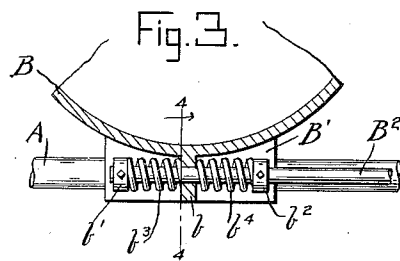
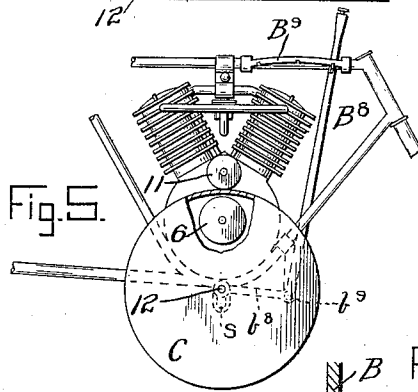
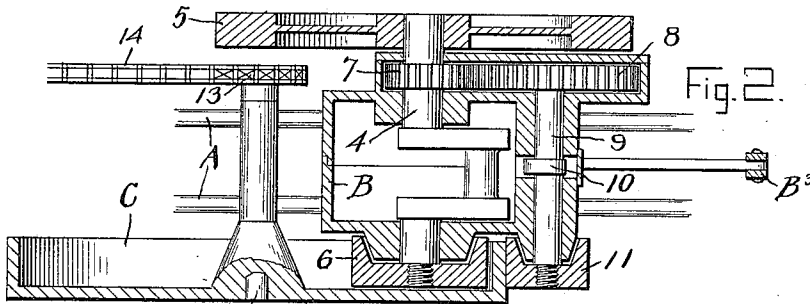
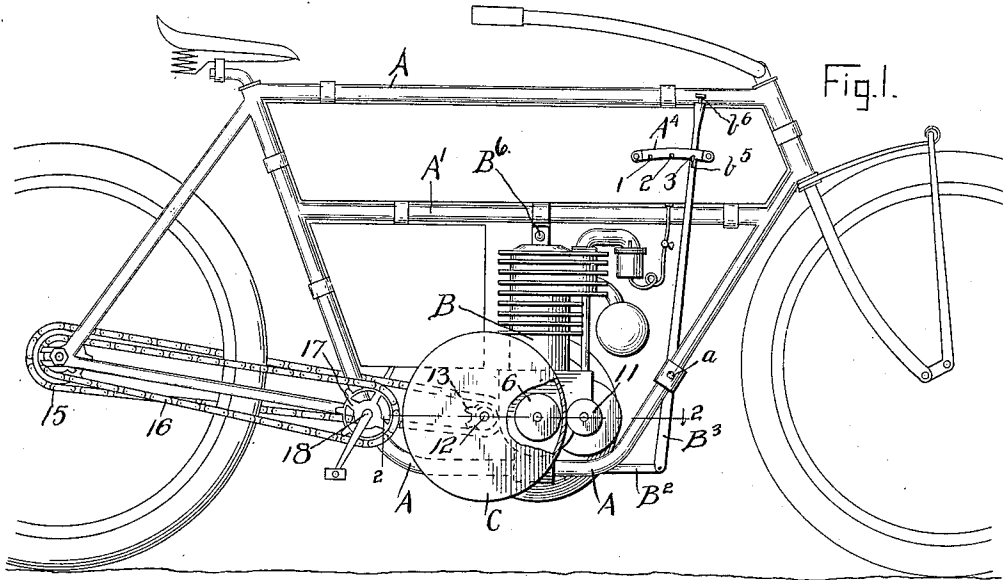


W. C. BOND.
MOTOR CYCLE.
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1,064,602.

Patented June 10, 1913.



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WILLIAM CHARD BOND, OF WASHINGTON, DISTRICT OF COLUMBIA.

MOTOR-CYCLE.

1,064,602.

Specification of Letters Patent.

Patented June 10, 1913.

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To all whom it may concern:

Be it known that I, WILLIAM C. BOND, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Motor-Cycles, of which the following is a specification.

The object of my said invention is to provide a two-speed friction drive for motor cycles of a comparatively simple yet effective and inexpensive construction, all as will be hereinafter more fully described and claimed.

Referring to the accompanying drawings which are made a part hereof and on which similar reference characters indicate similar parts, Figure 1 is a side elevation of a motor cycle equipped with my said invention, Fig. 2 a sectional view looking in the direction indicated by the arrows from the dotted line 2—2 in Fig. 1, Fig. 3 a detail sectional view of the lower end of the engine showing its connection with the frame and adjusting mechanism, Fig. 4 a detail section on the dotted line 4—4 in Fig. 3, and Fig. 5 a detail view showing a modified construction.

In said drawings the portions marked A represent the frame of the motor cycle, B the engine, and C a friction gear wheel for transmitting the power from said engine to the driving axle.

The frame A of the motor cycle is, or may be, of any common or approved construction, and needs no special description herein. The engine B is also any well-known, or approved, type of engine suitable for this purpose, that shown being of the type driven by an explosive. It is mounted on two parallel bars of the frame A by means of perforations in downwardly projecting lugs or ears B' cast on each side of the lower end of the engine casing. It is supported at its upper end by means of an upwardly extending arm B⁵ having an eye on its upper end adapted to slide upon the bar A' of the frame. The lugs or ears B' on the lower end of the engine being of suitable length, furnish a secure and steady support for the engine at its base and the connection at the top with the bar A' affords it a further support. It is thus adapted to slide longitudinally on the frame, and for this purpose is connected with a rod B² which extends through a perforation in a downwardly projecting ear b cast on the bottom of the

engine at a central point. Collars b' and b² are secured on said rod B² a short distance each side of said ear b and coiled springs b³ and b⁴ are interposed between said collars and each side of said ear, respectively. The forward end of said rod B² is hinged to a lever B³ fulcrumed on a pivot supported by collars a secured on the upwardly extending front bars of the frame. Said lever B³ has a spring latch b⁵ on its upper end adapted to be operated by a push button b⁶ mounted in a perforation in the upper end of said lever, said latch being adapted to engage with either one of a series of notches 1, 2, or 3 in a bar A⁴ secured on the frame, or the side of the tank carried by said frame, as shown.

The engine has the usual crank shaft 4 with a fly wheel 5 upon one outer end and a friction wheel 6 upon its other outer end. A gear wheel 7 is also mounted thereon and meshes with a gear wheel 8 on a cam shaft 9, which is mounted in suitable bearings parallel with said crank shaft and carries the cam 10 for operating the exhaust valve, and upon its outer end a friction wheel 11.

The friction wheel C is mounted upon a counter shaft 12 in suitable bearings on the frame parallel with the crank shaft 4 and upon its opposite end has a sprocket wheel 13 geared by a sprocket chain 14 to the sprocket wheel 15 on the driving axle of the motor cycle. Another sprocket wheel on said axle is connected by a sprocket chain 16 to a sprocket wheel 17 on the pedal-crank shaft 18.

It will be noted that the gear wheel 8 is of much larger diameter than the gear wheel 7 and that the friction wheel 6 is of larger diameter than the friction wheel 11. Said friction disk 11 is thus driven at much less speed than said friction disk 6. When it is desired to reduce the speed of the motor cycle or increase the driving power, lever B³ is thrown into the position shown in Fig. 1, which slides the engine back on the frame A and brings friction wheel 11 into contact with the outer face of a flange of the friction wheel C. Wheel 7 being of small diameter and driving upon wheel 8 of large diameter, and through the small friction wheel 11 driving connection being made with the large friction wheel C, it will be seen that great driving power can be obtained. When it is desired to increase the

speed of the motor cycle, latch b^5 of the lever B^3 is disengaged from notch 3 in the bar A^4 and the lever swung so that said latch will engage notch 1, sliding the engine forward on the frame A and driving the friction wheel 6 into contact with the inner face of the flange of the friction wheel C . The initial speed of the engine is thus applied directly, through large wheel 6, to drive the wheel C , which, being geared to the driving wheel of the motor cycle, enables a high speed to be obtained. In each adjustment the engine B is made to slide beyond the point where the wheels 6 and 11 contact with the flange of the wheel C , thus compressing somewhat either the springs b^3 or b^4 so that the frictional contact between the wheels 6 and 11, respectively, with the wheel C is always under a spring tension. This tension may be increased or diminished according to the needs of the occasion by adjusting the collars b^1 and b^2 , as may be required. When it is desired to throw the engine out of operation lever B^3 is adjusted so that the latch b^5 will engage notch 2, when the flange of wheel C will run between wheels 6 and 11 without contacting with either.

In Fig. 4 I have shown an engine of the two-cylinder type, and rigidly mounted, instead of slidably mounted, on the frame, and have shown the counter shaft 12, carrying the friction wheel C , mounted in bearings directly under the engine in line with the axis of the wheel 6, and also of the wheel 11. Said bearings are formed with a vertical slot s , as shown by dotted lines in Fig. 4, which permits the shaft 12 to be moved vertically therein. Said shaft is supported on the end of the horizontal arm b^8 of the lever B^3 , which is pivoted at its angle to the frame on a pivot b^9 . At the upper end said lever B^3 is formed with a spring latch of the same construction as above shown and described for the lever B^3 , which is adapted to engage with notches in a bar B^9 , suitably mounted on the frame. By throwing the lever from one notch to the other the shaft 12 carrying the wheel C may be thrown up or down and bring the rim of said wheel into contact with either the wheel 6 or the wheel 11, or stand midway between said wheels, as will be readily understood by an examination of the drawing.

Having thus fully described my said invention, what I claim as new and desire to secure by Letters Patent, is,

1. In a motor cycle drive, the combination, of a drive wheel, a crank-shaft, a cam shaft geared thereto, a friction wheel on its outer end, another friction wheel mounted on the outer end of said crank-shaft adjacent to the friction wheel on the cam shaft, a countershaft mounted in suitable bearings parallel with said crank-shaft and geared to said

drive wheel, a friction wheel mounted on said countershaft having a rim interposed between the friction wheels on the cam shaft and crank-shaft, and means for throwing one or the other of said friction wheels into contact with the rim of said wheel on said countershaft, substantially as set forth.

2. A motor cycle comprising a frame, a drive wheel, an engine slidably mounted on said frame, means for sliding and securing said engine, a crank-shaft, a cam shaft geared thereto, a friction wheel on the adjacent outer end of each of said shafts, a countershaft, gearing connecting said countershaft to the drive wheel, and a friction wheel on said countershaft provided with a rim extending between the wheels on said crank shaft and cam shaft, substantially as set forth.

3. In a motor cycle, the combination, of a frame, a drive wheel, an engine, a crank-shaft on the engine, a cam shaft geared thereto, friction wheels on the adjacent outer ends of said shafts, one being of larger diameter than the other, a friction wheel mounted with its rim between the adjacent faces of said friction wheels, gearing connecting said friction wheel with the drive wheel, and means for throwing one or the other of said friction wheels geared to the engine into contact with the friction wheel geared to said drive wheel, substantially as set forth.

4. A motor cycle, comprising a frame, a drive wheel, a motor having a crank shaft and a cam shaft on said frame, and gearing connecting said motor with the drive wheel comprising friction gears arranged to be driven interchangeably directly from the crank shaft or from the cam shaft, substantially as set forth.

5. In a motor cycle, the combination, of a frame, a drive wheel, a motor, a cam shaft, a countershaft geared to said drive wheel, and gearing connecting said motor with the drive wheel comprising friction gears, one of which is mounted directly on the motor shaft, one on said cam shaft, and a third on said countershaft, and means for connecting said third friction gear with either of the others, whereby the vehicle may be driven directly from the engine shaft or through the cam shaft, substantially as set forth.

6. In a motor cycle, the combination, of a frame, a drive wheel, a motor mounted to slide on said frame, two gear wheels carried by said motor adjacent to each other, a countershaft having a third gear wheel with its rim between said two gear wheels, gearing connecting said countershaft with the drive wheel, means for sliding said engine to contact either one or the other of said wheels carried thereon with the wheel on said countershaft, and a spring cushion interposed between the adjusting means and a part on

the engine for providing a spring tension between the contact surfaces of said gear wheels, substantially as set forth.

5 7. In a motor cycle, the combination, of a motor, a drive wheel, and gearing connecting said motor to said drive wheel comprising friction wheels one of which has a rim interposed between the adjacent faces of the other friction wheels which other friction
10 wheels are geared to be driven at different speeds, and means for sliding the motor on the frame to throw one or the other of said friction wheels into gear with the wheel connected to the drive wheel, substantially
15 as set forth.

8. In a motor cycle, the combination, of a motor, mechanism to be driven thereby, and

friction gear connecting said motor with said mechanism comprising friction wheels two of which are of different diameters and
20 arranged one on each side of the rim of the third, and means for throwing either one of said first mentioned wheels into contact with said rim of the third at will, substantially as
25 set forth.

In witness whereof, I have hereunto set my hand and seal at Washington, D. C. this 19th day of March, A. D. nineteen hundred and eight.

WILLIAM CHARD BOND. [L. S.]

Witnesses:

WILLIAM J. LA VARRE,
ALFRED B. DENT.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."