

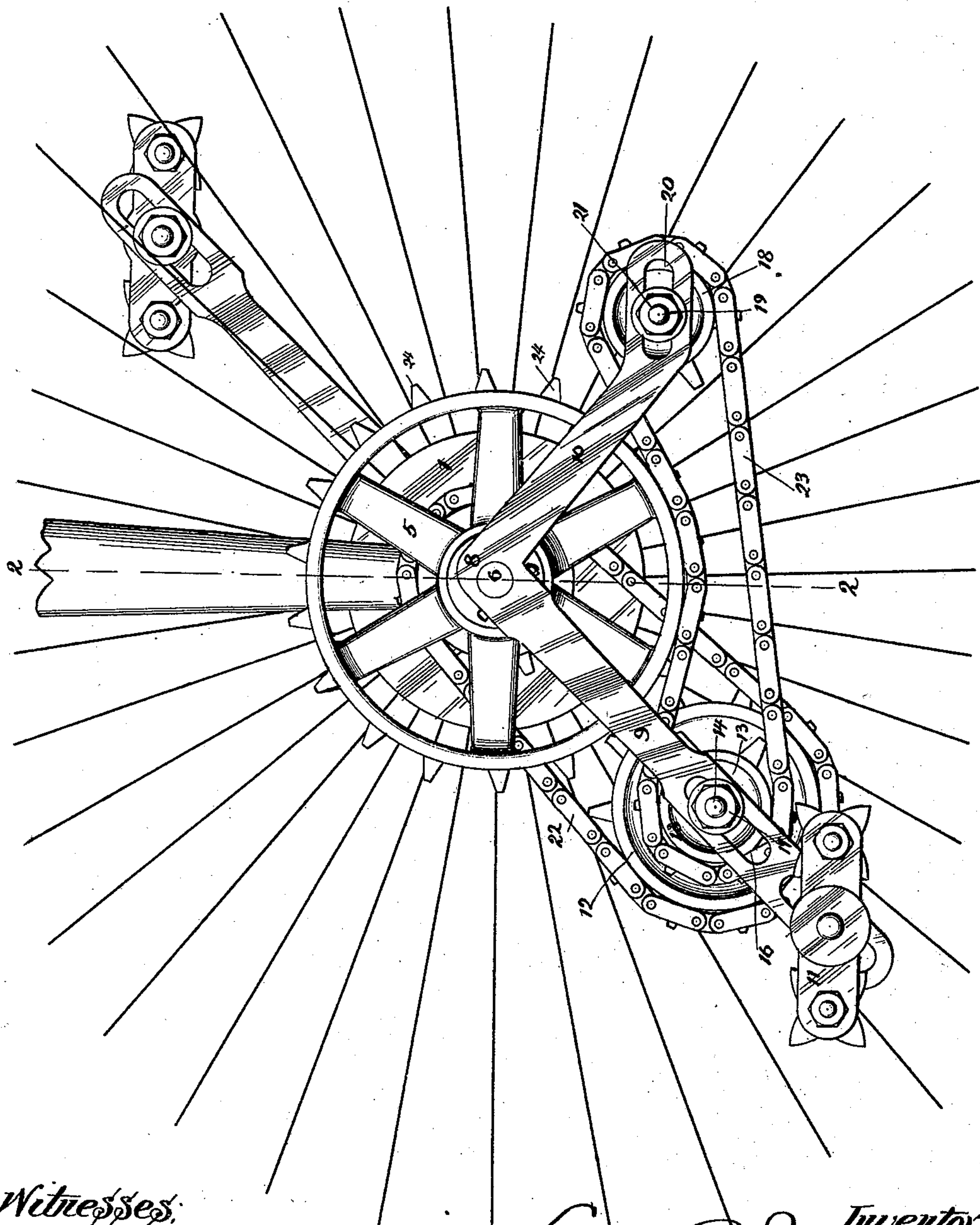
(No Model.)

L. C. JAQUISH.
BICYCLE.

2 Sheets—Sheet 1.

No. 478,752.

Patented July 12, 1892.



Witnesses:

Julia M. Bristol
Ellie McKibbin

Fig. 1.

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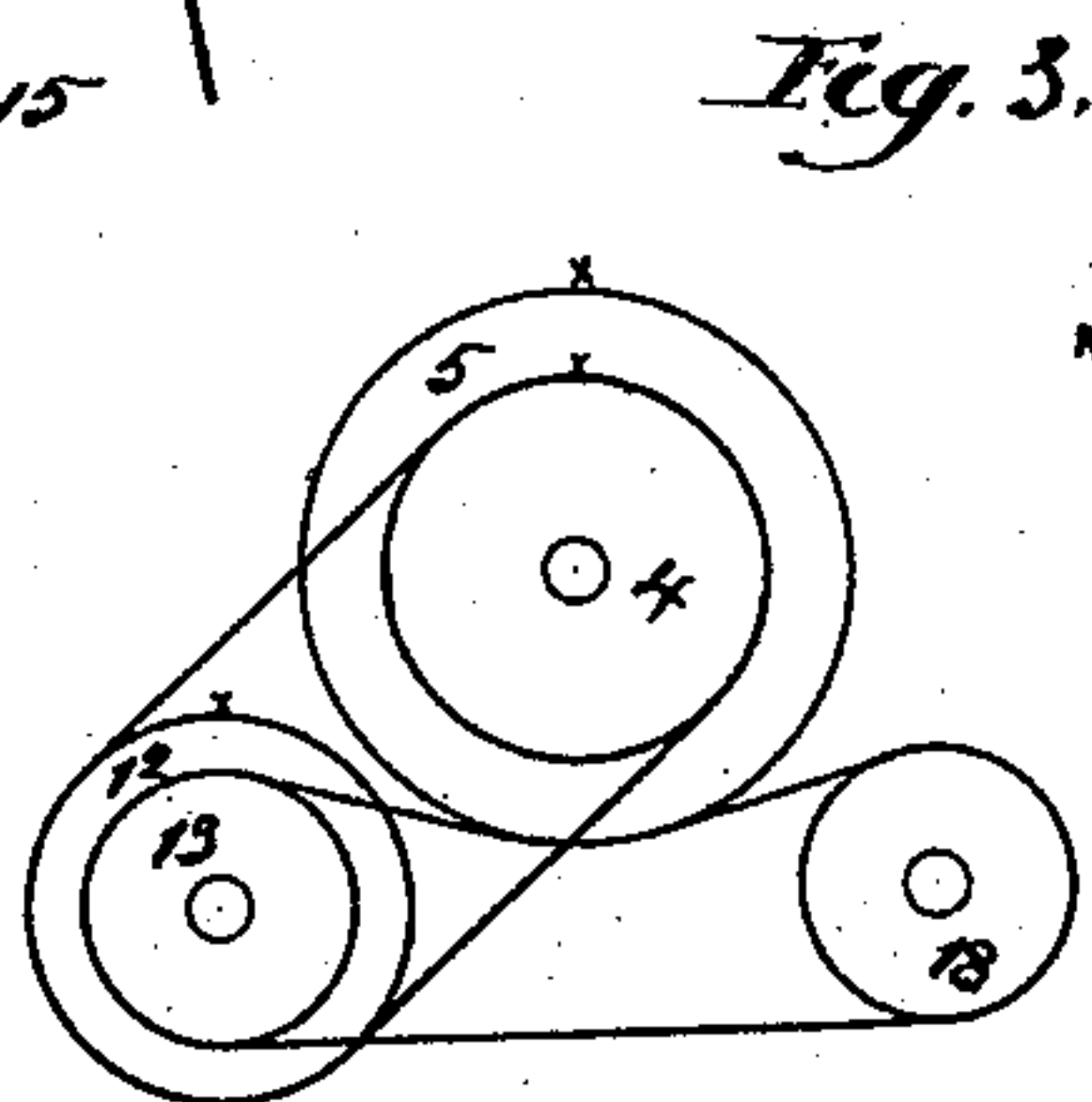
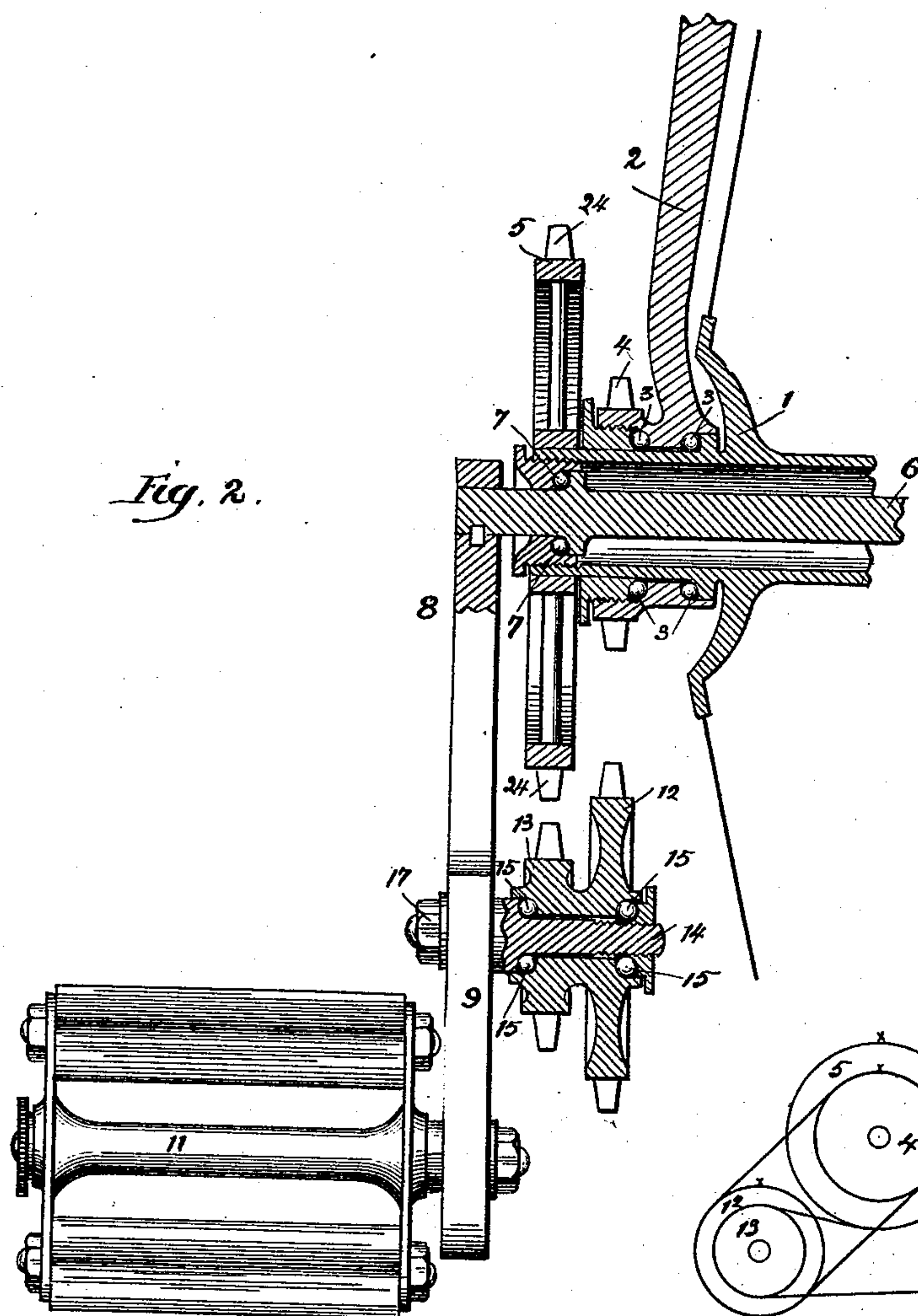
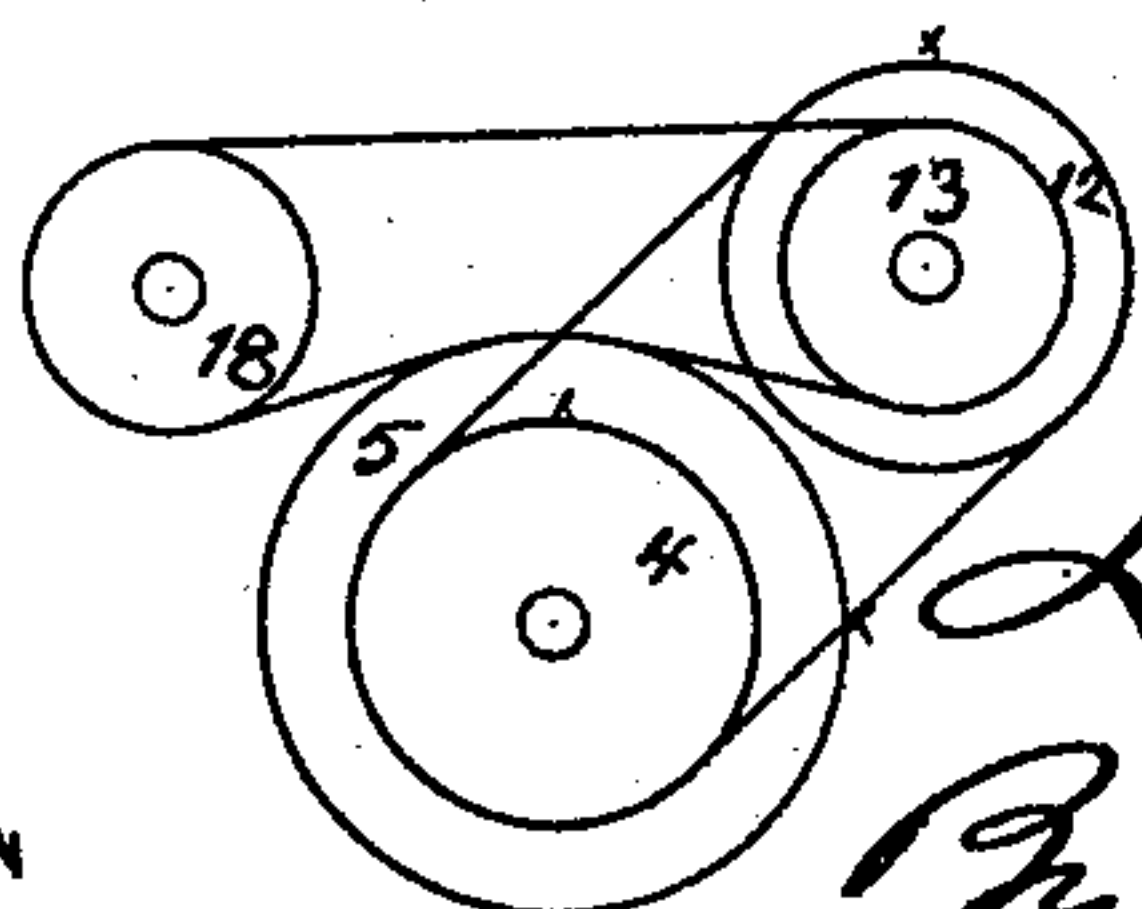


Fig. 4.



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UNITED STATES PATENT OFFICE.

LOUIS C. JAQUISH, OF CHICAGO, ILLINOIS.

BICYCLE.

SPECIFICATION forming part of Letters Patent No. 478,752, dated July 12, 1892.

Application filed March 24, 1892. Serial No. 426,316. (No model.)

To all whom it may concern:

Be it known that I, LOUIS C. JAQUISH, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Bicycles, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation. Fig. 2 is a vertical section on line 2 2 of Fig. 1. Figs. 3 and 4 are diagrams to illustrate the revolution of the wheels.

The object of my invention is to provide a device by means of which bicycles of the type known as the "ordinary" may be speeded—that is to say, a device by means of which the driving-wheel may be given more than one revolution for each revolution of the pedal-crank. I attain this object as hereinafter specified and as illustrated in the drawings.

That which I regard as new will be pointed out in the claims.

In the drawings, 1 indicates a hub of a driving-wheel of a bicycle. The hub 1 is a hollow or sleeve hub and is carried by a fork 2 and turns in ordinary ball-bearings 3.

4 indicates a sprocket-wheel, which is rigidly attached to the lower end of the fork 2 and may be formed, as shown, integral therewith. The sprocket-wheel 4 has a common axis with the hollow hub 1.

5 indicates a sprocket-wheel mounted rigidly upon one end of the hollow or sleeve hub 1, as shown in Fig. 2.

6 indicates a crank-axle, which passes through the hollow hub 1 and turns in ordinary ball-bearings 7.

8 indicates a pedal-crank, which is in the form of a bell-crank lever, having two arms 9 and 10. The pedal-crank 8 at the portion thereof where the two arms 9 and 10 unite is keyed to the crank-axle 6, so as to be rigidly attached thereto and to turn with it.

11 indicates a pedal of the ordinary form, carried upon the arm 9 of the pedal-crank 8 in the usual manner.

12 and 13 indicate two sprocket-wheels having a common axis and either rigidly attached to one another or formed integral with one another, as shown, and carried upon a pin 14 and turning thereon with ordinary ball-bearings 15. The pin 14 is carried in a slot 16 of the

arm 9 of the pedal-crank 8, and is adjustably secured to said arm 9 by means of a nut 17.

18 indicates a sprocket-wheel mounted upon a pin 19 and provided with ordinary ball-bearings, which are not shown in the drawings. The pin 19 is carried in a slot 20 of the arm 10, and is adjustably secured to said arm by means of a nut 21.

22 indicates a sprocket-chain connecting the sprocket-wheels 4 and 12.

23 indicates a sprocket-chain passing around the sprocket-wheels 13 and 18 and engaging with teeth 24 of the sprocket-wheel 5.

In the diagrams Figs. 3 and 4 the sprocket-wheels 4 and 12 are shown as of the same size, and this will be the ordinary construction of the machine, although the size may be varied, as will be hereinafter shown and as indicated in Figs. 1 and 2.

The operation of my device is as follows: For the purpose of illustrating the operation I will assume that the sprocket-wheels 4 and 12 are of the same size. By means of the sprocket-chain passing around the wheels 4 and 12 and connecting them with one another the wheel 12 as it is carried around the axis of revolution of the crank by the revolution of the crank will remain in a fixed position, as far as rotation is concerned, with reference to the sprocket-wheel 4. This, it will be readily perceived, is equivalent to giving the sprocket-wheel 12, and with it the sprocket-wheel 13, which is rigidly attached to it, in each revolution of the pedal-crank one revolution about its axis. By means of the sprocket-chain 23, carried by the sprocket-wheels 13 and 18 and meshing with the teeth 24 of the wheel 5, the wheel 5, and with it the driving-wheel of the bicycle, will be given one revolution for each revolution of the pedal-crank. The sprocket-wheel 12 being held in a fixed position, as above described, in its revolution about the crank-axle 6 at each revolution of the crank, the sprocket-wheel 5, in addition to the revolution produced by the revolution of the pedal-crank, will be given additional motion, depending in amount upon the relative diameters of the sprocket-wheels. This is indicated in the diagrams Figs. 3 and 4, in which the sprocket-wheels 12 and 13 are shown in Fig. 3 as below and in Fig. 4 as above the sprocket-wheels 4 and 5, and yet

the same point indicated by the small star upon the sprocket-wheel 12 is shown as being kept constantly uppermost during the revolution of the sprocket-wheels 12 and 13 above the sprocket-wheels 4 and 5. It is obvious that if the relative diameters of the sprocket-wheels 12 and 4 with reference to one another are changed the added speed given to the sprocket-wheel 5 and thus to the driving-wheel of the bicycle will be made greater or less, according to which of the two wheels is the larger. When the two wheels 4 and 12 are of the same size, the holding of the wheel 12 in one fixed position is equivalent to giving it one rotation about its own axis in each revolution of the pedal-crank and in the opposite direction, and therefore the sprocket-wheel 5, and with it the driving-wheel of the bicycle, will be given an additional motion, depending in amount upon the relative diameters of the wheels 5 and 13. In case the wheel 12 is made smaller than the sprocket-wheel 4 the point indicated by the star upon said sprocket-wheel 12 in the diagrams Figs. 3 and 4 will be turned to the right during the revolution about the pedal-axle, and hence will be given a motion in excess of the equivalent of one rotation upon its own axis during the revolution of the pedal about the pedal-axle. In case the sprocket-wheel 12 is made larger than the sprocket-wheel 4 precisely the reverse will be the case. In other words, the sprocket-wheels 13 and 5 remaining of the same relative size, if the sprocket-wheel 12 is made smaller than the sprocket-wheel 4 the main driving-wheel of the bicycle will be given greater speed than will be given when the wheels 4 and 12 are of the same size. When the wheel 12 is larger than the wheel 4, wheels 5 and 13 remaining of the same relative size, the driving-wheel of the bicycle will be given a less additional speed than will be given it when the wheels 4 and 12 are of the same size. Again, the amount of speed given to the driving-wheel will depend upon the relative diameters of the wheels 13 and 5. It is obvious, then, that I do not confine myself to any fixed proportion between the several sprocket-wheels, as their relative sizes may be varied to suit the circumstances of the case and the desire of the maker of the wheel.

The object of the sprocket-wheel 18 is to provide means for driving the sprocket-wheel 5 by the sprocket-wheels 12 and 13 without crossing the chain 23, as it is obvious that if the sprocket-wheel 13 were connected directly with the wheel 5 by a sprocket-chain the chain would have to be crossed. Otherwise the rotation given to the wheel 5 by the fixed position of the wheels 12 and 13 in their revolution with the pedal-crank about its axis would be in a direction opposite to the rotation of the wheel 5 caused by the revolution of the pedal-crank.

I have shown my device applied to only one side of the main wheel of the bicycle, and this is the construction I prefer. It is obvious,

however, that it may be applied upon both sides of the wheel, if desired.

That which I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with a hub, a wheel rigidly attached thereto, a crank-axle journaled in said hub, and a bell-crank lever connected to said crank-axle, of mechanism operated from said lever to rotate said wheel and to give said wheel a rotary movement in addition to that caused by the rotation of the said lever, substantially as described.

2. The combination, with a hollow hub, a sprocket-wheel rigidly attached thereto, a crank-axle journaled in said hub, a bell-crank lever connected to said crank-axle, and a sprocket-wheel carried upon each arm of said lever, of mechanism operated from said lever and sprocket-wheels to rotate said sprocket-wheel attached to said hub with a rotation of said bell-crank lever and to give to said sprocket-wheel attached to said hub a rotary motion in addition to the rotation caused by the rotation of said bell-crank lever, substantially as described.

3. The combination, with a hollow hub 1, a wheel 5, rigidly secured thereto, and a crank-axle 6, journaled in said hub, of a bell-crank lever 8, secured to said crank-axle and having two arms 9 and 10, wheels 12 and 13, rigidly attached to one another upon a common axis and rotatably secured to the arm 9 of the bell-crank lever 8, and mechanism adapted to rotate said wheel 5 as the wheels 12 and 13 are revolved with said bell-crank lever about the center of revolution and to give a rotary movement to said wheel 5 in addition to the rotation caused by the rotation of said bell-crank lever, substantially as described.

4. The combination, with a hollow hub 1, a wheel 5, rigidly secured thereto, and a crank-axle 6, journaled in said hub, of a bell-crank lever 8, secured to said crank-axle and having two arms 9 and 10, a pedal 11, carried by said arm 9 of said lever 8, wheels 12 and 13, rigidly attached to one another upon a common axis and rotatably secured to said arm 9 of the bell-crank lever 8, and mechanism adapted to rotate said wheel 5 as the wheels 12 and 13 are revolved with said bell-crank lever about the center of revolution and to give a rotary movement to said wheel 5 in addition to the rotation caused by the rotation of said bell-crank lever, substantially as described.

5. The combination, with a fork of a bicycle 2, a sprocket-wheel 4, rigidly secured to the lower end of said fork 2, a hollow hub 1, and a sprocket-wheel 5, rigidly secured to said hollow hub, of a crank-axle 6, journaled in said hub, a bell-crank lever 8, secured to said crank-axle 6 and having two arms 9 and 10, sprocket-wheels 12 and 13, rigidly connected with one another upon the same axis and rotatably secured to the arm 9 of the bell-crank lever 8, a sprocket-wheel 18, rotatably secured to the arm 10 of the bell-crank lever 8, sprock-

et-chain 22, passing around the sprocket-wheels 12 and 4, and a sprocket-chain 23, passing around the sprocket-wheels 13 and 18 and adapted to engage with the sprocket-wheel 5, substantially as and for the purpose specified.

6. The combination, with a fork of a bicycle 2, a sprocket-wheel 4, rigidly secured to the lower end of said fork 2, a hollow hub 1, and a sprocket-wheel 5, rigidly secured to said hollow hub, of a crank-axle 6, journaled in said hub, a bell-crank lever 8, secured to said crank-axle 6 and having two arms 9 and 10, sprocket-wheels 12 and 13, rigidly connected with one another upon the same axis and rotatably secured to the arm 9 of the bell-crank lever 8, a sprocket-wheel 18, rotatably secured to the arm 10 of the bell-crank lever 8, mechanism for adjusting said wheel 18 in position upon said arm 10, sprocket-chain 22, passing around the sprocket-wheels 12 and 4, and a sprocket-chain 23, passing around the sprocket-wheels 13 and 18 and adapted to engage with the sprocket-wheel 5, substantially as and for the purpose specified.

7. The combination, with a fork of a bicycle 2, a sprocket-wheel 4, rigidly secured to the lower end of said fork 2, a hollow hub 1, and a sprocket-wheel 5, rigidly secured to said hollow hub, of a crank-axle 6, journaled in said hub, a bell-crank lever 8, secured to said crank-axle 6 and having two arms 9 and 10, a pedal carried upon said arm 9 of said lever 8, sprocket-wheels 12 and 13, rigidly connected with one another upon the same axis and rotatably secured to the arm 9 of the bell-crank lever 8, a sprocket-wheel 18, rotatably secured to the arm 10 of the bell-crank lever 8, mechanism for adjusting said wheel 18 in position upon said arm 10, sprocket-chain 22, passing around the sprocket-wheels 12 and 4, and a sprocket-chain 23, passing around the sprocket-wheels 13 and 18 and adapted to engage with the sprocket-wheel 5, substantially as and for the purpose specified.

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Witnesses:

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