

No. 647,196.

Patented Apr. 10, 1900.

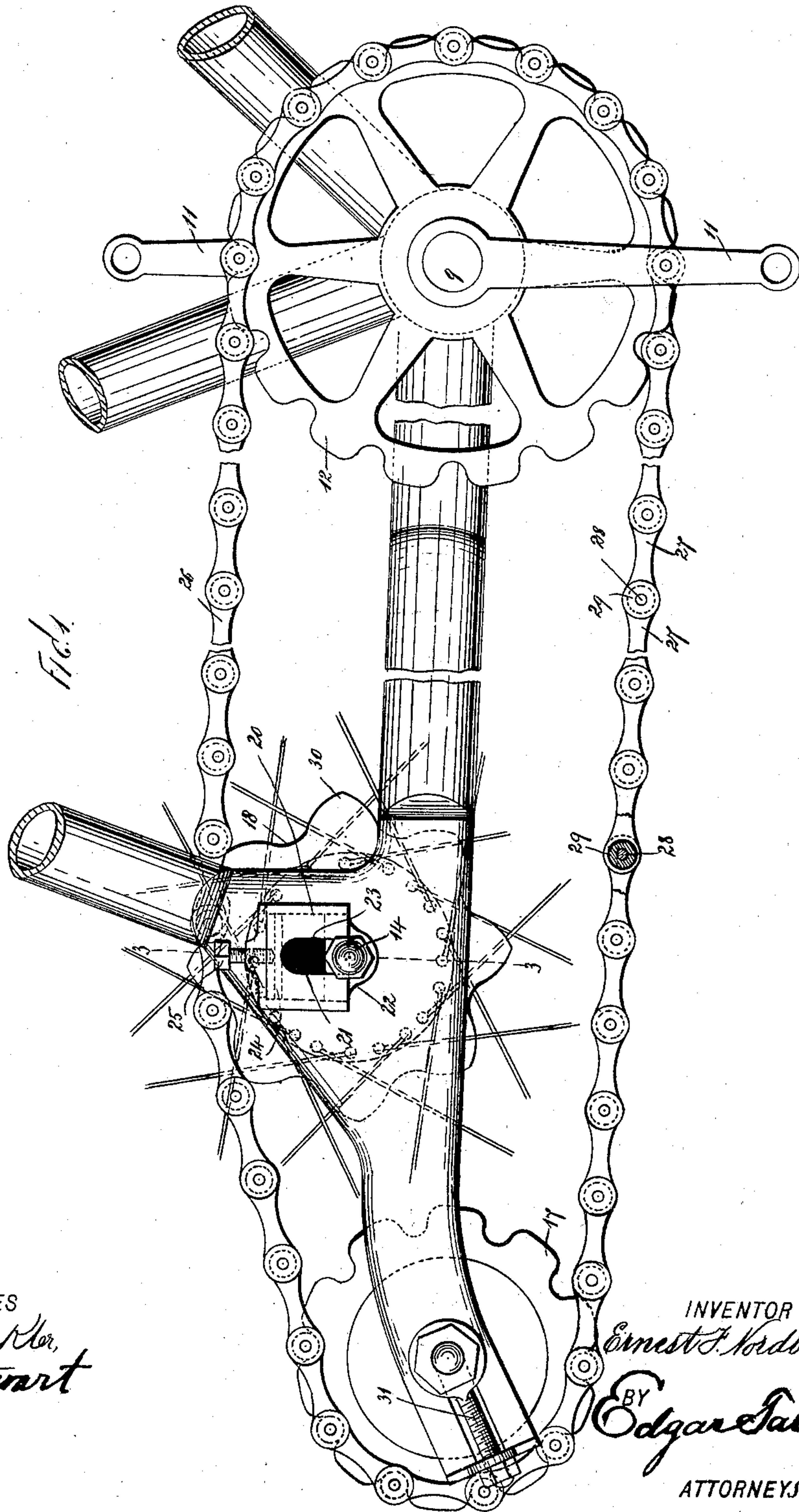
E. F. NORDBLOM.

PROPELLING MECHANISM FOR BICYCLES, &c.

(Application filed May 6, 1899.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES

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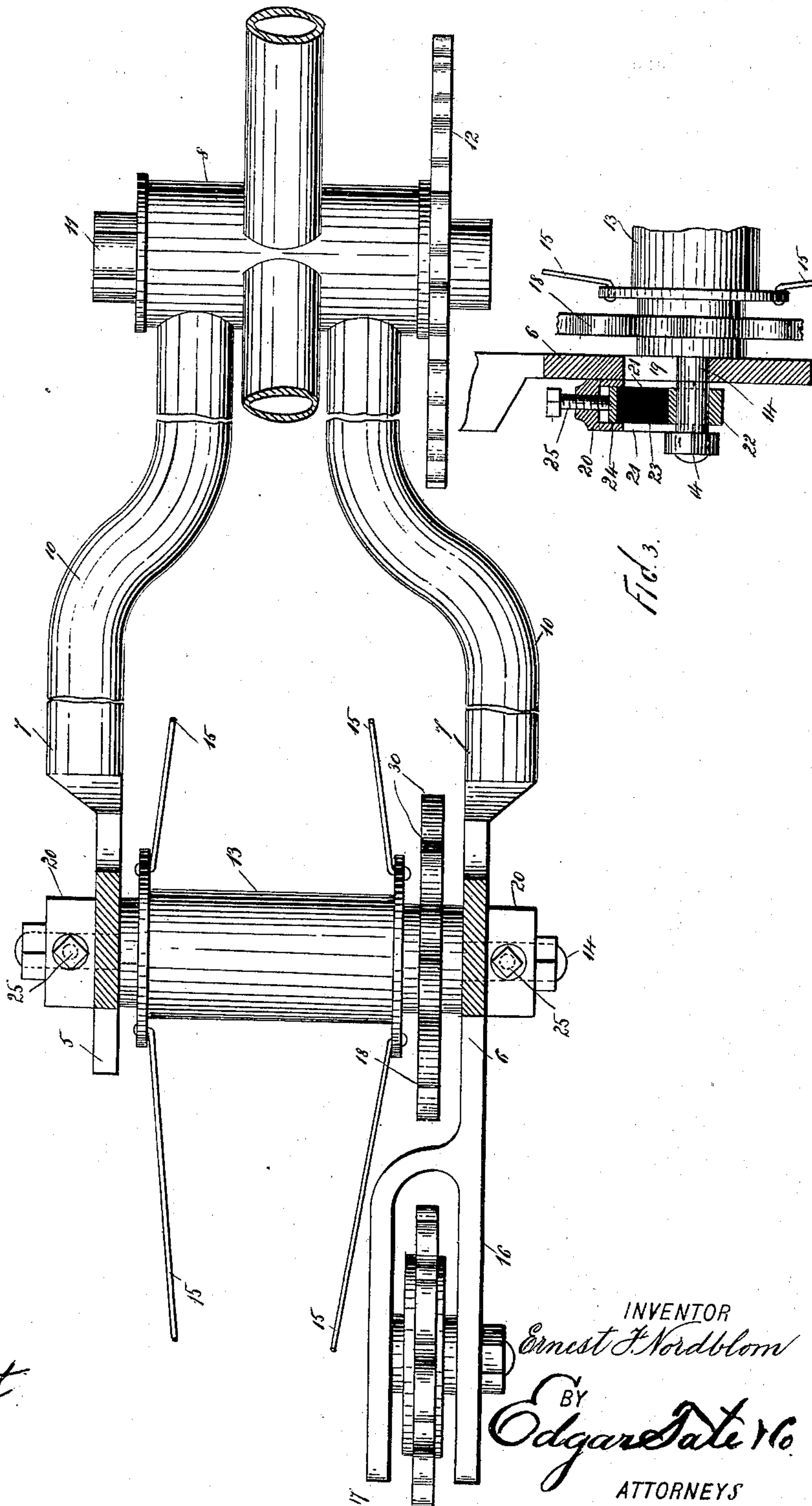
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UNITED STATES PATENT OFFICE.

ERNEST FREDRICK NORDBLOM, OF PEARL RIVER, NEW YORK.

PROPELLING MECHANISM FOR BICYCLES, &c.

SPECIFICATION forming part of Letters Patent No. 647,196, dated April 10, 1900.

Application filed May 6, 1899. Serial No. 715,834. (No model.)

To all whom it may concern:

Be it known that I, ERNEST FREDRICK NORDBLOM, a citizen of the United States, residing at Pearl River, in the county of Rockland and State of New York, have invented certain new and useful Improvements in Propelling Mechanism for Bicycles and Similar Vehicles, of which the following is a full and complete specification, such as will enable those skilled in the art to which it appertains to make and use the same.

This invention relates to the propelling mechanism of bicycles and similar vehicles; and the objects thereof are to provide an improved propelling mechanism for vehicles of this class whereby the weight of the rider on the vehicle operates to tighten the chain and take up the slack thereof and whereby greater speed will be attained; and with these and other objects in view the invention consists in the construction, combination, and arrangement of parts hereinafter described and claimed.

The invention is fully disclosed in the following specification, of which the accompanying drawings form a part, in which—

Figure 1 is a side view of my improved propelling mechanism. Fig. 2 is a plan view thereof, and Fig. 3 a section on the line 3 3 of Fig. 1.

In the drawings forming part of this specification the separate parts of my improvement are designated by the same numerals of reference in each of the views, and in said drawings I have shown my improvement applied to the frame of an ordinary bicycle, and in the practice of my invention, as shown in the drawings, the drive-wheel of the vehicle is mounted between backwardly-directed extensions 5 and 6, formed on or secured to the horizontal rods 7, which are rigidly connected with the hub 8, through which the pedal-shaft 9 passes, and the ends 7 are, in my improvement, curved outwardly at 10, so as to accommodate the arrangement of the sprocket-wheels which I employ.

The pedal-shaft is provided with the usual pedal-cranks 11 and with a sprocket-wheel 12, and the hub 13 of the drive-wheel of the vehicle is provided with the usual shaft 14, which passes through the backwardly-directed extensions 5 and 6 of the side rods 7.

The backwardly-directed extension 6 at one side of the drive-wheel, the spokes of which are shown at 15, is provided with a backwardly-directed yoke-shaped holder 16, in which is mounted a sprocket-wheel 17, and a sprocket-wheel 18 is mounted on the hub 13 of the drive-wheel within the backwardly-directed extension 16 of the corresponding frame-rod 7, and the sprocket-wheels 12, 17, and 18 are in the same vertical plane, as clearly shown in Fig. 2.

The parts or members 5 and 6 of the frame through which the shaft of the drive-wheel passes are provided with vertical slots or openings 19, but one of which is shown, and secured to the outer side of said parts or members in any desired manner or formed integrally therewith is a box or keeper 20, having corresponding slots or openings 21 in the outer and inner sides thereof, and these slots or openings are preferably so formed as to open downwardly, and the shaft or axle 14 of the drive-wheel passes therethrough, and mounted in said boxes or keepers and vertically movable therein is a bearing 22, through which said shaft or axle also passes, and above which is placed a compressible spring-bearing 23, preferably a rubber cushion, above which is placed a movable plate 24, and passing through the top of the boxes or keepers 20 are set-screws 25, which bear upon plates 24 and by which the position of said plates may be regulated.

From the foregoing construction it will be seen that the weight of the rear end of the frame of the vehicle rests upon the shaft of the drive-wheel, and the said frame is vertically movable, the movement thereof depending upon the elasticity of the rubber bearing 23. I also employ a chain 26 of the form shown in Fig. 1, said drive-chain being composed of separate links 27, which are connected by transverse pins 28, on each of which is mounted a roller 29.

The sprocket-wheels 12 and 17 are of the usual or any preferred form and construction; but the sprocket-wheel 18 on the hub of the drive-wheel is of novel construction and, as shown, has eight teeth and is greater in diameter than a sprocket-wheel having eight teeth of the same form as the teeth on the sprocket-wheels 12 and 17 would be. The

teeth of the sprocket-wheel 18 are also of novel form, the sides thereof being substantially of the form of an ogee curve, said curve being the curve described by the movement of the chain over the wheel in the operation thereof, and the height of the teeth is determined by the distance between the centers of the rollers of the drive-chain. By forming the teeth in this manner I prevent what is known as "backlash" of the chain, and by reason of this construction of the teeth 30 of the sprocket-wheel 18 the said chain is always in full connection with one tooth and in partial connection with another, and the leverage of the wheel 18 is also largely increased over that of a smaller wheel, having eight teeth similar to the teeth on the wheels 12 and 17. It will be apparent, however, that the teeth on the wheel 18 may be increased or decreased in number, all that is necessary being to form the teeth in the manner herein described. It will be apparent, however, that slight changes in the form of the teeth 30 of the sprocket-wheel 18 may be made without materially altering the operation of the apparatus.

As shown in the drawings, the teeth of the sprocket-wheel 18 are also less in number than the teeth on the sprocket-wheel 17, and the teeth on the sprocket-wheel 17 are of the same form, but less in number, than those on the sprocket-wheel 12 on the pedal-shaft; but the size of these wheels and the number of teeth thereon may be increased or decreased as desired, it being understood that the speed of the vehicle is controlled by the size of the sprocket-wheels 18 and 12 and the number of teeth thereon. The teeth of the wheel 18 being farther apart than the links of the chain and their chain-engaging surfaces being of ogee form, they are enabled to travel faster than the chain, as the links pass slidably over the curved surfaces of the teeth on the principle of the cam, forcing the sprocket-wheel faster than the chain. By this means a greater speed is produced than by the use of the ordinary sprocket-wheel of the same pitch.

Although the seat on which the operator sits is not shown it will be understood that said seat is at the top of the frame, substantially over or slightly in front of the support of the drive-wheel of the vehicle, and by reason of the herein-described supports of the shaft or axle of said drive-wheel the weight of the rider, together with the weight of the rear end of the frame of the vehicle, as hereinbefore described, is supported by the spring-bearings 23, and the jolt or jar resulting from the passage of the vehicle over rough roads is thus largely obviated, while at the same time the vertical movement of the shaft or axle of the drive-wheel occasioned by the weight of the rider depressing the frame of the vehicle operates to raise the sprocket-wheel 18 and tighten the drive-chain 26 when the vehicle is in motion. This not only causes the drive-chain to operate with greater effectiveness,

but also facilitates the operation of the sprocket-wheel 18 in connection therewith.

I have also shown at 31 in Fig. 1 an ordinary drive-chain tension-regulating device, which is connected with the yoke-shaped holder 16, in which the sprocket-wheel 17 is mounted, and by means of this device the position of the said sprocket-wheel may be regulated when desired, as may also the tension of the drive-chain 26.

My improved propelling mechanism is simple in construction and operation and well adapted to accomplish the result for which it is intended, and it will be apparent that changes in and modifications of the construction herein described may be made without departing from the spirit of my invention or sacrificing its advantages.

Having fully described my invention, I claim as new and desire to secure by Letters Patent—

1. A bicycle or similar vehicle provided with a drive-wheel the shaft or axle of which is mounted in spring-depressed bearings by which the frame of the vehicle is supported, the hub of said drive-wheel being also provided with a sprocket-wheel, another sprocket-wheel mounted rearwardly of the drive-wheel of the vehicle, a sprocket-wheel on the pedal-shaft, and a drive-chain mounted on said sprocket-wheels, substantially as shown and described.

2. A bicycle or similar vehicle, the frame of which is provided with vertically-movable spring-depressed bearings for the shaft or axle of the drive-wheel, a sprocket-wheel supported rearwardly of said drive-wheel, a sprocket-wheel on the pedal-shaft, and a sprocket-wheel on the hub of the drive-wheel, said wheels being all in the same vertical plane, substantially as shown and described.

3. A bicycle or similar vehicle provided with the usual pedal-shaft, a sprocket-wheel mounted thereon, the side of the frame of the vehicle on which the pedal-shaft sprocket-wheel is located, being provided with a backwardly-directed support, a sprocket-wheel mounted therein, said frame of the vehicle being also provided with vertically-movable spring-depressed bearings through which the shaft or axle of the drive-wheel passes, and a sprocket-wheel mounted on the hub of the drive-wheel in line with said first-named sprocket-wheels, substantially as shown and described.

4. A bicycle or similar vehicle the frame of which at one side is provided with a backwardly-directed extension, a sprocket-wheel mounted therein, a sprocket-wheel mounted on the pedal-shaft, vertically-movable spring-depressed bearings through which the shaft or axle of the drive-wheel passes, and a sprocket-wheel mounted on the hub of the drive-wheel in line with said first-named sprocket-wheels, substantially as shown and described.

5. In a propelling mechanism of the class described, a drive-chain having a sprocket-

5 wheel provided with teeth, the spaces between the points of which are much greater than the lengths of the links of the chain and the sides of said teeth being of ogee form, substantially as shown and described.

10 6. In a propelling mechanism of the class described, a drive-chain having a sprocket-wheel provided with teeth, the spaces between the points of which are much greater than the lengths of the links of the chain, the sides of the teeth of said wheel being of ogee form, substantially as shown and described.

15 7. A bicycle or similar vehicle provided with the usual drive-wheel, the shaft or axle of which is mounted in spring-depressed bearings by which the frame of the vehicle is supported, the hub of the drive-wheel being also provided at one side with a sprocket-wheel, the teeth of which are farther apart than the 20 links of the chain and the chain-engaging surfaces of which teeth are of ogee form, another sprocket-wheel supported rearwardly

of the said end of the shaft or axle of the drive-wheel and a sprocket-wheel on the pedal-shaft, substantially as shown and described. 25

8. A bicycle or similar vehicle, the frame of which is provided with slots and vertically-movable spring-depressed bearings for the shaft or axle of the drive-wheel of the vehicle, a sprocket-wheel mounted on the hub of the drive-wheel, another sprocket-wheel supported rearwardly thereof, a sprocket-wheel on the pedal-shaft and a drive-chain mounted on said wheels, substantially as shown and described. 30 35

In testimony that I claim the foregoing as my invention I have signed my name, in presence of the subscribing witnesses, this 5th day of May, 1899.

ERNEST FREDRICK NORDELOM.

Witnesses:

HENRY A. GAUBERT,
RAYMOND JAS. BLAKESLEE.