

(No Model.)

2 Sheets—Sheet 1.

F. L. EAGER.
DRIVING MECHANISM FOR CYCLES.

No. 520,638.

Patented May 29, 1894.

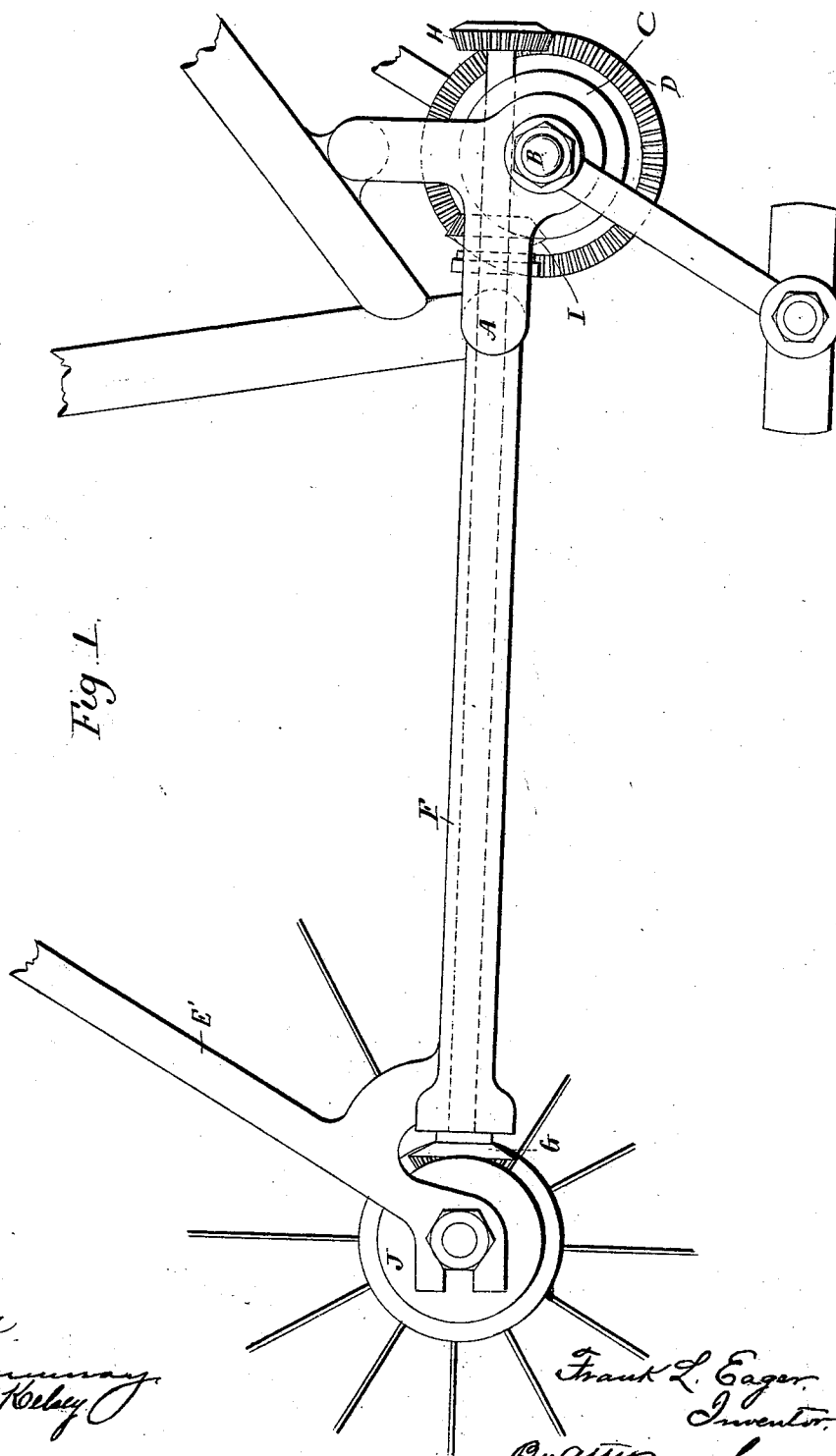


Fig. 1.

Witnesses
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William D. Kelley

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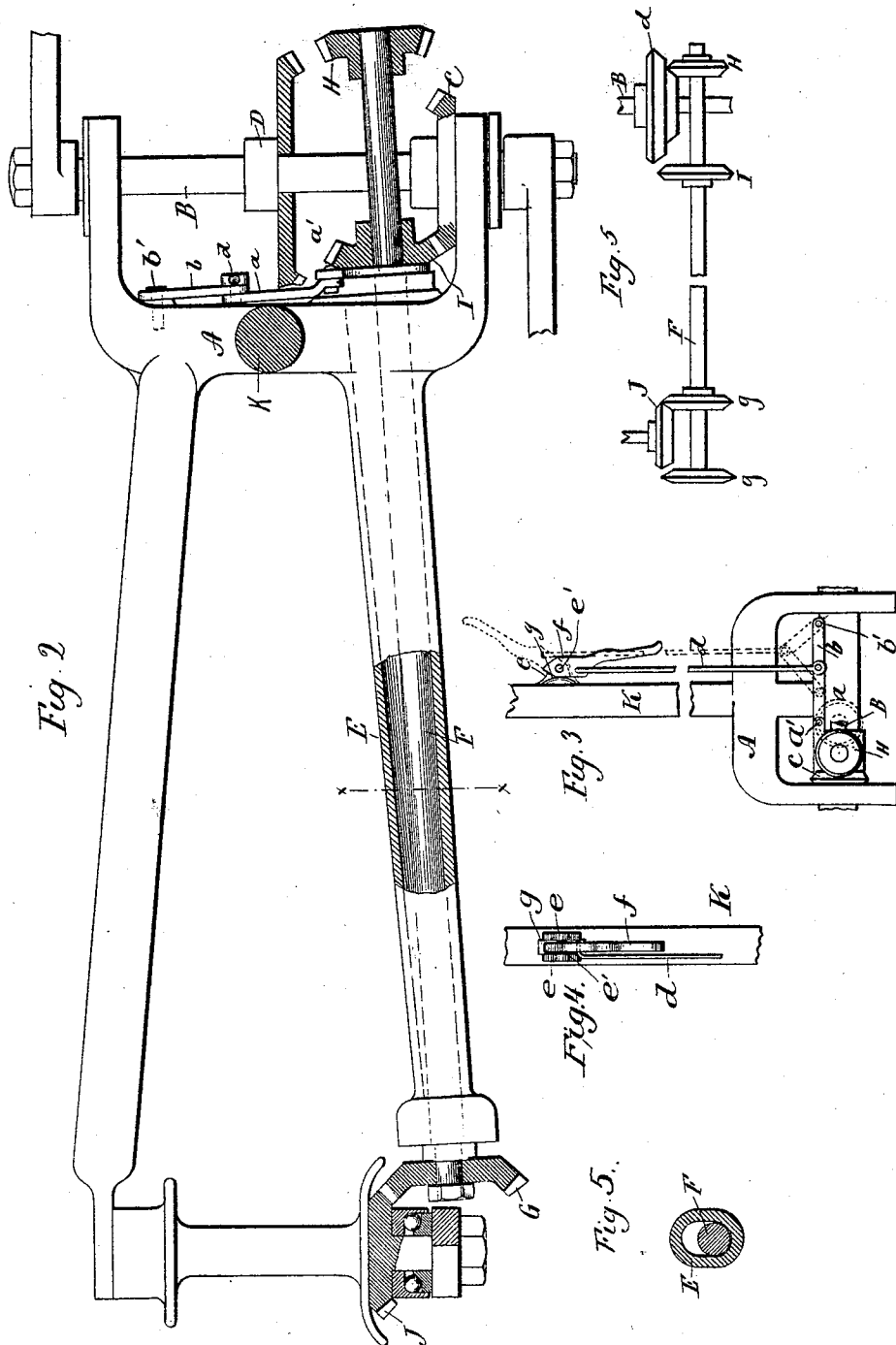
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UNITED STATES PATENT OFFICE.

FRANK L. EAGER, OF MERIDEN, CONNECTICUT.

DRIVING MECHANISM FOR CYCLES.

SPECIFICATION forming part of Letters Patent No. 520,638, dated May 29, 1894.

Application filed October 2, 1893. Serial No. 486,996. (No model.)

To all whom it may concern:

Be it known that I, FRANK L. EAGER, of Meriden, in the county of New Haven and State of Connecticut, have invented a new Improvement in Driving Mechanism for Cycles; and I do hereby declare the following, when taken in connection with accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a side view, of a portion of a bicycle frame showing the application of my invention thereto; Fig. 2, a top view of the same, portion of the brace and rear wheel broken away; Fig. 3, a front view of the same on a reduced scale, illustrating one method of moving the shaft; Fig. 4, a side view of the upper portion of Fig. 3, to further illustrate the arrangement of the shifting lever; Fig. 5, a transverse section on line $x-x$ of Fig. 2.

This invention relates to an improvement in driving-gears for cycles, and particularly to that class in which gears are arranged on the crank-shaft and on the rear wheel, with connections between them, whereby movement of the crank-shaft imparts corresponding movement to the rear wheel, and more particularly to that class of cycles in which differential gears are arranged on the crank-shaft, so that variable speed may be attained.

In the more general arrangement of this class of cycles, the gears on the shaft are longitudinally movable. The object of this invention is to permanently fix the gears to the connecting shaft, and so move the said shaft and gears as to throw them out of mesh with one gear on the crank-shaft, and into mesh with a gear of different diameter on the same crank-shaft, and the invention consists in the construction as hereinafter described and particularly recited in the claims.

In carrying out the invention, the mechanism may be applied to any style of cycle, but for convenience I will describe it as applied to a "Victor" wheel.

A, represents the support for the crank-shaft B, which is moved by pedals B' in the usual manner, and is provided with a gear-wheel C at one side, and a second gear-wheel D, near its center, of somewhat larger diameter than the gear-wheel C, said gears being

arranged between the arms of the support. One of the braces E, which extends from the support A, to the rear brace E', is tapering and hollow, forming an elliptical sleeve, as shown in Fig. 4. Within the brace E, a shaft F, is arranged, suitably supported therein, and provided at its rear end with a bevel-gear G, and at its forward end with a bevel-gear H, adapted to mesh with the gear D, and also near the said forward end with a gear I, adapted to mesh with the gear C. The rear wheel is provided with a suitable gear J, in mesh with the gear G. To operate the shaft F, and so as to change the gear connection at its forward end, I connect the shaft to the support by two links $a b$, one link a being secured to the said shaft by a pivot a' , and the other link b to the support as at b' , the meeting ends of the said links are pivotally connected to an operating rod d , which extends to any convenient point in the machine, and so that an upward movement of the rod will move the forward end of the shaft out of mesh with the gear C, and into mesh with the gear D. As a convenient means for operating this rod d , I have illustrated it as applied to the upright brace K, which is constructed with ears e , between which on a pivot e' a fulcrum lever f , is hung the connecting rod d being secured to the lever below its pivot, and so that when the fulcrum lever f is turned upward, as indicated in broken lines, it will operate the links $a b$ to shift the shaft F. To hold said fulcrum lever f in its up or down position, I arrange a spring g between the ears $e e$ on the brace K, said spring bearing against the brace and on the lever above its connection with the rod d , so as to hold the lever in its closed position. When said fulcrum-lever f is turned upward, the spring will be depressed to allow it to so turn, and when the lever is in its full up position, the spring will take a bearing on the opposite side of said fulcrum lever, and thus hold the connecting rod d in the up position.

In operation, the shaft normally stands so that the gear I, is in mesh with the gear C, and when it is desired to increase the speed, the fulcrum lever f is turned upward, as indicated in broken lines Fig. 3, which thus draws the rod d upward, operating the links $a b$, which in turn draw the shaft F toward

the center of the machine, and so as to bring the gear H into mesh with the gear D, the movement of the gear G at the rear end of the machine being so slight as not to interfere with its connection with the gear J. To reverse the operation, it is simply necessary to turn the said fulcrum lever *f* downward, which will again throw the shaft F into its former position.

10 The gears H and I being permanently fixed to the shaft F, avoid any possibility of displacement, and permit the change of gearing to be readily performed at the will of the rider.

15 It will be understood that in applying this invention to cycles of various makes, certain changes in the arrangement of the parts may be necessary, I therefore do not wish to be understood as limiting the invention to the particular arrangement of parts as shown and described, but

20 What I do claim is—

1. Driving mechanism for cycles, consisting of a shaft mounted in the frame so as to per-

mit rotary and lateral movement, a gear at 25 the rear end in mesh with the gear on the rear wheel, two gears at the forward end adapted to mesh with differential gears on the crank shaft, substantially as described.

2. Driving mechanism for cycles, consisting 30 of a shaft mounted in the frame for rotary and lateral movement, and provided with a gear at its rear end in mesh with a gear on its rear wheel, and with two gears at its forward end, combined with two differential 35 gears on the crank shaft, and means substantially such as described to shift said shaft at the forward end, whereby the gears on said shaft may be thrown out of mesh with one of the gears on the crank-shaft and into mesh 40 with the other, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

FRANK L. EAGER.

Witnesses:

FRED C. EARLE,

LILLIAN D. KELSEY.