No. 675,458. Patented June 4, 1901.

E. Y. WHITE.

MOTOR BICYCLE.

(Application filed Nov. 8, 1900.)

(No Model.) 2 Sheets—Sheet 1.

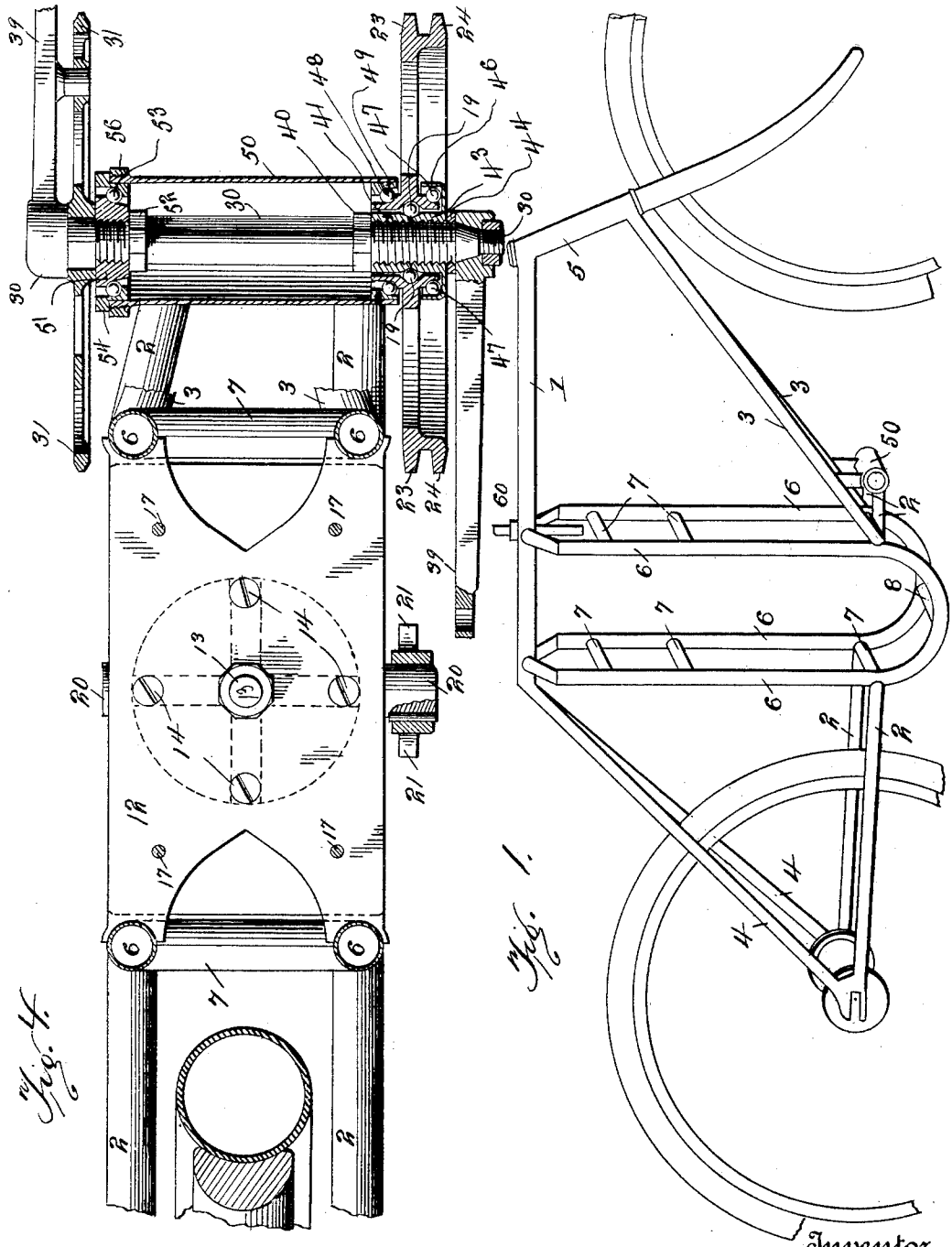


Fig. 4.

Fig. 1.

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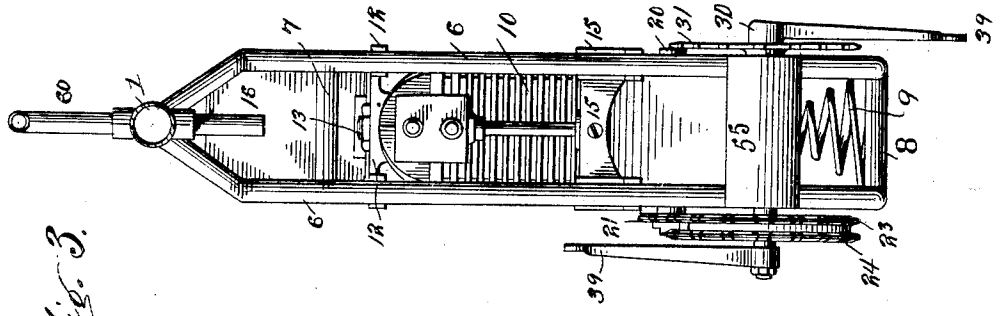


Fig. 3.

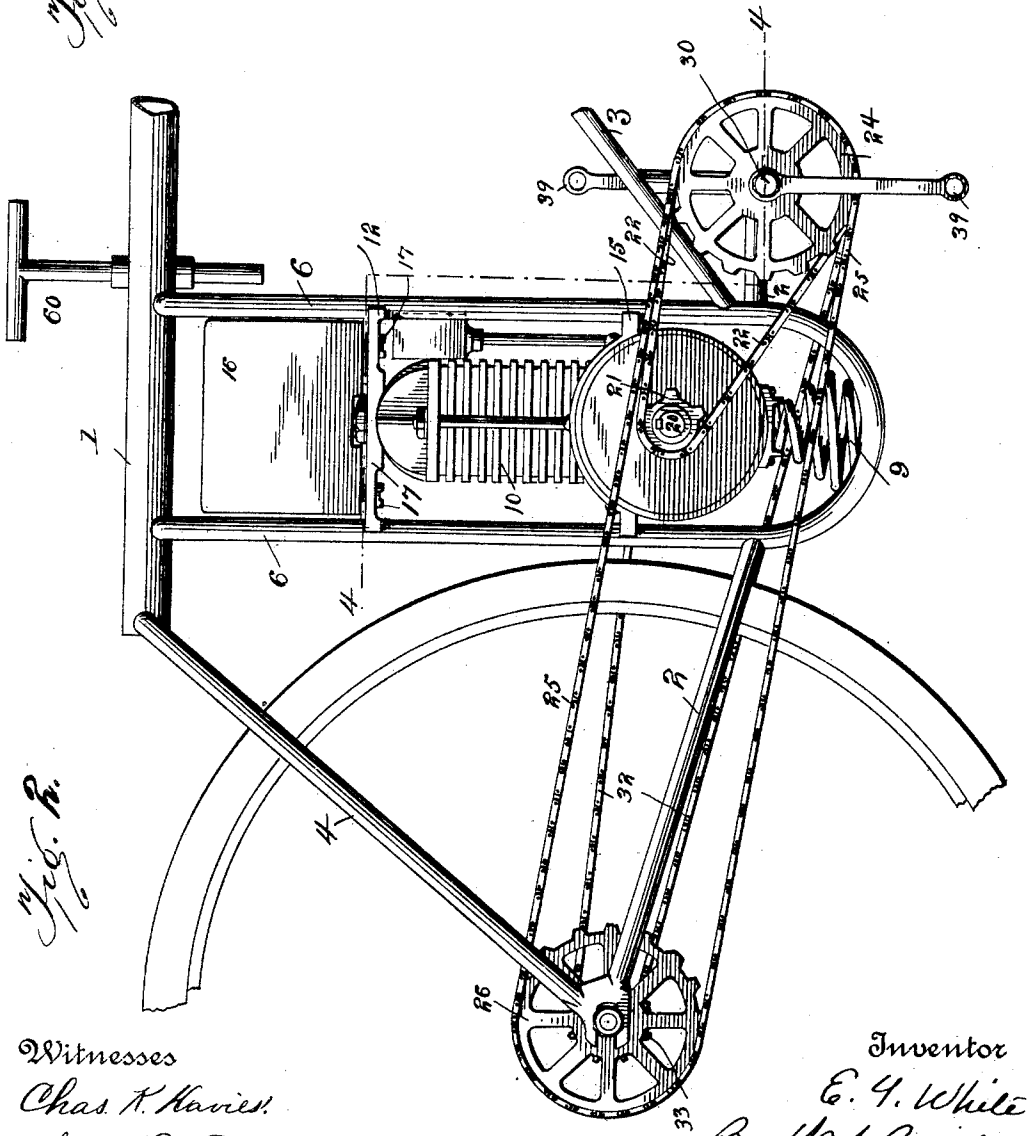


Fig. 2.

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UNITED STATES PATENT OFFICE.

EDWARD Y. WHITE, OF SAN ANTONIO, TEXAS.

MOTOR-BICYCLE.

SPECIFICATION forming part of Letters Patent No. 675,458, dated June 4, 1901.

Application filed November 8, 1900. Serial No. 35,858. (No model.)

To all whom it may concern:

Be it known that I, EDWARD Y. WHITE, residing at San Antonio, in the county of Bexar and State of Texas, have invented certain new and useful Improvements in Motor-Bicycles, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to motor-bicycles.

The object of the invention is to produce a frame in which the motor shall be firmly supported without undue strain on any part of the machine and in which the weight of the motor shall be as low as may be and to connect the motor to the driving-axle in such way that a pedal shall also be utilized for driving the machine with little interference from the motor and with a proper balance of friction and to improve certain details and combinations of the driving-gear, as will be hereinafter explained.

Figure 1 is a perspective view of the main parts of the frame, the wheels broken and driving-gear omitted. Fig. 2 is a broken side view of part of the frame with the motor and driving-pedal in position. Fig. 3 is an elevation of the gear mechanism of Fig. 2 looking from the front, being a cross-section of the machine just in front of the pedals. Fig. 4 is an enlarged section on the irregular line 4 4 of Fig. 2.

The frame of the machine is in general a modification of the well-known diamond frame having the top bar 1, lower frame-bars 2 2, front braces 3 3 and rear braces 4 4, and the front standard 5, all arranged about as shown clearly in Fig. 1. The motor-frame, cradle, or basket consists of two bars 6 6, each connected at top to bar 1 and extending outward from the top bar and dropping to form a loop. The two loops are braced by cross-bars 7 7 and are also connected to the lower frame-bars 2 2 and braces 3 3. A cross-bar 8 at the bottom of the cradle or basket serves to support the power-motor. The two bars 6 6 thus have two upright corner-posts at the angles of a rectangle, and the power-motor 10, inclosed between said corner-posts, has its weight supported on cross-bar 8, the spring 9 securing elasticity.

The power-motor 10 is of usual construction and is supported on a spring 9, which spring rests on the cross-bar 8. The upper part of the motor is held to a guide-plate 12 by bolts or screws 13 and 14. The plate 12 has its corners notched to partially surround the upright limbs 6 6 of the basket, and a second guide-plate 15, connected to the motor below the motor-cylinder, is similarly notched. Thus the motor is supported in its basket or cradle on the spring 9 and is free to rise and fall in the basket, being guided by the upright portions of bars 6 6. The gasolene-tank 16 may be connected to plate 12 by screws 17 or in any other suitable manner.

The shaft 20 of the motor carries a sprocket-wheel 21, and a sprocket-chain 22 leads from the said wheel 21 to a double or twin sprocket-wheel 23 24, which runs loosely on the pedal-shaft. The sprocket-wheel 23 24 is integral or so connected that both sprocket-sections run together, and the hub of this double sprocket is preferably supported on ball-bearings 19 on the pedal-axle, as will be explained. A chain 25 leads from the sprocket 24 to the driving-sprocket 26 on the rear wheel, so that when wheel 23 is driven from the motor its twin sprocket 24 will drive the sprocket-driver. The sprocket-chain 22 will yield enough to permit the slight rise and fall of the motor in the frame, and this yielding will remove undue strains from the frame and permit such elasticity as insures strength to the frame and comfort to the rider.

The pedal-shaft 30 is supported in suitable bearings in the frame. Said pedal-shaft has pedals 39 and a sprocket-wheel 31 attached thereto, and a sprocket-chain 32 extends from said wheel 31 to the driving-sprocket 33 on the rear driving-axle. The sprocket 33 may have any usual form of coaster or brake, so that the driving mechanism is under control of the pedals in the same manner as are bicycles of usual construction whenever the driving-motor is at rest, and in driving the bicycle by means of the pedals the chain 25 and sprocket-wheel 23 and 24 may run as idlers, so that there is little loss of power by reason of the extra set of driving-gears. As the pedal-shaft thus has driving sprocket-chains at each side of the frame, it is important that the driving-sprockets shall be supported on proper bearings at each end and in position to have the wear-bearings taken up

readily. To this end the pedal-shaft 30 carries a lock-nut 40 and the bearing-sleeve 41 engages a screw-thread on the shaft and can be brought to a seat against said nut 40. The outer end of sleeve 41 is beveled as a bearing for the balls 19 inside the hub of the twin sprocket. A sleeve 43, with reverse incline, forms the other side of the bearing, and lock-nut 44 serves to secure these bearing-sleeves 41 43 in place. Sleeve 43 has a flange 46, which incloses a set of balls 47, surrounding and bearing on an inclined seat on the hub of the twin sprocket-wheel 23 24. A second set of balls 48 surrounds the other end of the hub of the twin sprocket-wheel, and a sleeve 49 completes the bearing for the balls 48. The sleeve 49 is connected rigidly to the casing 50, which incloses shaft 30. The bearing-sleeve 51 is screwed on the shaft 30 and may rest against lock-nut 52. Sleeve 51 has an inner inclined bearing for the set of balls 53. The other bearing for these balls is in a sleeve 54, which fits closely into the axle casing or drum 50 and has a flange bearing against the end of said drum. A screw-collar 56 engages the outer end of drum 50 and may be pressed to bearing against the flange of sleeve 54. By turning collar 56 the drum 50 may be pressed endwise, thus tightening the bearings of both sets of balls outside of the hub of the twin sprocket-wheel 23 24, as well as the bearings of the balls 53, on which the pedal sprocket-wheel is mainly supported.

When the motor is in use, it drives the loose twin sprocket-wheel and thence the hub of the drive-wheel without propelling the pedals, the coaster gear or brake of the pedal-brake on the driving-hub permitting the pedals to rest without being driven. When it is desirable to apply the brake, the pedals can be driven so as to slip the sprocket-chain on the motor, or to reverse said motor, the sprocket-wheel 26 being connected by a clutch to permit back movement of the axle, as is common.

The saddle-post 60 may be connected to the top bar of the frame in any suitable manner. The engine being spring-supported below the pedal-support throws little strain on the frame and by its low position tends to secure stability to the machine when in motion.

What I claim is—

1. In a motor-bicycle, the frame having a drop basket or cradle connected to the top bar and extending below the lower frame-bar and a power-motor supported on a spring in the said cradle and guided to rise and fall therein.

2. In a motor-bicycle, the frame having a motor cradle or basket pendent from the top bar and connected to the lower frame-bars, said cradle having four uprights as described, the power-motor supported by a spring in said cradle, and guide-plates connected to the motor and engaging the upright bars of the cradle, substantially as described.

3. In a motor-bicycle, the combination with the frame, of a cradle connected to the upper bar thereof, a power-motor supported by a spring in said cradle and carrying a sprocket-wheel, a pedal-shaft carrying a loose twin sprocket-wheel, and a chain leading from the twin sprocket to the rear hub of the bicycle, all substantially as described.

4. In a motor-bicycle, the combination with the frame, a cradle therein, and a power-motor contained in said cradle, of a pedal-shaft supported in the frame and having a fixed sprocket and a loose-running twin sprocket thereon, a drive-chain from the motor to the loose sprocket and thence to the driving-hub, and a drive-chain from the fixed sprocket to the driving-hub, substantially as described.

5. In a motor-bicycle, the frame having a basket or cradle as described extending from its top bar below the lower bars of the frame proper a power-motor in said basket or cradle, a pedal-shaft supported in the frame and carrying a driving sprocket-wheel at one side of the frame and supporting a loose twin sprocket at the other side, a driving-chain connected from the said sprocket to the driving-hub at each side, and a driving-chain extending from the motor to the twin sprocket, all combined substantially as described.

6. In a motor-bicycle, a basket or cradle for the motor-engine extending below the frame-bars proper, a spring supporting the motor-engine in said cradle, guides for said engine bearing on vertical bars of the cradle, and driving mechanism connecting said motor to the driving-hub, all combined substantially as described.

7. In a motor-bicycle as described, the frame having a cradle and the motor-engine contained therein, the pedal-shaft having sprocket-wheels at each side of the frame, and sprocket-chains at each side of the pedal-shaft and connected to the driving-hub, and means for adjusting the bearings of both sprocket-wheels on the pedal-shaft simultaneously, all combined substantially as described.

8. In a motor-bicycle, the frame having a top bar, a pendent cradle consisting essentially of a bar at each side of said cradle and forming a loop at the bottom, connections from said cradle to the lower bars of the frame, and a motor-engine inclosed in said cradle and suitably connected to the driving-gears, all combined substantially as described.

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

EDWARD Y. WHITE.

Witnesses:
W. A. HADDEN,
M. W. DAVIS.