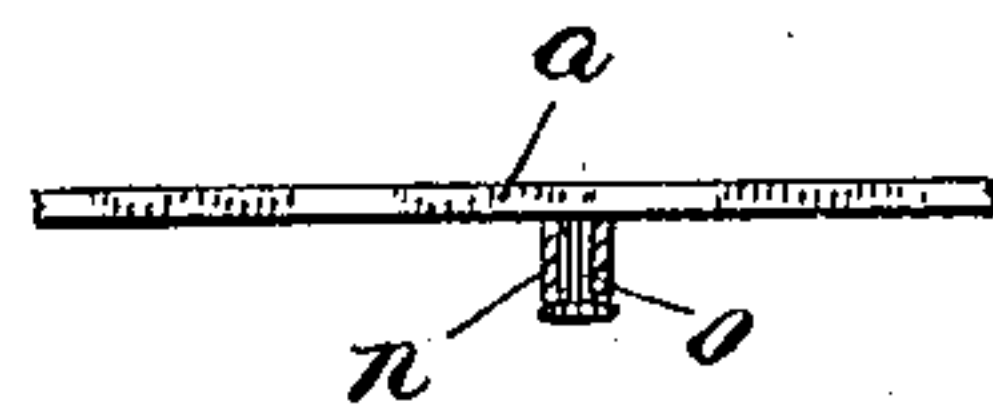
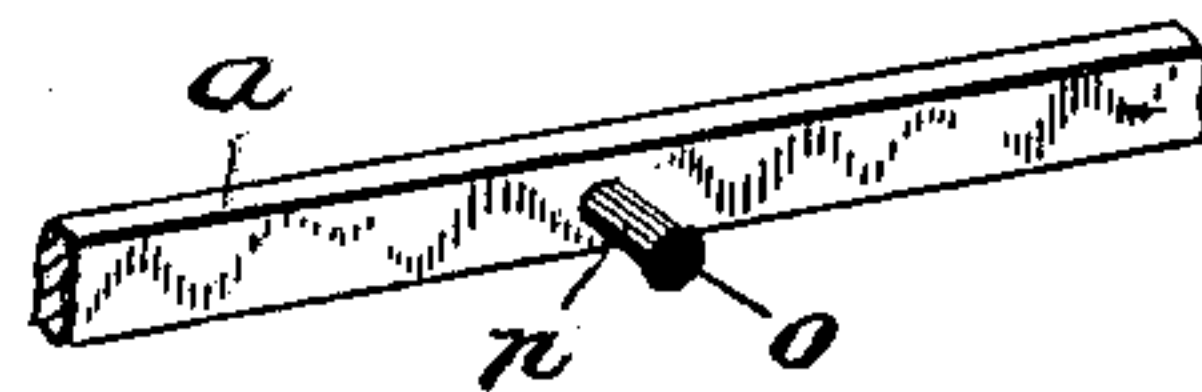


Fig. 5.



WITNESSES:

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CHAINLESS BICYCLE.

SPECIFICATION forming part of Letters Patent No. 616,067, dated December 20, 1898.

Application filed November 13, 1897. Serial No. 658,483. (No model.)

To all whom it may concern:

Be it known that I, ARCHIBLE BAILEY, a citizen of the United States of America, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Chainless Bicycles, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to certain new and useful improvements in velocipedes, and more particularly to that class thereof known as "bicycles."

The invention has for its object to provide 15 novel and effective means for the propulsion of a bicycle without the aid of the ordinary chain and large sprocket-wheel.

The principal features of my invention consist in two pedal-levers, one at each side of the machine and upon the free end of which are mounted the pedals, while the other end carries segmental racks, which engage and operate upon the sprocket-wheels that are mounted on the axle of the rear or driving 20 wheel of the machine. These pedal-levers are each formed in two pieces and connected to a common pin or shaft that is carried by the rocker-arm suspended from the rear forks of the bicycle. The portions of the pedal-levers to which the pedals are attached are further supported by means of a pin secured therein that operates in a segmental groove provided therefor in the guide-plate that is attached to the rear forks of the frame.

35 The invention resides also in the novel construction of these rear forks, whereby the guide-plate may be firmly attached to the same, and also providing a means for suspending the rocker-arm therefrom as well as permitting the operation of the rear or that portion of the pedal-levers carrying a segmental rack inside of the frame and the operation of the pedal-lever proper outside of the frame, all of which construction will be hereinafter more 40 fully described, and particularly pointed out in the claim.

In describing the invention in detail reference is had to the accompanying drawings, forming a part of this specification, and wherein like letters of reference indicate similar parts throughout the several views, in which—

Figure 1 is a side view of a portion of a bicycle, showing my improved propelling means applied thereto. Fig. 2 is a plan view of a portion of the frame, showing the propelling 55 means in position. Fig. 3 is a perspective view of the guide-plate that is attached to the rear forks of the frame. Fig. 4 is a horizontal sectional view of the same. Fig. 5 is a top view of a portion of the pedal-lever, showing the collar mounted on the engaging-pin 60 in section. Fig. 6 is a perspective view of a portion of one of the pedal-levers.

Referring now to the drawings by reference-letters, a a' represent the pedal-levers proper, 65 which are formed near their outer or free end with a depression or cut-away portion b , thus forming a receptacle for the heel and rear portion of the rider's foot. The ends of said levers are turned upwardly to a vertical 70 position and have mounted therein the pedals c . These levers at their rear end are connected to a pin or short shaft d , that is supported by a rocker-arm e' , pivotally hung from the upper bars on the rear forks. These 75 forks are preferably constructed of two pieces of tubing f and g , brazed together at the ends and converging outward at the center, thus forming a diamond-shaped brace on each side of the machine to compose the rear forks. 80 Attached to the other end of said pin or short shaft are the rear sections a^2 a^3 of the pedal-levers, which has formed integral therewith or otherwise rigidly connected thereto a segmental rack h , the teeth h' of which are arranged on the inner periphery of the segment and are adapted to engage with the sprockets k , secured to the axle of the rear or driving wheel. The pedal-levers a a' are further guided in their movement by means 90 of a segmental-shaped guide-plate l , formed on its rear face with a dovetailed key or wedge l' , that fits into a groove provided therefor in the two braces f and g , composing the rear forks. These guide-plates are also 95 preferably riveted tightly to the braces after having been placed in position. On their outer faces these plates are formed with a segmental groove which, for the purpose of more clearly defining the operation, has that part 100 thereof toward the front of the machine designated m and that portion toward the rear

of the machine designated m' . This groove is adapted to receive the sleeve n , which is mounted on the pin o , that is rigidly affixed in each of the pedal-levers a a' , the said sleeves riding against the edges of the raised segment p , formed on the outer face of the guide-plate by constructing the groove. This raised segment portion of the guide-plate also provides means for riveting the plate firmly to the braces f and g , as is shown by the location of the apertures p' in Fig. 3 of the drawings. The pedal-levers a a' are adapted to have an alternate movement, the one on the one side of the machine being at the extreme lowest point of the stroke when the one on the opposite side of the machine is at the extreme height of the stroke. Thus when the lever a is depressed at its outer or pedal extremity the segment-rack that is carried thereby will be at the highest point of its travel when the upper end of the lever reaches the lowest point of its stroke, and the lever a' will have its pedal extremity at the highest point and the rack carried by that portion a^3 of the lever a' will be at the lowest point of its stroke.

As the sleeve n , which is affixed on the pin o , carried by the lever a , travels downward in the groove m until it reaches the lowest point the segment-rack of the said pedal-lever, having reached its extreme limit of travel, is drawn slightly rearward as the sprockets continue to travel in the teeth of the rack, thus bringing the sleeve n into the groove m' for the ascending movement of the aforesaid lever a . This movement is the same for the lever a' , and it will be seen that during the movement of the levers and of the operation of the segment-racks over the sprocket-wheels the rocker-arms are moved but a slight distance in order to permit the heretofore-described movement of the levers a and a' . These rocker-arms being pivotally suspended from the upper brace of the diamond-shaped forks reduce the friction to a much greater extent than would be obtained were the forks of the machine composed of a single brace on each side, which

would compel the supporting of the rocker-arms from this brace in a manner that would cause the weight and pressure of the lever to be brought directly upon the same. It is mainly for this purpose that the diamond-shaped braces are provided for the rear forks, and they further serve as a means for attaching the guide-plates l more rigidly to the forks.

It will be observed that by constructing the pedal-levers in two sections and connecting the same to a common pin or shaft the levers proper may thus be arranged on the outside of the frame and the gearing on the inside of the frame, so as to fully protect the same. The same driving means may, however, be applied to the ordinary bicycle-frame, which is not provided with the diamond-shaped forks.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

In a propelling mechanism for bicycles, the combination with the frame, pedal-levers, said pedal-levers being connected by a shaft d , said shaft being supported by the rocker-arm c' , a diamond-shaped brace comprising the rods f and g , said rods being brazed together at their ends, sections a^2 , a^3 attached to one end of said shaft d , segmental racks h formed integral with said sections a^2 , a^3 , teeth formed upon the inner face of said segmental racks h , pinions secured upon the rear axle or driving-wheel, guide-plates l , attached to the brace-rods, segmental grooves formed on the outer face of said plate, a pin o having a sleeve mounted thereon, said pin being rigidly secured to the pedal-levers a , a' and adapted to operate against the edge of the raised segment p , substantially as herein shown and described.

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

ARCHIBLE BAILEY.

Witnesses:

JOHN NOLAND,
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