

(No Model.)

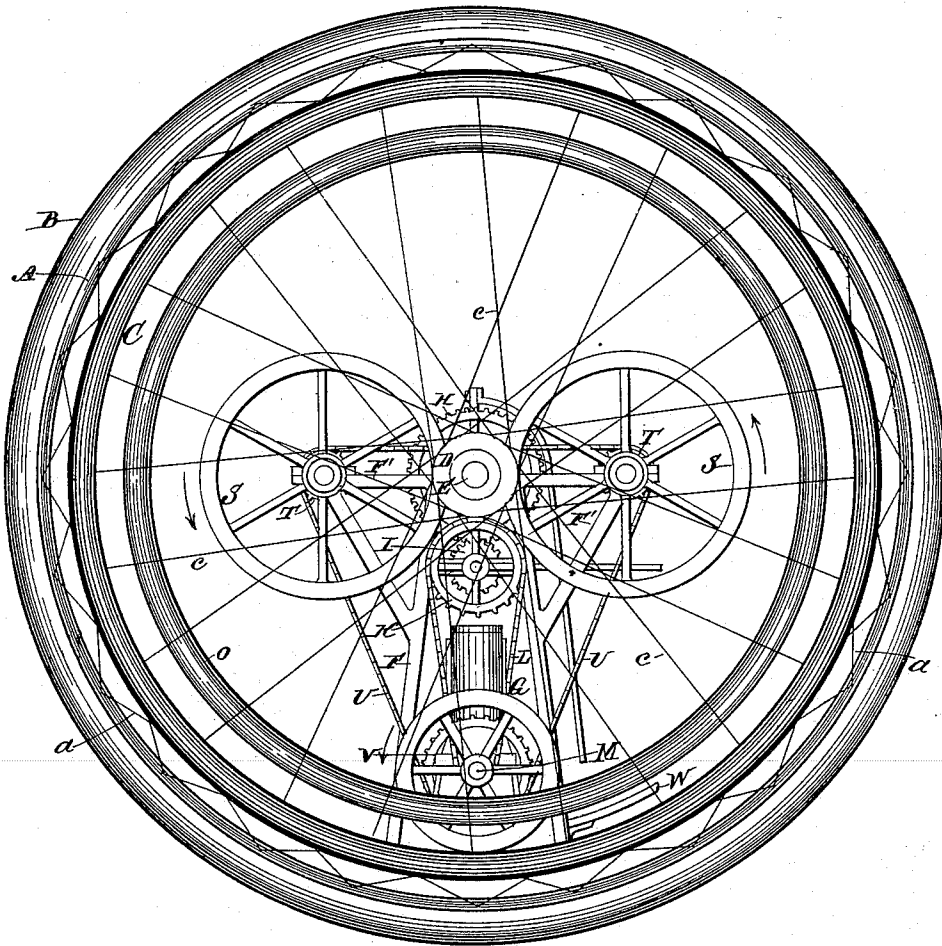
3 Sheets—Sheet 1.

E. J. CHRISTIE.
UNICYCLE.

No. 596,480.

Patented Jan. 4, 1898.

Fig. 1.



Attest.

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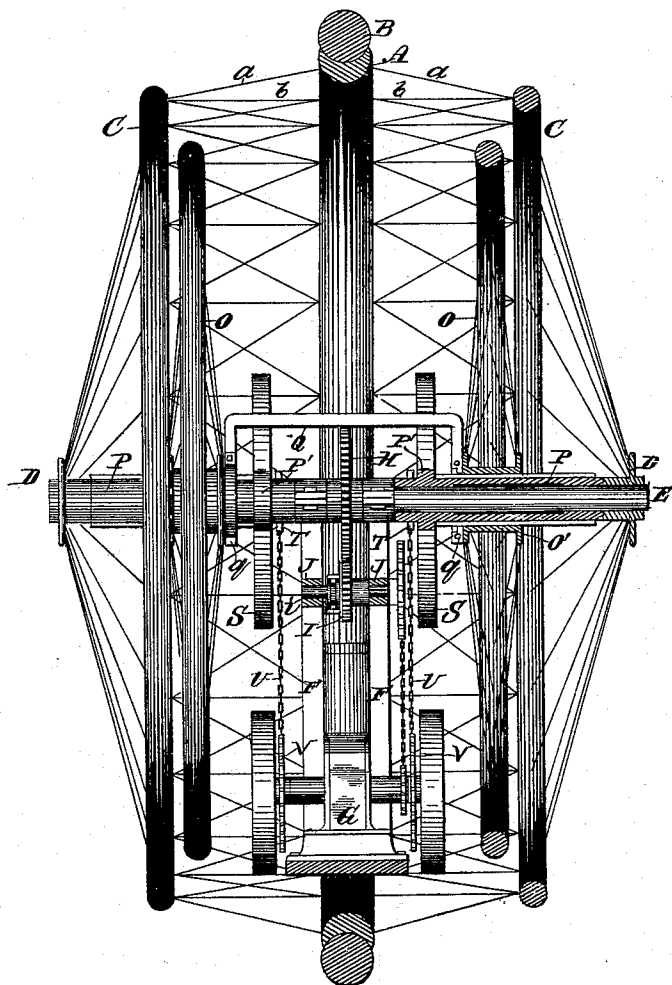
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Fig. 2.



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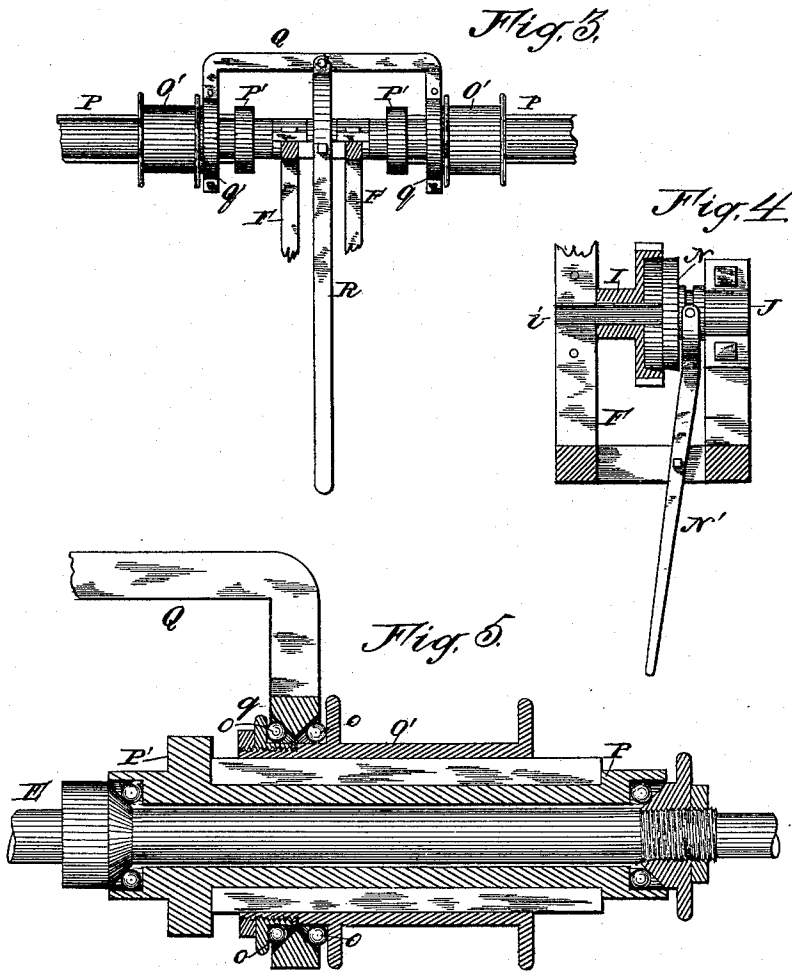
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UNITED STATES PATENT OFFICE.

ELZA J. CHRISTIE, OF MARION, IOWA.

UNICYCLE.

SPECIFICATION forming part of Letters Patent No. 596,480, dated January 4, 1898.

Application filed September 26, 1896. Serial No. 607,014. (No model.)

To all whom it may concern:

Be it known that I, ELZA J. CHRISTIE, a citizen of the United States, residing at Marion, in the county of Linn and State of Iowa, have
5 invented certain new and useful Improvements in Unicycles; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable
10 others skilled in the art to which it appertains to make and use the same.

The object of this invention is to produce a unicycle capable of automatic action both in propulsion and balancing and adapted to
15 travel on a single narrow rim.

The invention is embodied in a device hereinafter fully described and claimed, reference being had to the accompanying drawings, in
20 which—

Figure 1 is a side elevation of my improved
25 unicycle. Fig. 2, Sheet 2, is a front or rear elevation of the same, partly in central vertical section, the better to show the operative parts. Fig. 3, Sheet 3, is a fragmentary
30 elevation showing the shifting mechanism for the balance-wheels and from the side opposite to that shown in Fig. 2. Fig. 4 is a plan
35 view, partly sectional, of a clutch and its operating mechanism for throwing the main-wheel shaft into gear with the motor. Fig. 5
40 is a central longitudinal section of one of the balance-wheel hubs, sleeve and main axle, and the hub-shifter, showing an adaptation of ball-bearings to the parts.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, A is a large ring or felly provided with a suitable tire B. Each
45 side of this and at a considerable distance from it is a wheel C, the spokes *c c* of which connect diagonally with a hub D, secured at
50 the outer ends of a shaft or axle E. The rims of the wheels C C are connected with the rim A by truss rods or wires *a* and *b*, the construction being somewhat analogous to that employed generally in bicycle-wheels. A hollow wheel is thus provided to receive
55 the operative parts, which are all mounted on or suspended from its central axle. From the middle of the axle is hung a frame F, having a suitable base to support a motor G, which may be of any desired type, a gasoline-engine being illustrated ideally in the

drawings. This motor communicates motion to the axle E and the main wheel fast thereon through a suitable train of gearing. These
55 may be such as utility or economy may suggest, a simple device of chain-and-spur gearing being illustrated. The main driving-gear H is secured to the axle E and meshes with a pinion I on a shaft *i*, mounted in suitable
60 bearings J J in the frame. To one end of the shaft is secured a sprocket-wheel K, which connects by chain belt L with a sprocket M on the motor-shaft.

Provision is made for running the motor
65 without propelling the main wheel by the use of a clutch N of a simple and well-known construction. The clutch illustrated in Fig. 4 is a friction-clutch, and thus better adapted to the easy and gradual starting of the main
70 wheel than a shouldered or ratchet clutch would be. The clutch is operated by a suitable hand-lever N'. The main wheel is balanced and kept in an upright position by a pair of rapidly-revolving wheels O O on the
75 familiar principle of the gyroscope, and for convenience these may be called the "balance-wheels" of the apparatus. Two are used, not because one would not produce substantially
80 the same effects, but because a pair may be more conveniently applied to the unicycle, one each side of the motor, than to mount a single one with its actuating mechanism in the middle, where it would be necessary to
85 mount it in order to properly preserve the balance of the unicycle. These wheels are mounted on splined sleeves P P, revolving freely on the axle E, and their hubs connect
90 revolubly with a shifter Q, connecting with a suitable lever R. In the preferred construction shown in Fig. 5 the rings *q q* of the shifter are doubly beveled and travel between two sets of balls *o o* in suitable ball-races at one end of each of the hubs O' O'. Ball-bearings are also preferred for the sleeves P P, as
95 shown in the same figure, the construction being so simple and well known as to require no description. This admits of a rapid revolution of the balance-wheels with very little friction and the expenditure of comparatively
100 little power. Motion is imparted to the sleeves P P preferably by friction-wheels S S, fixed to shafts journaled in bearings on arms F' F' of the frame F. The peripheries

of these wheels bear on the peripheries of hubs P' P' of the sleeves. Sprockets TT are secured to the shafts adjacent the friction-wheels SS, and motion is transmitted to them
 5 through chain belts U from sprockets V V on the motor-shaft. The front side of the wheel is determined solely by the direction in which the motor revolves. With the movement as indicated in Fig. 1 the right-hand side of the
 10 wheel is the front side.

For practical use the machine should be large enough so that the operator may ride inside the main wheel and govern its movements, a suitable platform W being provided
 15 for him to stand on.

In the operation of the machine a rapid motion is imparted to the balance-wheels by the motor disconnected from the main axle, the clutch N being open. The effect of this
 20 is to maintain an upright position to the main wheel. By closing the clutch N the wheel is propelled forward.

The unicycle is easily guided by shifting the balance-wheels on their sleeves by means
 25 of the lever R. Assuming that Fig. 2 is seen from the rear, a movement of the gyroscope-wheels to the right on their sleeves will turn the cycle to the right, and vice versa. The effect of this construction is to give to a unicycle operated by a motor the stability of a
 30 road-wagon, with the convenience in traveling along a narrow path and turning short corners possessed by an ordinary bicycle.

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

1. In a unicycle, the combination with a main wheel and axle, of motive power suspended from its axle, a pair of wheels revoluble on said axle inside the main wheel, and gearing connecting the motive power there-
 40 with.

2. In a unicycle, the combination with the main wheel and its axle and motive power suspended therefrom, of a pair of wheels of large diameter mounted revolubly on said axle inside the main wheel and each side of the middle, and suitable gearing adapted to impart rapid rotation to said internal wheels, sub-
 45 stantially as and for the purpose set forth.

3. In a unicycle, the combination with the

main wheel and its axle and a suitable motor suspended therefrom, of a pair of large wheels mounted revolubly on the axle inside the main wheel, suitable gearing to impart rapid rotation to them, and means substantially as described for shifting them sidewise on the axle, to change the course of the main wheel.
 55

4. In a unicycle, the combination with the main wheel and its axle, of a motor suspended from said axle inside said wheel, a pair of gyroscope-wheels mounted revolubly on said axle, gearing connecting them and the motor and adapted to give them a rapid rotation, and gearing connecting said motor with said axle and adapted to impart a comparatively slow rotation to the said axle, substantially as and for the purpose set forth.
 60 65

5. In a unicycle, the combination with the main wheel and its axle, of a motor suspended from the axle inside the main wheel, a pair of gyroscope-wheels mounted revolubly on the axle adjacent to said motor, suitable gearing to transmit rapid rotation to them, gearing adapted to transmit a slower rotation to the
 70 main axle, and a clutch to throw the latter train of gearing in and out at will.

6. In a unicycle, the combination with the main wheel and its axle, with suitable motor mechanism suspended therefrom, of a balance-wheel mounted on a splined sleeve revoluble on the main axle, and a shifter connected revolubly with the hub of the balance-wheel, whereby it may be shifted sidewise while in rapid rotation, substantially as and
 85 for the purpose set forth.

7. In a unicycle, the combination with the main wheel, its axle, and internally-suspended motor mechanism, substantially as described, of friction-wheels receiving motion from said motor, sleeves on the main axle having hubs in peripheral contact with said friction-wheels, and provided with suitable splines, and balance-wheels mounted on said splined sleeves and shifting mechanism, substantially
 90 as and for the purpose set forth.

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

ELZA J. CHRISTIE.

Witnesses:

J. M. ST. JOHN,
 J. F. GROAT.