(No Model.)

H. TUTTLE.

MECHANICAL MOVEMENT FOR BICYCLES.

No. 564,665. Patented July 28, 1896.

Fig. 1.

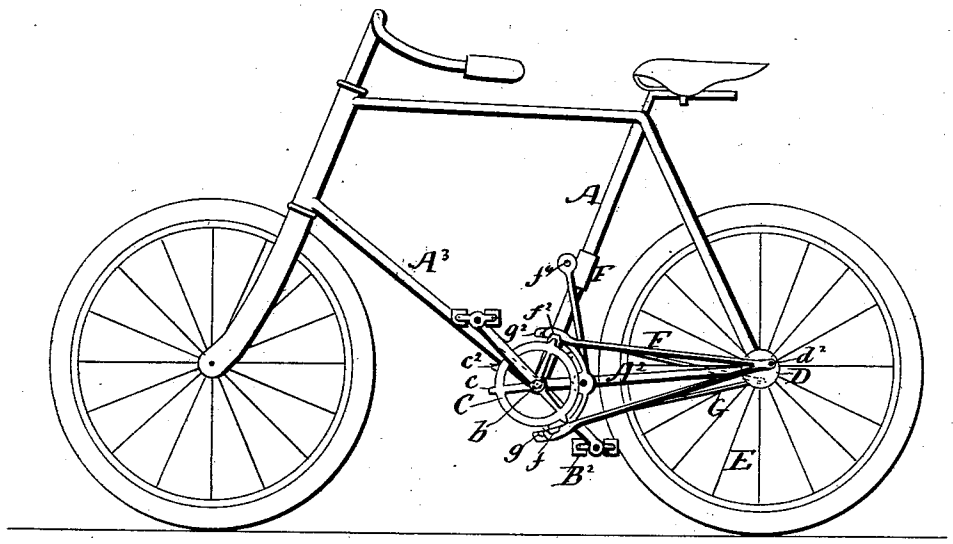

Fig. 2.

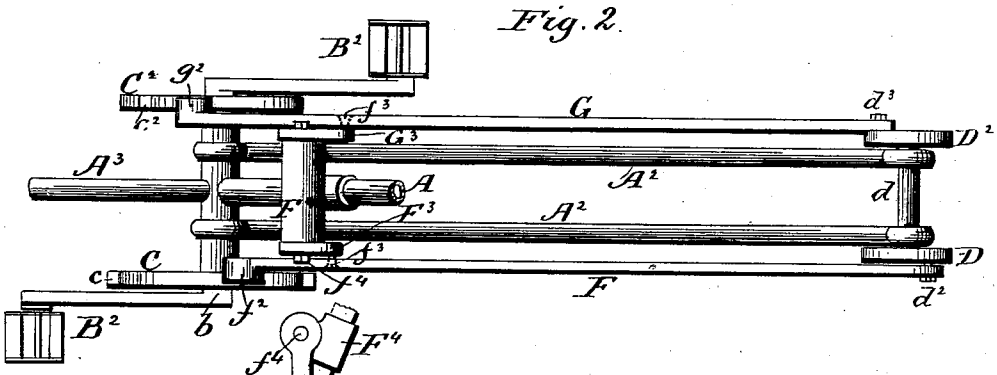

Fig. 3.

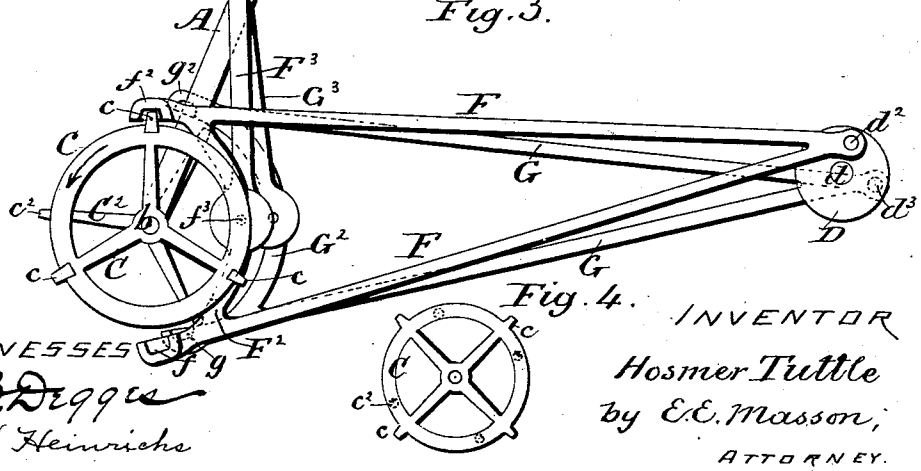

Fig. 4.

WITNESSES
A. B. Driggs
L. L. Heinrichs

INVENTOR
Hosmer Tuttle
by E. E. Masson,
ATTORNEY.

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

UNITED STATES PATENT OFFICE.

HOSMER TUTTLE, OF CEDAR RAPIDS, IOWA.

MECHANICAL MOVEMENT FOR BICYCLES.

SPECIFICATION forming part of Letters Patent No. 564,665, dated July 28, 1896.

Application filed March 12, 1896. Serial No. 582,846. (No model.)

To all whom it may concern:

Be it known that I, HOSMER TUTTLE, a citizen of the United States, residing at Cedar Rapids, in the county of Linn and State of Iowa, have invented certain new and useful Improvements in Mechanical Movements for Bicycles, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to mechanical movements intended mainly for the propulsion of bicycles, to take the place of the chain now generally used on safety-bicycles, and thereby reduce the expense and the amount of friction on the machine.

Although the construction of the movement can be used in connection with other machines, it is shown in the drawings in connection with a bicycle, the frame of which may be of any suitable form.

In said drawings, Figure 1 represents a side view of a bicycle provided with a propulsion mechanism constructed in accordance with my invention. Fig. 2 represents on a larger scale a top view of the propulsion mechanism. Fig. 3 represents a side view of the same with the pedals and the horizontal portion of the frame removed. Fig. 4 represents a side view of a sprocket-wheel provided with a larger number of sprockets arranged to transmit a slower motion to the driving-wheel.

In Figs. 1, 2, and 3 the propulsion mechanism shown is equal to what is termed "eighty-four gear," but has more leverage on the sprockets. The shaft of the rear wheel makes three revolutions to one of the pedal-carrying shaft. If each pedal-carrying sprocket-wheel has four sprocket-teeth and is made of smaller diameter, as shown in Fig. 4, the hind wheel will make two revolutions to one of the pedal-cranks and will produce a suitable speed for climbing hills.

In said drawings, A represents the seat-carrying standard of the frame, and A^2 the braces between the crank-shaft *b*, carrying the pedals B^2 and the sprocket-wheels C and C^2 and the axle *d* for the hind wheel E, said axle *d* carrying also on its ends disks D and D^2, carrying crank-pins. The wheel C has projecting from its periphery at equal distances apart three teeth *c*, to be received alternately between two teeth constituting a pocket *f*, placed on the front end of the lower branch of a forked connecting-rod F. A similar but inverted pocket f^2 is placed on the front end of the upper branch of the forked connecting-rod F. The distance between the front ends of the branches of the forked rod F is about equal to the diameter of the wheel C with the addition of one of its sprockets. Said distance is maintained by a curved brace F^2, uniting said branches. The front portion of the connecting-rod F is suspended from the standard A by means of a link F^3, having its lower end pivoted at f^3 to the curved brace F^2 and its upper end pivoted upon a short shaft f^4, received in a sleeve-bearing F^4, secured to the standard A. The united rear ends of the branches of the connecting-rod F are provided with an eye that receives a crank-pin d^2, projecting from the outer side of the disk D.

The above description relates to the left-hand half of the driving mechanism, but the mechanism on the right-hand side is exactly similar, and consists of the forked connecting-rod G, having the curved brace G^2, that has its front end suspended from the link G^3, The upper end of said link is pivoted upon the short shaft f^4. The lower branch of the connecting-rod G has a pocket *g* and the upper branch an inverted pocket g^2. The united rear ends of said branches are provided with an eye that receives a crank-pin d^3, projecting from the outer side of the disk D^2. The wheel C^2 is provided with three sprockets c^2, equally spaced apart, but so timed relatively to the sprockets *c* of the wheel C as to be about thirty degrees in the rear of each one of them. To obviate dead-centers in the revolution of the disks, the crank-pin of one of the disks is placed at ninety degrees, or one-quarter of a revolution in advance of the other.

The front and rear ends of the braces A^2 of the frame can be provided with ball-bearings as commonly used on bicycles. Said frame is provided with a forward brace A^3, as usual.

In the operation of the mechanism the rocking up and down of the rear end of the connecting-rod F or G causes an inverse motion of the front end of said rod. In other words,

when the crank-pin d^2 on the rear end begins to ascend above a horizontal line passing through the center of the disk D its front end descends and its pocket f^2 receives into engagement the top sprocket c, as shown in Figs. 1 and 3, and said sprocket, in its revolution, pulls upon the rod F and continues to revolve the disk D and the axle d. When the crank-pin d^2 descends below a horizontal line passing through the center of the disk, the front end of the rod F ascends and its pocket f receives into engagement the bottom sprocket of the wheel C, and said sprocket pushes the connecting-rod F rearwardly and continues to revolve the disk D.

As there must necessarily be some moments in which the pockets of the rod F are not in engagement with either a top or a bottom sprocket, the duplication of the mechanism is required to actuate the disk D^2 and its axle d during these intermediate movements. Taking, for example, the position of the parts shown in Fig. 3, the next engagement will be the upper sprocket c^2 with the upper pocket g^2 of the right-hand side rod G. This is followed by the engagement of a bottom sprocket c with the bottom pocket f of the left-hand side lever F, and this is followed by the engagement of a bottom sprocket c^2 with the bottom pocket g on the right-hand side lever G. The next engagement is as shown in Figs. 1 and 3.

In Fig. 4 a sprocket-wheel is shown with four sprockets c, well adapted for bicycles geared for slower motion. This wheel is to be accompanied by a similar wheel having sprockets c^2 suitably in the rear of the spockets c. The sprockets c^2 are represented as pins on the side of the wheel, as pins could be used in place of peripheral sprocket-teeth.

Having now fully described my invention, I claim—

1. A mechanical movement consisting of an axle carrying two crank-pins, a forked connecting-rod mounted at one end upon each crank-pin and having at the opposite end two oppositely-disposed pockets, a suspension-link for each connecting-rod, and sprocket-wheels for engagement with the pockets of each connecting-rod, substantially as described.

2. In a mechanical movement for bicycles the combination of the axle of one of the carrying-wheels, two crank-pins carried by said axle, two branched connecting-rods mounted at one end upon each crank-pin and having at the opposite end two oppositely-disposed retainers for sprocket-teeth, a suspension-link for each connecting-rod, and sprocket-wheels having sprocket-teeth for engagement with the sprocket-retainers carried by the branches of the connecting-rods substantially as described.

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

HOSMER TUTTLE.

Witnesses:
A. P. FUHRMEISTER,
R. F. MINOR.