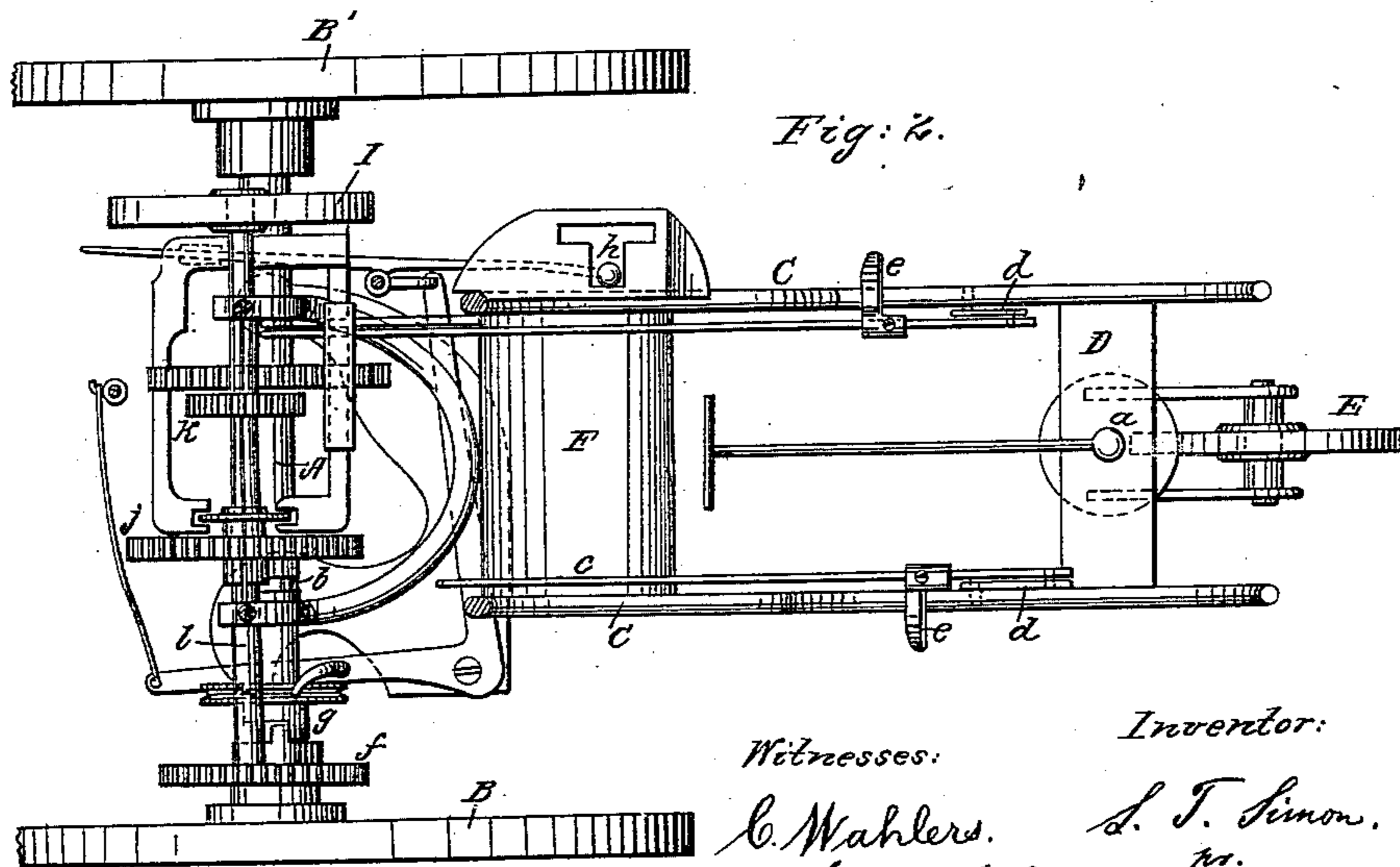
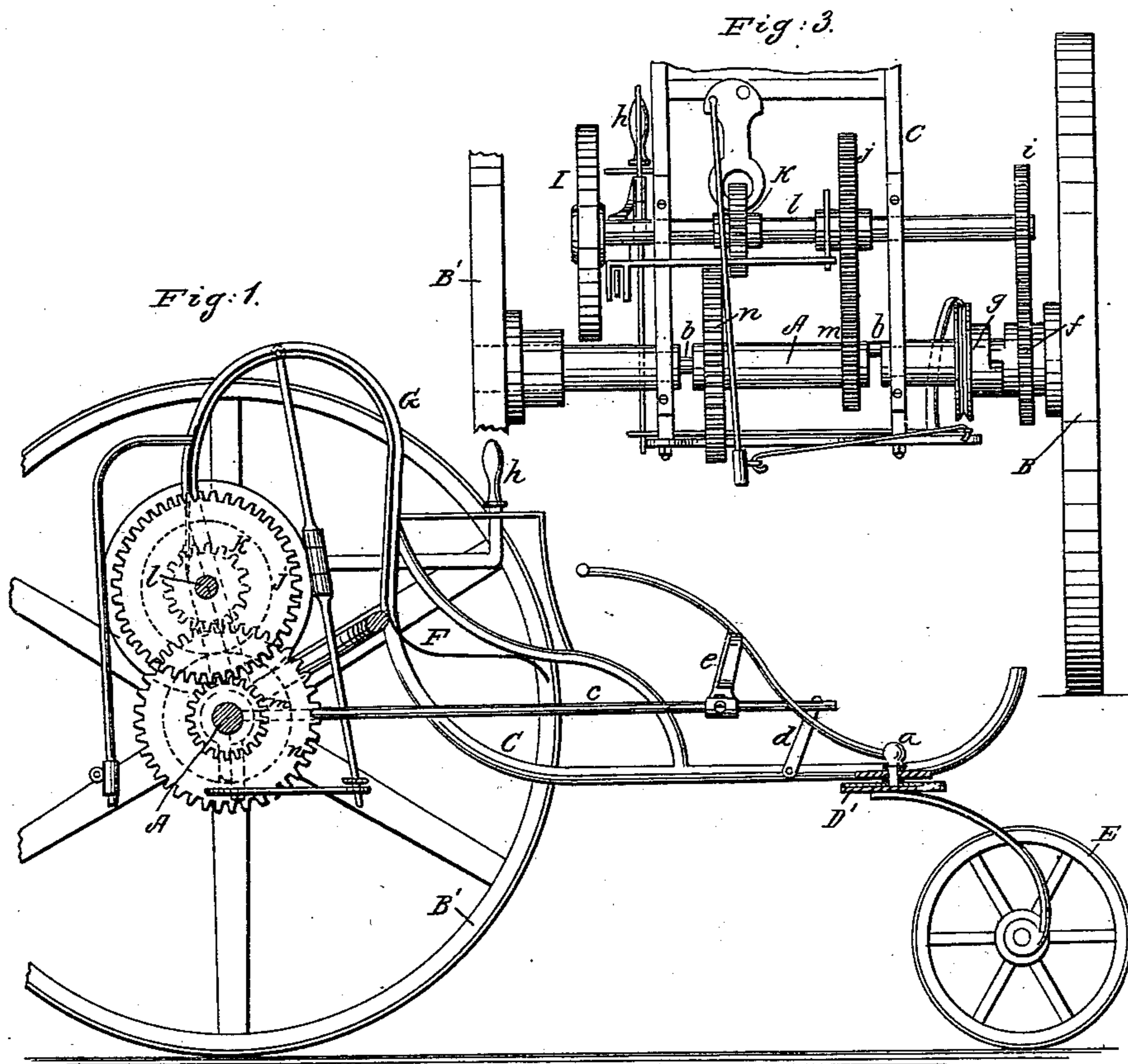


L. T. SIMON.

Velocipede.

Patented Aug. 17, 1869

No. 93,915.



Witnesses:
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Letters Patent No. 93,915, dated August 17, 1869.

IMPROVEMENT IN VELOCIPEDES.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, LOUIS TH. SIMON, of the city, county, and State of New York, have invented a new and useful Improvement in Velocipedes; and I do hereby declare the following to be a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawing, forming part of this specification, in which drawing—

Figure 1 represents a longitudinal vertical section of this invention.

Figure 2 is a sectional plan of the same.

Figure 3 is a rear elevation of the back-gear detached.

Similar letters indicate corresponding parts.

This invention consists of a shoulder-rest in a plane, at right angles or nearly so with the direction in which the foot-pieces move, said foot-pieces being secured to rods which are supported at one end by the cranks of the driving-axle, and at the opposite end by links pivoted to the frame or reach of the velocipede, in such a manner that said back-rest forms a *point d'appui* for the rider, enabling him to exert his full power with the best possible advantage in propelling the velocipede.

The invention consists, further, in the arrangement of a back-gear, in combination of a series of gear-wheels mounted on the driving-axle, with a clutch which serves to couple the driving-wheel and axle together, and with a lever which governs the back-gear and clutch in such a manner, that by the action of said lever the back-gear and the clutch can be thrown in or out of gear, and thereby the rider is enabled to multiply the power and decrease the speed in going up-hill, or to throw the driving-wheel and back-gear out of gear with the crank-axle in going down-hill, or to multiply the speed in going on a level surface, or to throw the back-gear entirely out of action, while the driving-wheel is coupled to the crank-axle, if the rider desires to travel at the ordinary speed, thus producing a velocipede which admits of four changes to suit the speed at which the rider desires to travel and the formation of the ground to be passed over.

In the drawing—

The letter A designates the main or driving-axle of a velocipede, on which are two wheels, B B', revolving freely on the same, and which connects, by a reach, or frame, C, with the platform D, that forms the bearing for king-bolt *a* of the steering-wheel E.

The axle A is provided with two cranks, *b*, which connect, by means of rods *c*, with links *d*, that are pivoted to the reach C, so that the connecting-rods *c* reciprocate in a horizontal plane, or nearly so.

To said connecting-rods are secured the foot-pieces *e*, which are adjusted at suitable distances from the seat F. This seat is supported by the reach C, and it

is provided with a high back, or shoulder-rest, G, extending upward, at right angles or nearly so to the direction in which the foot-pieces *e* move, so that it forms a *point d'appui*, supporting the rider while acting on the foot-pieces, and enabling him to exert his full power in propelling the velocipede.

This arrangement of the shoulder-rest is of the greatest importance, since it enables the rider to bear with his feet on the foot-rests, while his back and shoulders press against and are sustained by the shoulder-rest, whereas, in velocipedes of the ordinary construction, the seat is usually made without a back-rest, or if there is a back-rest, it is not high enough to support the shoulders, and it serves to prevent the rider from sliding off from the seat, but it never is in such a position in relation to the foot-pieces that it forms a *point d'appui*, enabling the rider to exert his full power on the foot-pieces.

The wheels B B' revolve freely on the axle A, and to the hub of one of the wheels, B, which forms the driving-wheel, is firmly secured a cog-wheel, *f*, which is provided on its inner surface with one or more projections, to engage with the clutch *g*.

This clutch is secured to the axle A by means of a feather-key, so that it can be moved toward and from the cog-wheel *f*, and it is connected by suitable levers and rock-shafts with the hand-lever *h*, so that by depressing said hand-lever, the clutch can be made to engage with the projections on the inner surface of the cog-wheel *f*, and thereby the driving-wheel is coupled together with the axle A. In this case the driving-wheel B makes one revolution for each revolution of the axle A, and the velocipede is propelled with the ordinary speed.

If it is desired to multiply the speed or the power, the back-gear is brought into action. This back-gear consists of three gear-wheels, *i j k*, mounted on a counter-shaft, *l*, which extends across the reach C, parallel to the axle A, and of the cog-wheel *f*, and two other cog-wheels, *m n*, mounted on the axle A.

The cog-wheel *i* is mounted firmly on the counter-shaft *l*, and is always in gear with the cog-wheel *f*, but the cog-wheels *j k* are secured to said counter-shaft by means of feather-keys, so that they can be thrown in or out of gear with the wheels *m n*, and the proportion between the wheels *j* and *m* is such, that if these two are thrown in gear, the axle A makes two or more revolutions to one of the counter-shaft *l*, while the proportion between the wheels *k* and *n* is the reverse, giving two or more revolutions to the counter-shaft for each revolution of the axle A.

The wheels *j k* connect, by suitable levers and rock-shafts, with the hand-lever *h*, and these connections are so arranged, that by raising the hand-lever partly up and moving it in toward the seat, the cog-wheel *j*

is thrown in gear with the cog-wheel *m*, while at the same time the clutch is thrown out of gear with the cog-wheel *f*, and in this case the axle A makes two or more revolutions to one of the driving-wheel B, and, consequently, the power is multiplied, while the speed is proportionally reduced.

In order to throw the wheel *k* in gear with cog-wheel *n*, the hand-lever *h* is forced back, away from the seat, and then raised up. By this motion the wheel *j* is thrown out of gear with the wheel *m*, while the clutch *g* remains out of gear with the cog-wheel *f*, and in this case the driving-wheel B makes two or more revolutions to one of the axle A, and, consequently, the speed is increased, while proportionally more power is required to propel the velocipede.

By depressing the hand-lever half way, the wheels *j* and *k* are both thrown out of gear, while the clutch *g* remains out of gear with the cog-wheel *f*. In this case the driving-wheel B revolves independent of the axle, so that in going down-hill the axle and the foot-pieces remain stationary, and the rider has time to rest.

On level ground, the speed-multiplying gear may be used, but in going up-hill the power-multiplying gear is brought into action, and all the changes can be made while the velocipede is in motion.

A fly-wheel, I, mounted on the countershaft *l*, serves to equalize the motion of the machine.

Having thus described my invention,

What I claim as new, and desire to secure by Letters Patent, is—

1. The shoulder-rest G, arranged, in combination with the adjustable foot-pieces *e*, upon rod *c*, so as to form a point of support to enable the rider to apply his full power in propelling the velocipede, as set forth.

2. The hand-lever *h* and cog-wheels *i j k f m n*, and clutch *g*, in combination with the driving-wheel B and crank-axle A, all constructed and operating substantially in the manner shown and described.

LOUIS TH. SIMON.

Witnesses:

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