(No Model.) 2 Sheets—Sheet 1.

F. H. PECK.

BICYCLE.

No. 523,943. Patented July 31, 1894.

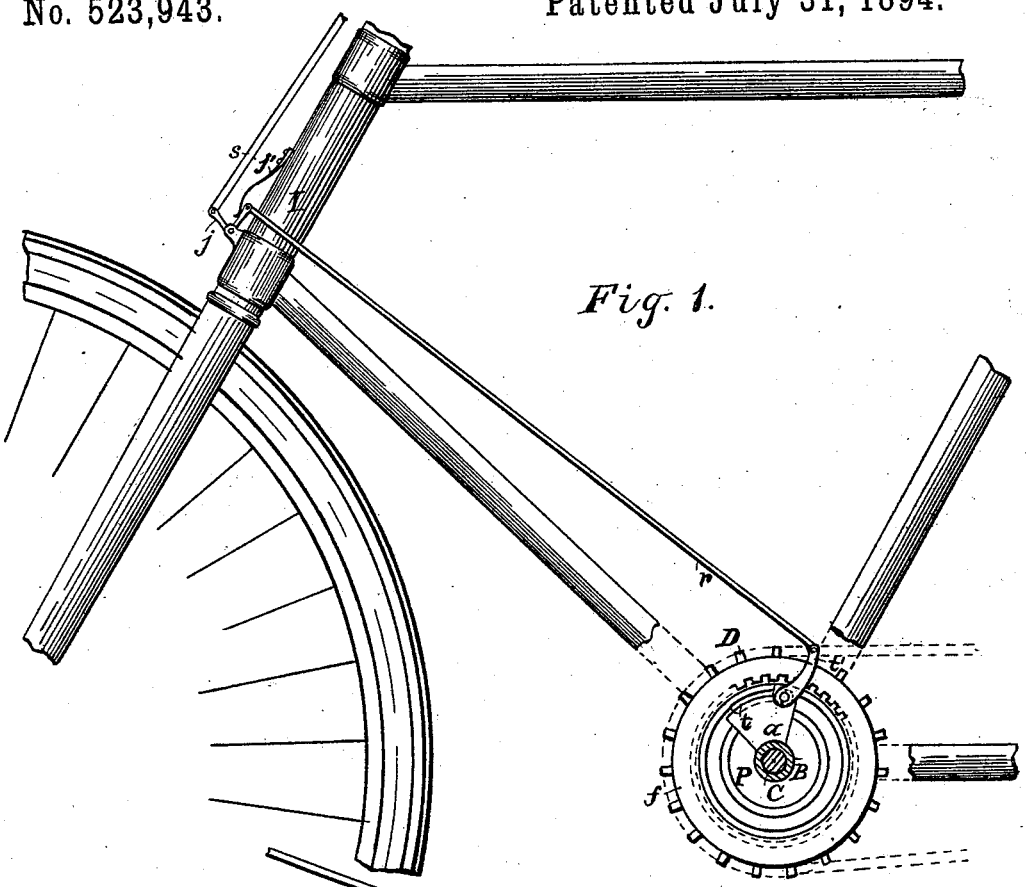

Fig. 1.

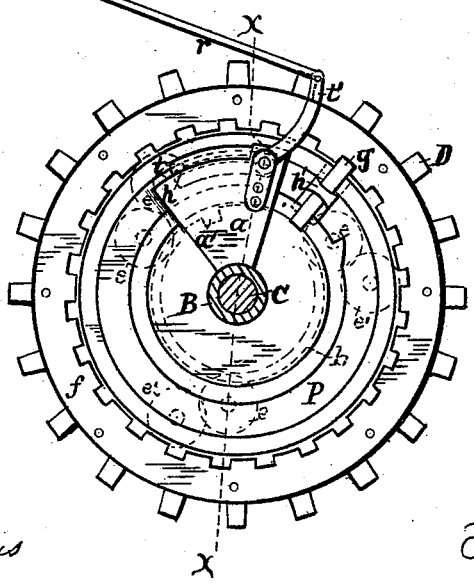

Fig. 2.

WITNESSES:
H. M. Seawans
Mark W. Dewey

INVENTOR,
Fayette H. Peck
By C. H. Duell,
his ATTORNEY.

(No Model.) 2 Sheets—Sheet 2.

F. H. PECK.

BICYCLE.

No. 523,943. Patented July 31. 1894.

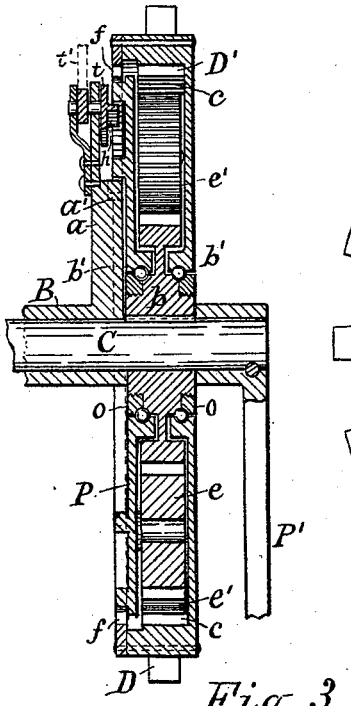

Fig. 3.

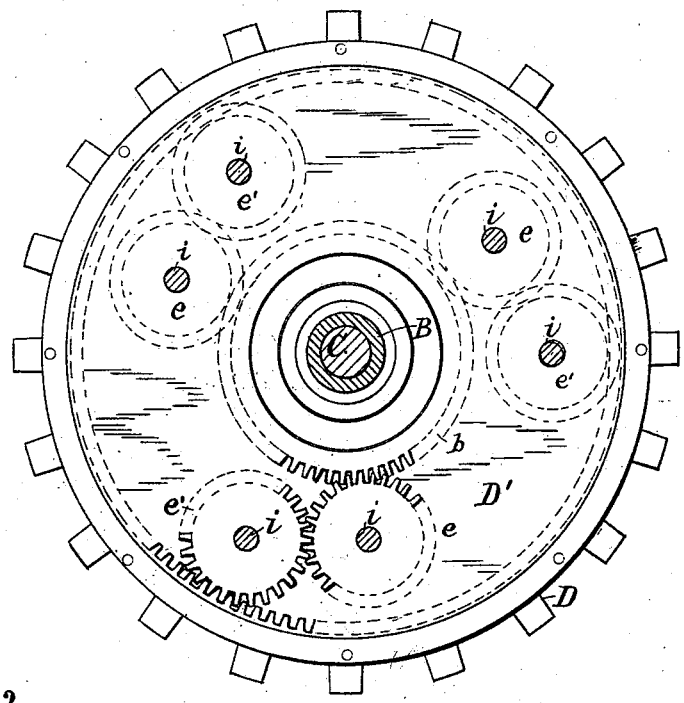

Fig. 4.

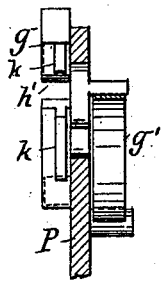

Fig. 5.

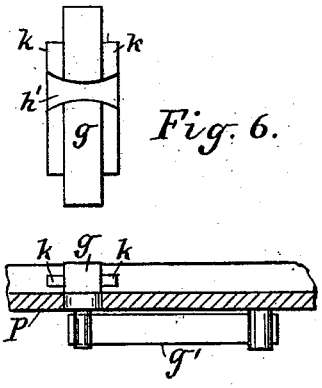

Fig. 6.

Fig. 7.

WITNESSES:

H. M. Seamans

Mark W. Dewey

INVENTOR,

Fayette H. Peck

By C. H. Duell

his ATTORNEY.

UNITED STATES PATENT OFFICE.

FAYETTE H. PECK, OF CLINTON, NEW YORK.

BICYCLE.

SPECIFICATION forming part of Letters Patent No. 523,943, dated July 31, 1894.

Application filed August 12, 1893. Serial No. 483,028. (No model.)

To all whom it may concern:

Be it known that I, FAYETTE H. PECK, of Clinton, in the county of Oneida, in the State of New York, have invented new and useful Improvements in Bicycles, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to devices for varying the transmission of power from the driving shaft to the propelling wheel so that either rapid motion may be imparted to the wheel with moderate power applied to the shaft while traveling over a smooth level road, or slow motion of the wheel with increased power to the shaft may be obtained when traveling over an ascending grade.

The object of my present invention is to accomplish the aforesaid results by more simple, stronger and positive acting means than heretofore employed.

To this end my invention consists in the combination with the driving-axle and hanger, of a pinion keyed to the axle, a loosely mounted sprocket-wheel provided with a rack, a plate movable independently of the aforesaid pinion and sprocket-wheel, two pinions pivoted to said plate, in mesh with each other and engaging the keyed pinion and rack on the sprocket-wheel, an annular internally notched ring or ratchet rigid on the sprocket-wheel, a catch-plate fixed to the said hanger, a notch in the catch plate, a bolt secured to the movable plate, and adapted to move longitudinally and radially on said plate to lock the same either to the ratchet on the sprocket-wheel or to the catch-plate, a spring to hold said bolt normally engaged with the ratchet, a lever pivoted to the catch-plate and provided with a rib to engage a groove in the side of the bolt to move the bolt out of engagement with the ratchet and into engagement with the catch-plate, and suitable means to operate the lever.

In the drawings accompanying and forming a part of this specification, Figure 1 is an inner side view of my improved devices in connection with the rod known as the brake-rod of the bicycle. Fig. 2 is an enlarged view of the same. Fig. 3 is an enlarged transverse section on line x, x, in Fig. 2. Fig. 4 is a view of the interior of the sprocket-wheel, and Figs. 5, 6 and 7 are detail views of the sliding bolt on the movable plate or disk.

Referring specifically to the drawings, B is the hanger, in which is journaled the driving-axle C, which latter has affixed to its ends the usual pedals P′. To one end of said hanger is rigidly attached the catch-plate, a, which is provided with the notch a' in its periphery. Adjacent to said catch-plate is the driving pinion, b, fastened or keyed to the axle. The hub of this pinion is sufficiently elongated to be provided with the ball bearings, b', b', at opposite sides of the web of the pinion as shown in Fig. 3 of the drawings. Upon the outer of said ball bearings is mounted the sprocket-wheel, D, which is formed with an annular cavity, D′, on its inner side and formed with the rack c on the interior of the rim of said wheel. Upon the other of the aforesaid ball-bearings is mounted the annular plate, P.

To the plate P are fastened three sets of gudgeons i, i, equal distances apart on which are mounted the intermediate pinions e, e', which mesh with each other and with the pinion b, and rack c as shown in Fig. 4 of the drawings. The said intermediate pinions may be provided with ball-bearings on the gudgeons to obviate friction, if desired.

To the inner edge of the rim of the sprocket-wheel is fastened an inwardly toothed annular ratchet plate, f, and on the plate P is mounted to move longitudinally and radially a bolt g, one end of which is adapted to engage and release the notch a', of the catch-plate a, and the opposite end is adapted to engage and release the ratchet-plate f. A spring g' on the opposite side of the plate and bearing upon a pin fixed to the bolt and extending through a slot in the plate holds said bolt normally in engagement with said ratchet-plate, and when thus engaged it is released from the notch a'.

To the catch-plate is pivoted at one end, a lever, t, having a curved rib, h, which, when in its normal position lies concentric with and between annular ribs on the plate or disk P, and in the path of a groove h' in the adjacent side of and extending across the bolt, g, which is mounted to slide radially in the said plate. An arm t' extends upward from the pivoted end of the lever, t, and is connected by a rod,

r, to one of the arms of a bell-crank lever, j, pivoted to the head I, of the frame. The other arm of the lever, j, is connected to a rod, s, which may be the brake-rod with the brake-shoe removed, moved longitudinally by a suitable lever connected to the upper end of the head, I, not necessary to be shown. A spring, j', secured to the head, I, and bearing against the bell crank lever holds the ribbed lever in its normal position so that the rib will pass freely through the groove in the bolt when the plate P is rotated at each revolution without friction. Ribs, k, k, on each side of the bolt, g, slide in grooves in the ends of the annular ribs between which the bolt slides.

All of the ball-bearings of the sprocket-wheel D and plate P are protected from dust by disks, o, o, of felt or other suitable material secured to the outer sides of the said wheel and plate.

The operation of the described differentiating power-transmitter is as follows: The bolt, g, being held normally engaged with the ratchet-plate, f, locks the plate, P, on the ratchet-wheel, hence the power is transmitted from the driving pinion, b, directly to the sprocket-wheel and compels the same to revolve in unison with the said pinion. The sprocket-wheel is thus geared for high speed and in this condition the power-transmitter is maintained while the bicycle is propelled over a smooth level road. When ascending a grade, the rider of the bicycle applies pressure on the rod, s, and this turns by means of the lever, j, and rod, r, the ribbed lever, t, so as to throw the rib, h, in the path of the inner side of the groove in the bolt, g, which is thereby drawn out of engagement with the ratchet-plate, f, and made to engage the notch, a', of the catch-plate a. This locks the plate, P, to the plate, a, and therefore holds said plate stationary. As soon as this is effected the intermediate pinions, e, e', are caused to transmit the power from the driving pinion, b, to the rack, c, which is integral with the sprocket-wheel. The speed of the latter is thus reduced and the power is greatly increased in its transmission.

When it is desired to change the gears for high-speed the rider reverses his operation on the rod, s, and thereby turns the ribbed lever, t, back so as to release the bolt and allow the spring, g', to throw the bolt out of the notch, a', and allow said bolt to spring into engagement with the ratchet-plate f.

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

1. The combination with the driving axle, hanger and catch-plate, of a pinion keyed to the driving axle, a loosely mounted sprocket wheel provided with a rack, a plate movable independently of the aforesaid pinion and sprocket-wheel, two pinions pivoted to said plate and engaging the keyed pinion and rack on the sprocket-wheel, a bolt secured to the movable plate, and movable longitudinally and radially on said plate to lock the same either to the sprocket-wheel or to the catch-plate, a groove in the side of the bolt, and a lever pivoted to the catch plate and adapted to engage the bolt in said groove to move the same, substantially as described and shown.

2. The combination with the driving-axle and hanger, of a pinion keyed to the axle, a loosely mounted sprocket-wheel provided with a rack, a plate movable independently of the aforesaid pinion and sprocket-wheel, two pinions pivoted to said plate, in mesh with each other and engaging the keyed pinion and rack on the sprocket-wheel, an annular internally notched ring or ratchet rigid on the sprocket-wheel, a catch-plate fixed to the said hanger, a notch in the catchplate, a bolt secured to the movable plate, and adapted to move longitudinally and radially on said plate to lock the same either to the ratchet on the sprocket-wheel or to the catch-plate, a spring to hold said bolt normally engaged with the ratchet, a lever pivoted to the catch-plate and provided with a rib to engage a groove in the side of the bolt to move the bolt out of engagement with the ratchet and into engagement with the catch-plate, and suitable means to operate the lever, substantially as described.

In testimony whereof I have hereunto signed my name.

FAYETTE H. PECK. [L. S.]

Witnesses:
NATHAN L. HAYES,
DELOS DE WOLF SMYTH.