

(No Model.)

T. M. CREPAR & H. HUNTER.  
DRIVING GEAR.

No. 540,208.

Patented May 28, 1895.

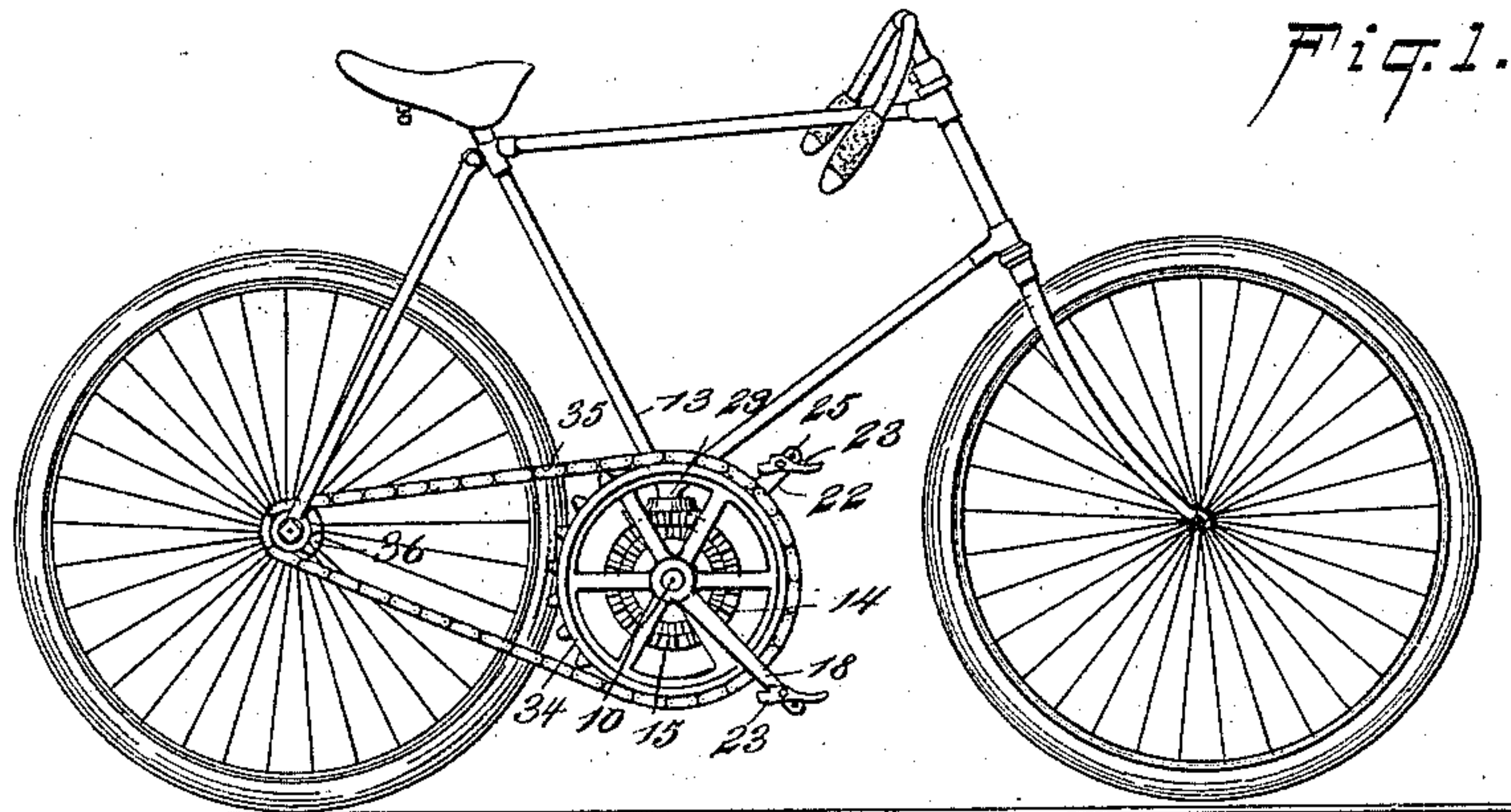


Fig. 1.

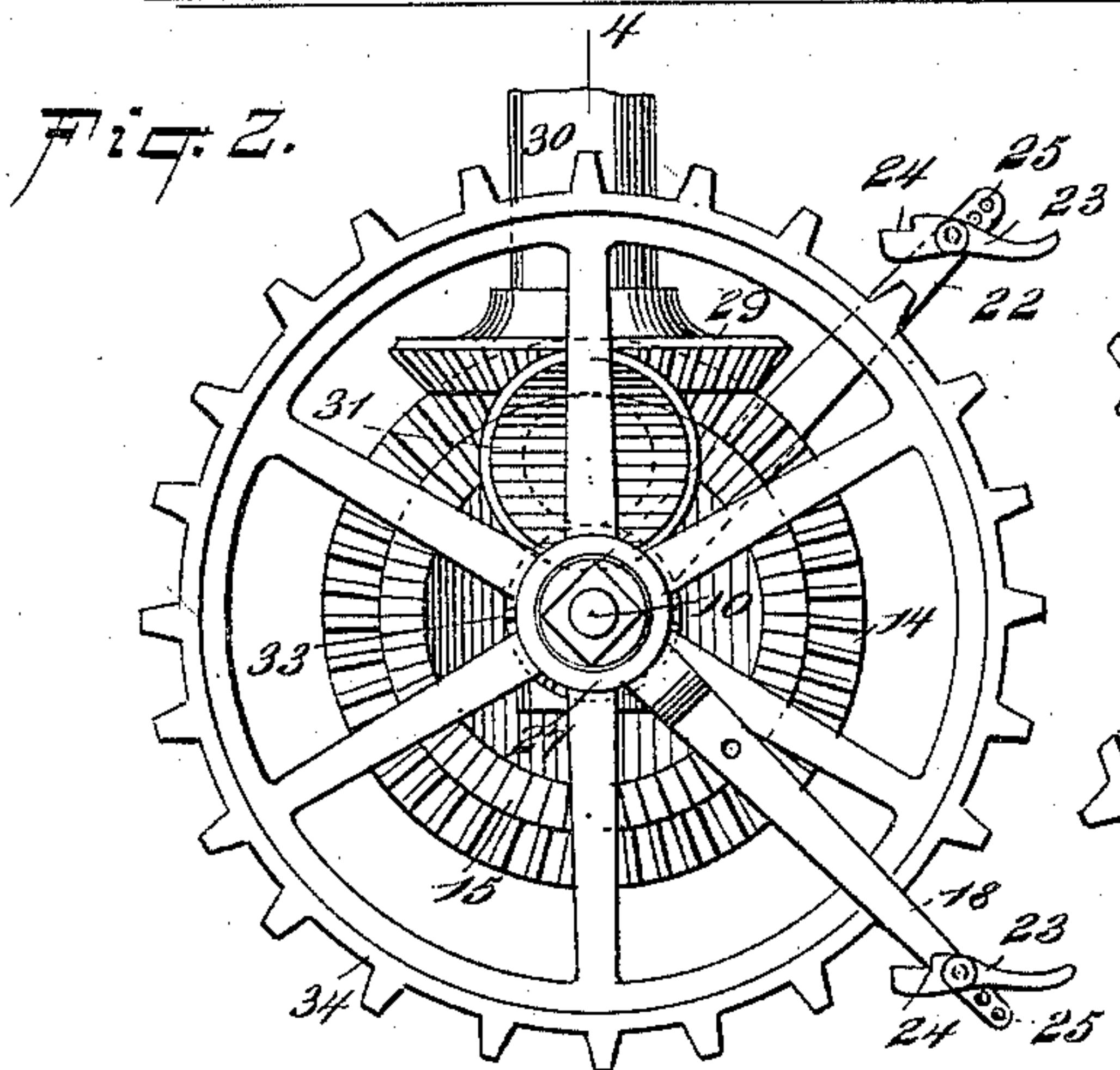


Fig. 2.

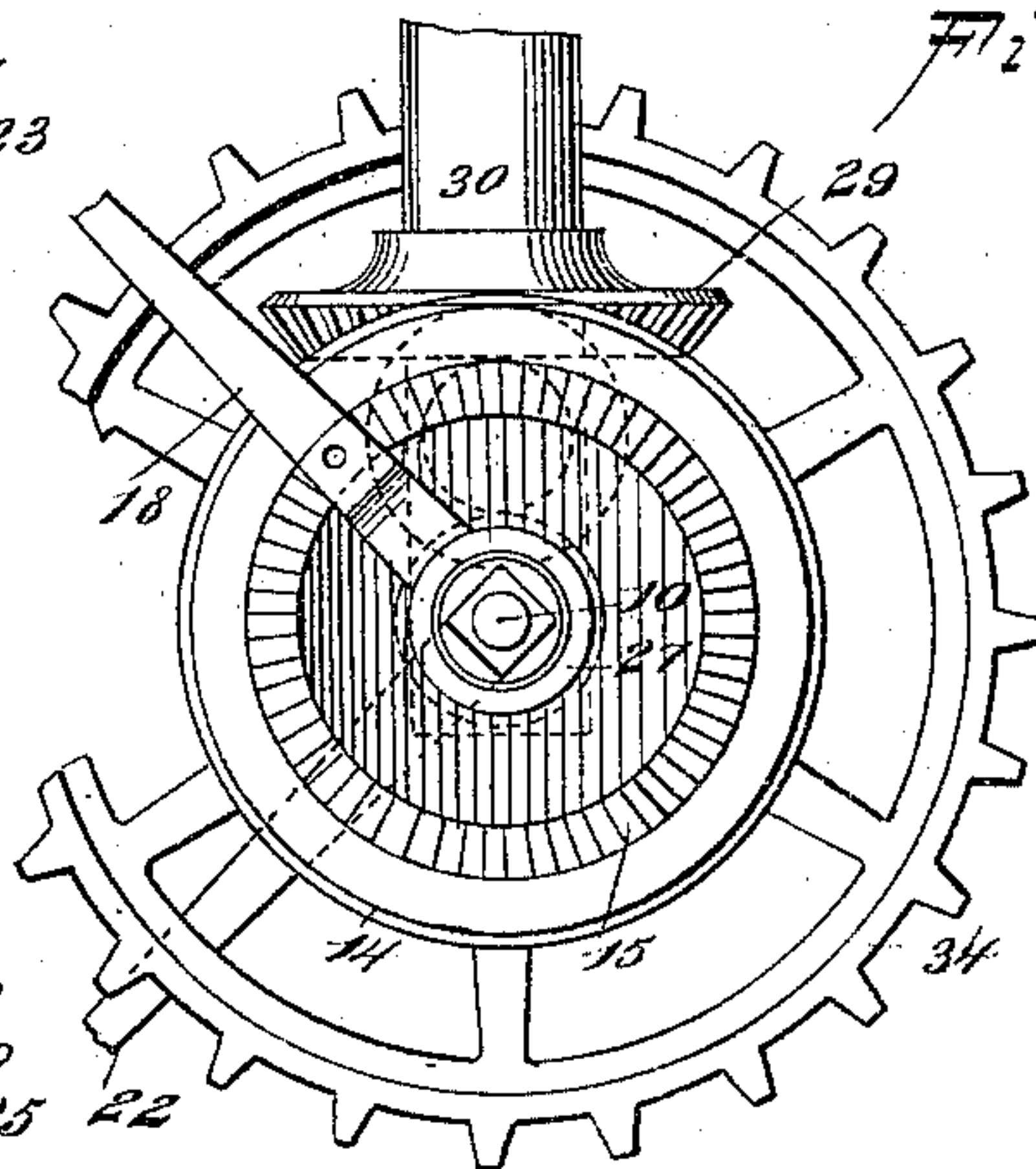


Fig. 3.

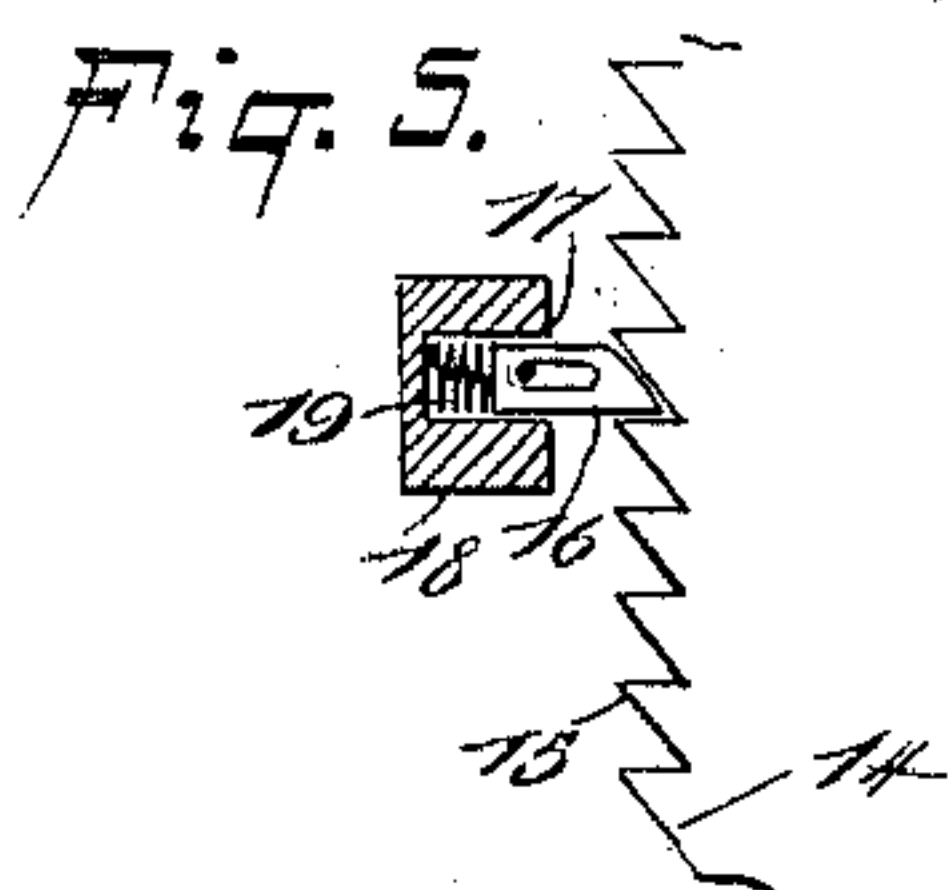


Fig. 5.

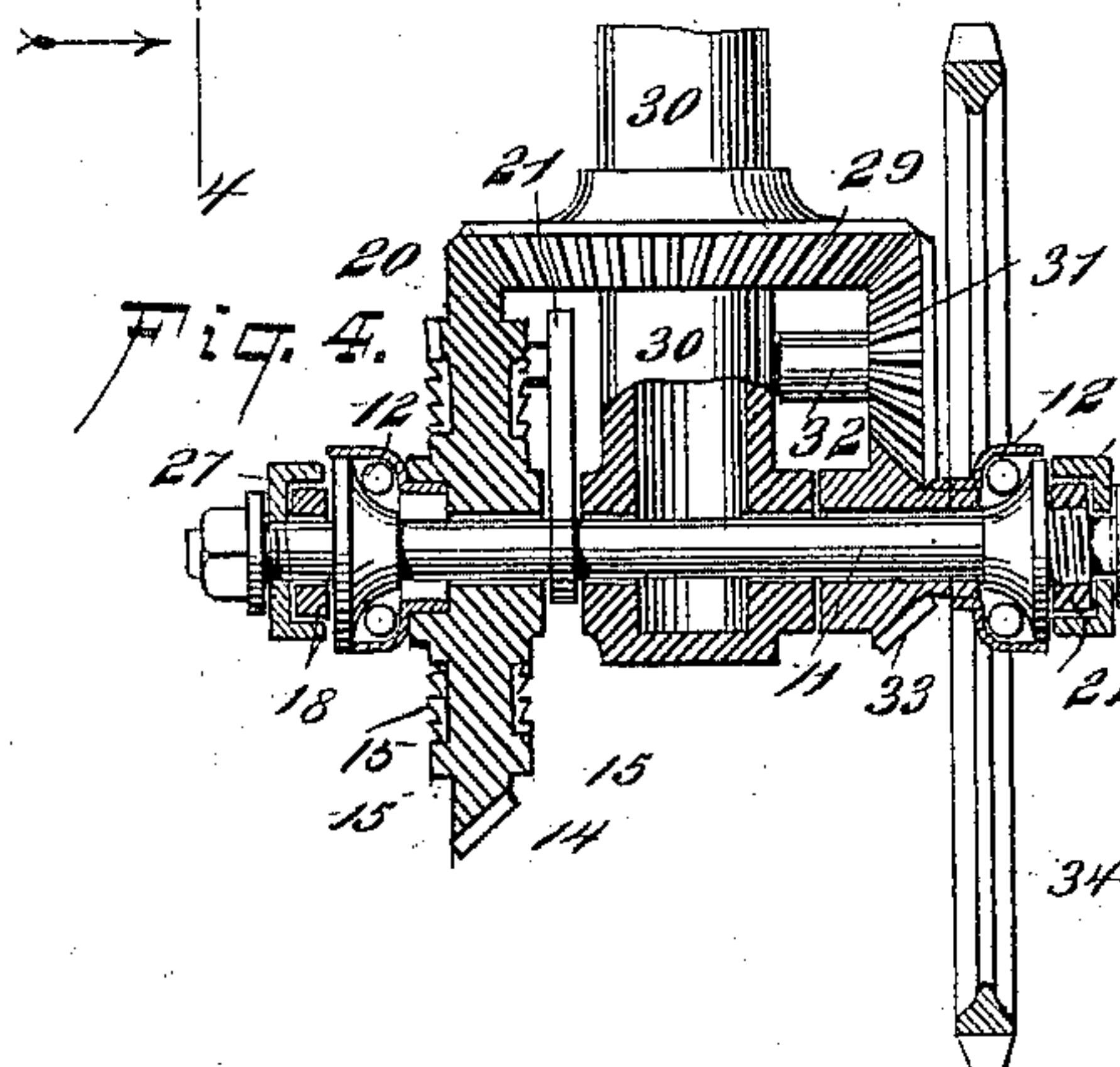


Fig. 4.

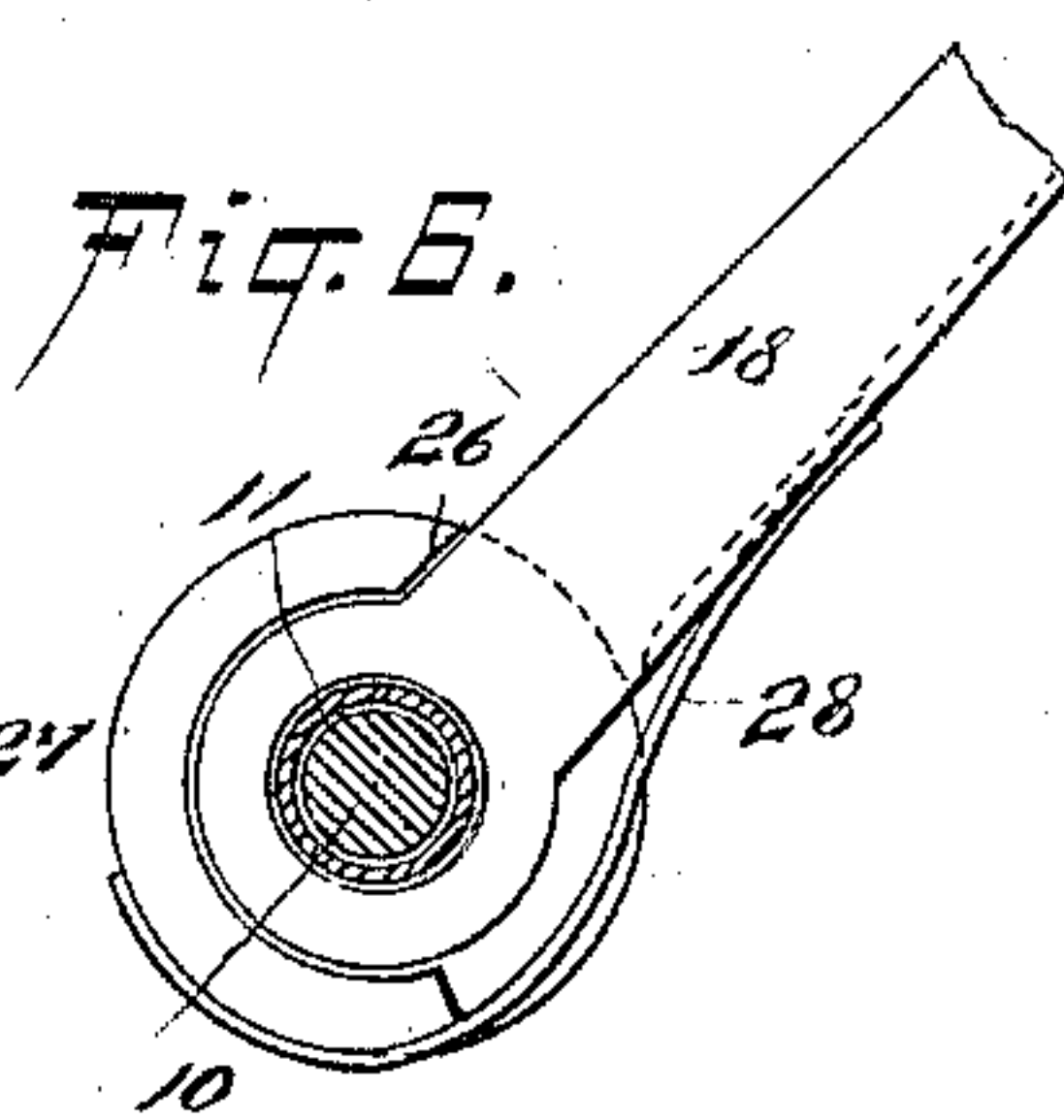


Fig. 6.

WITNESSES:

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# UNITED STATES PATENT OFFICE.

THOMAS M. CREPAR AND HUGH HUNTER, OF CLARE, MICHIGAN, ASSIGNORS  
OF ONE-THIRD TO FREDERICK LISTER, OF SAME PLACE.

## DRIVING-GEAR.

SPECIFICATION forming part of Letters Patent No. 540,208, dated May 28, 1895.

Application filed October 11, 1894. Serial No. 525,600. (No model.)

*To all whom it may concern:*

Be it known that we, THOMAS M. CREPAR and HUGH HUNTER, of Clare, in the county of Clare and State of Michigan, have invented a new and Improved Driving-Gear, of which the following is a full, clear, and exact description.

Our invention relates to improvements in driving gears and particularly to such gears as are applicable to bicycles. It is well known that it is easier for a rider to move his feet up and down on the pedal cranks or levers than it is to follow the pedals with the feet in a circle; and the object of our invention is to produce a simple running gear which has the pedals arranged to move up and down in the segment of a circle, and to produce a simple transmitting mechanism which is actuated by the pedal levers and is arranged to impart a rapid rotary motion to a driving sprocket wheel of the ordinary kind.

To these ends our invention consists of certain features of construction and combinations of parts, which will be hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation of a safety-bicycle provided with our improved driving-gear. Fig. 2 is an enlarged detail side elevation of the driving-gear. Fig. 3 is a broken side elevation of the driving-gear, but showing the opposite side from that illustrated in Fig. 2. Fig. 4 is a cross-section on the line 4-4 of Fig. 2. Fig. 5 is a detail sectional view showing the connection between one of the pedal-levers and the main driving-gear wheel, and Fig. 6 is a detail sectional view showing the manner in which the movement of the pedal-levers is regulated.

The machine has the ordinary pedal shaft 10 which is provided with the customary end nuts for holding it in place, and on this shaft is a hollow shaft or sleeve 11 which forms really the axle of the driving gear and which has the ordinary ball bearings 12 to support it in the frame 13 of the bicycle.

Loosely journaled on one end of the sleeve 11 is a main gear wheel 14 which has, on op-

posite sides, ratchet teeth 15 adapted to engage pawls by which the main gear wheel is turned, the teeth on the outer side of the wheel engaging a pawl 16 which is held in a recess 17 of a lever 18 and is pressed by a spring 19 into engagement with the teeth 15, as shown clearly in Fig. 5. The lever 18 is journaled loosely on the sleeve 11, as shown clearly in Fig. 4, and the other lever, to be presently described, is secured to the sleeve, provision being made for the alternate movement of the levers.

The inner teeth 15 of the main gear wheel 14 are engaged by a pawl 20 of a crank 21, the pawl having the same sort of connection with the crank as the pawl 16 has with the lever 18, and the crank is secured to the sleeve 11 which has also secured to it at one end a second pedal lever 22, and both levers 22 and 18 are provided with foot pedals 23 which may be of any desired pattern, but are preferably as shown in the drawings, in which they are illustrated as having heel sockets 24 which prevent the feet of the rider from slipping from the pedal. The levers have also a series of holes 25 at the ends to enable the pedals to be adjusted in and out, as desired.

The pedal levers 18 and 22 move up and down in the openings 26 of the burrs 27 which are secured to the ends of the shaft 10, and thus the movement of the levers is limited by the upper and lower walls of the openings 26. The levers are normally pressed upward by springs 28, as shown in Fig. 6, and consequently after a lever has been depressed by the foot of the rider it is automatically returned when the foot is raised, so as to bring the lever in position for another movement. At each down stroke of the levers the main gear wheel 14 is turned by one of the pawls 16 or 20, and hence as the levers move alternately, a constant movement in one direction is imparted to the gear wheel.

The main gear wheel 14 meshes with a horizontal gear wheel 29 which turns on a depending stud 30 of the frame 13, and the gear wheel 29 meshes with a second vertical gear wheel 31 which is journaled on a stud 32 projecting from the main stud 30, as shown in Fig. 4, and the gear wheel 31 meshes also with a pinion 33 which turns loosely on the sleeve



11 and is secured to the hub of a large sprocket wheel 34 and this connects by means of the common chain 35 with the sprocket wheel 36 which is arranged in the usual way on the hub of the rear wheel of the bicycle.

It will be seen that a large sprocket wheel 34 may be used, so that the bicycle may be driven with great speed, and that the up and down movement of the pedals, together with the connection between them and the sprocket wheel, enables the sprocket wheel to be driven with comparative ease.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. The combination, with the axle and the sleeve thereon, of the main gear wheel loose on the sleeve, the vertically movable pedal levers, one of which is loose on the sleeve and the other secured thereto, a pawl and ratchet connection between one of the levers and the main gear wheel and between the sleeve and the main gear wheel, a sprocket wheel on the sleeve, and a driving connection between the sprocket wheel and the main gear wheel, substantially as described.

2. The combination with an axle, and a sleeve thereon, of a gear wheel loosely mounted on the sleeve and provided with ratchet teeth on opposite sides, vertically movable pedal levers, one of which is mounted loosely on the sleeve and the other secured thereto, a pawl carried by one of the pedal levers and

engaging the ratchet teeth on one side of the gear wheel, an arm secured to the sleeve, a pawl carried by the arm and engaging the ratchet teeth on the other side of the said gear wheel, a sprocket wheel loose on the sleeve, and gearing between the sprocket wheel and the gear wheel loose on the sleeve, substantially as described.

3. The combination with an axle, and a sleeve thereon, of a gear wheel loose on the sleeve and provided with ratchet teeth on opposite sides, a pedal lever loose on the sleeve, a pawl carried by the pedal lever and engaging the ratchet teeth on one side of the gear wheel, a second pedal lever secured to the other end of the sleeve, an arm secured to the sleeve adjacent to the loose gear wheel, a pawl carried by the said arm and engaging the ratchet teeth on the other side of the said gear wheel, a sprocket wheel loose on the sleeve, a pinion on the hub of the sprocket wheel, a gear wheel carried by the frame and meshing with the pinion, and a second gear wheel carried by the frame and meshing with the first named gear wheel of the frame and the gear wheel loose on the sleeve, substantially as described.

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Witnesses:

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