(No Model.)

G. A. GRAVES.

BICYCLE.

No. 544,165. Patented Aug. 6, 1895.

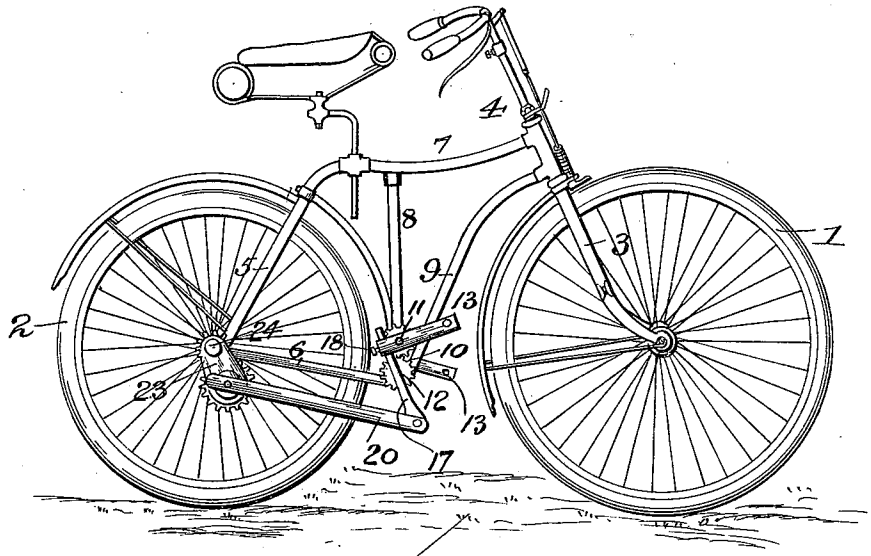


Fig. 1.

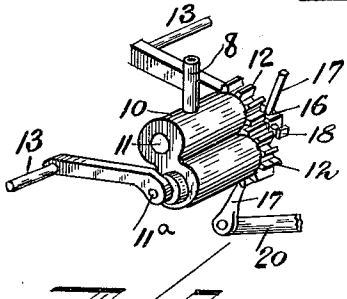


Fig. 3.

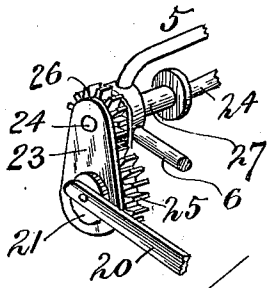


Fig. 2.

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UNITED STATES PATENT OFFICE

GEORGE A. GRAVES, OF JOPLIN, MISSOURI, ASSIGNOR OF ONE-HALF TO JOHN C. McKEE, OF SAME PLACE.

BICYCLE.

SPECIFICATION forming part of Letters Patent No. 544,165, dated August 6, 1895.

Application filed December 13, 1894. Serial No. 531,708. (No model.)

To all whom it may concern:

Be it known that I, GEORGE A. GRAVES, a citizen of the United States, and a resident of Joplin, in the county of Jasper and State of Missouri, have invented certain new and useful Improvements in Bicycles; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to improvements in bicycles; and its object is to provide an improved construction of the same wherein the ordinary chain-gearing is dispensed with and a connecting-rod employed between the treadle-shaft and driving-wheel. Means are also provided for increasing or decreasing the speed of the driving-wheel without changing the speed of the treadles.

The invention consists in the novel construction and combination of parts hereinafter fully described and claimed.

In the accompanying drawings, Figure 1 is a side elevation of a safety-bicycle constructed in accordance with my invention. Fig. 2 is a detail perspective view of the treadles and their shaft. Fig. 3 is a similar view of the driving mechanism.

In the said drawings the reference-numeral 1 designates the front wheel, and 2 the rear or driving wheel, of what is known as a "safety-bicycle."

The numeral 3 designates the fork; 4, the steering-bar; 5 5 and 6 6, bars connected with the axle of the driving-wheel, and 7, 8, and 9 brace-bars constituting the bicycle-frame.

The parts so far described may be of any ordinary or suitable construction, as they form no part of my invention.

Secured to the front ends of the bars 6 6 are brackets or boxes 10, in which are journaled two shafts 11 and 11^a, each of which is provided at one end with intermeshing pinions 12. The said shafts at opposite ends are provided with treadles 13. Passing through a slot 16 in one of the treadles is an arm 17, which is adjustable therein and held in place by means of a set-screw 18. Pivoted to the lower end of this arm is a rearwardly-extending pitman or rod 20, the opposite end of which is secured to a sleeve 21, journaled in a crank 23, consisting of two plates, which rotate on a shaft 24, journaled in bearings secured to the bicycle-frame. The sleeve 21 has secured to it a pinion 25, which is located between the two plates comprising the crank 23, and which meshes with a pinion 26, fixed to a sleeve 27, journaled on shaft 24, and to which the driving-wheel is secured.

The operation is as follows: The treadles are alternately depressed and elevated by the action of the rider. This movement will cause the lower end of the arm carrying the pitman to oscillate back and forth, and the rear end of the said rod, carrying the sleeve and fixed pinion, will revolve about the shaft of the driving-wheel, which pinion, intermeshing with the pinion fixed to the sleeve of the driving-wheel, will cause the latter to be rotated one or more times for every revolution, according to the relative proportions of the two pinions. By varying the length of the treadles and changing the relative sizes of the said pinions any desired speed of the driving-wheel may be attained. By adjusting the arm 17 the stroke of the pitman 20 can be changed or regulated.

Having thus fully described my invention, what I claim is—

In a bicycle, the combination with the frame, the treadle shaft, the intermeshing pinions secured thereto, the treadles and the adjustable arm connected with one of said treadles, of the pitman, the sleeve secured thereto, the crank in which said sleeve is journaled, the pinion fixed to said sleeve, the intermeshing pinion, the shaft upon which said crank rotates, the sleeve mounted upon said shaft, and the driving-wheel secured to said sleeve, substantially as described.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

GEORGE A. GRAVES.

Witnesses:
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W. W. COCHRAN.