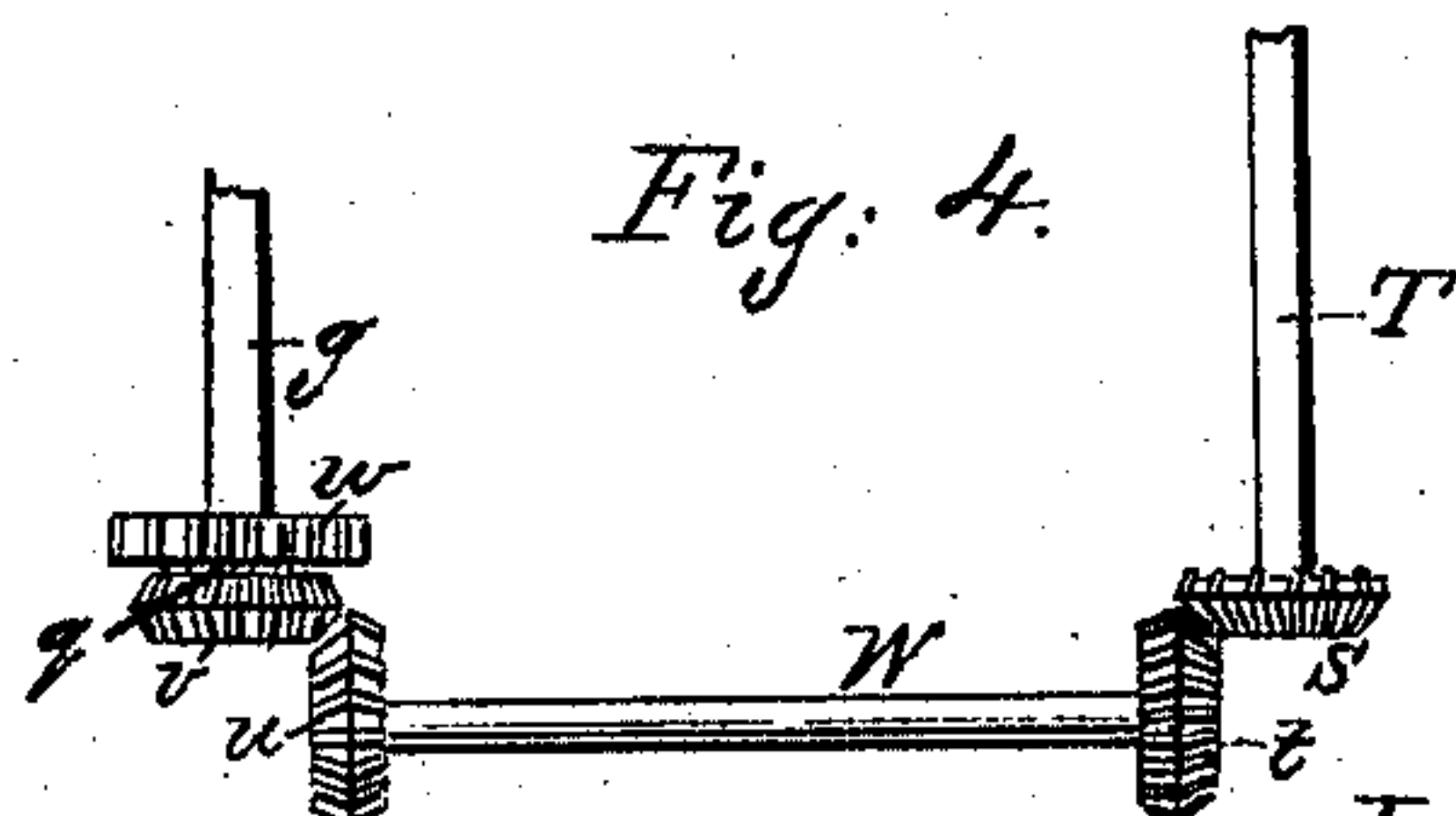
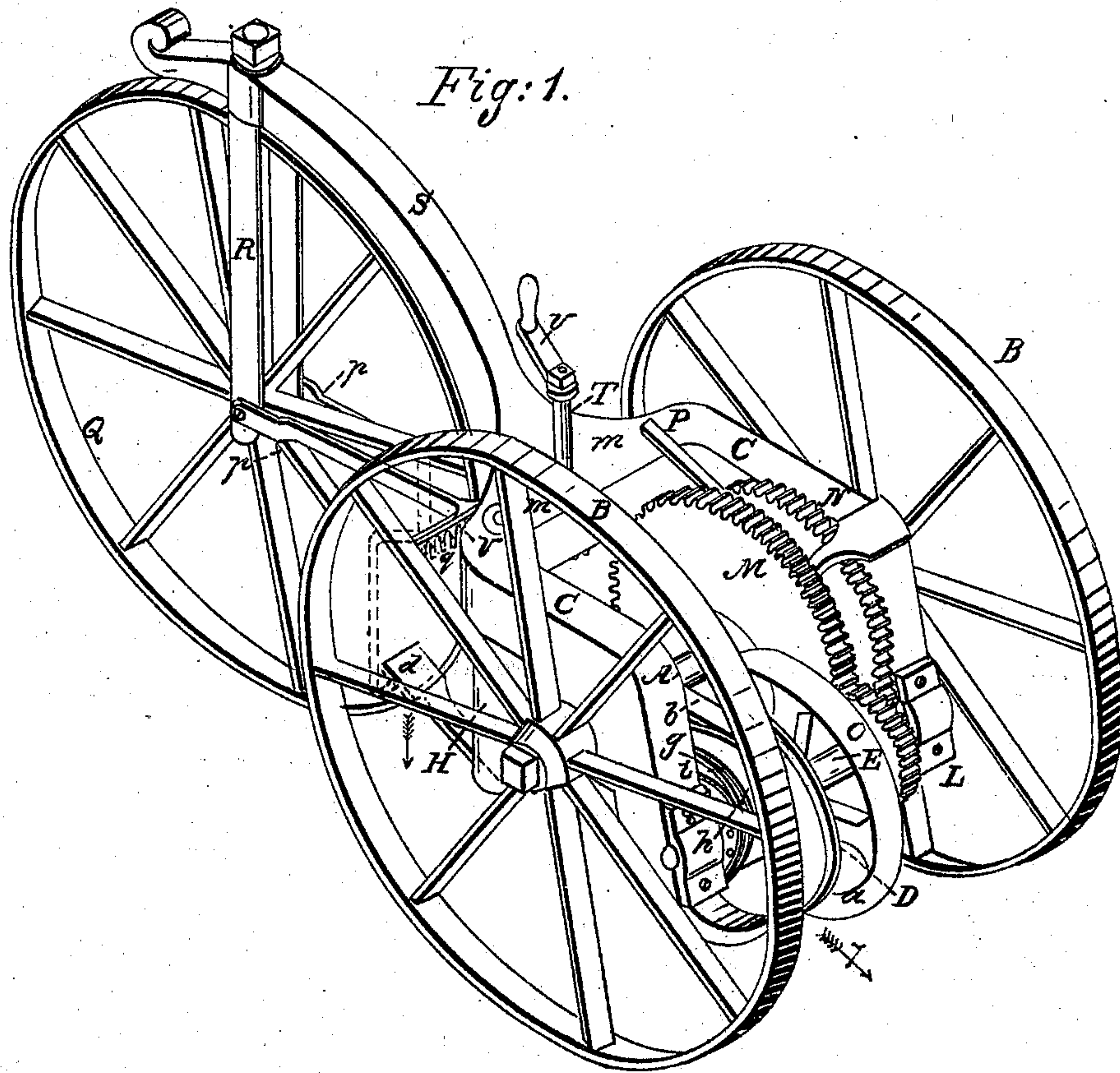


S. WILMARTH.

Velocipede.

No. 89,822.

Patented May 4, 1869.



Witnesses;

S. N. Piper.
W. J. Cambridge.

Inventor;

Seth Wilmarth
Per his Attorneys
Teschmacher & Sears.

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Fig: 2.

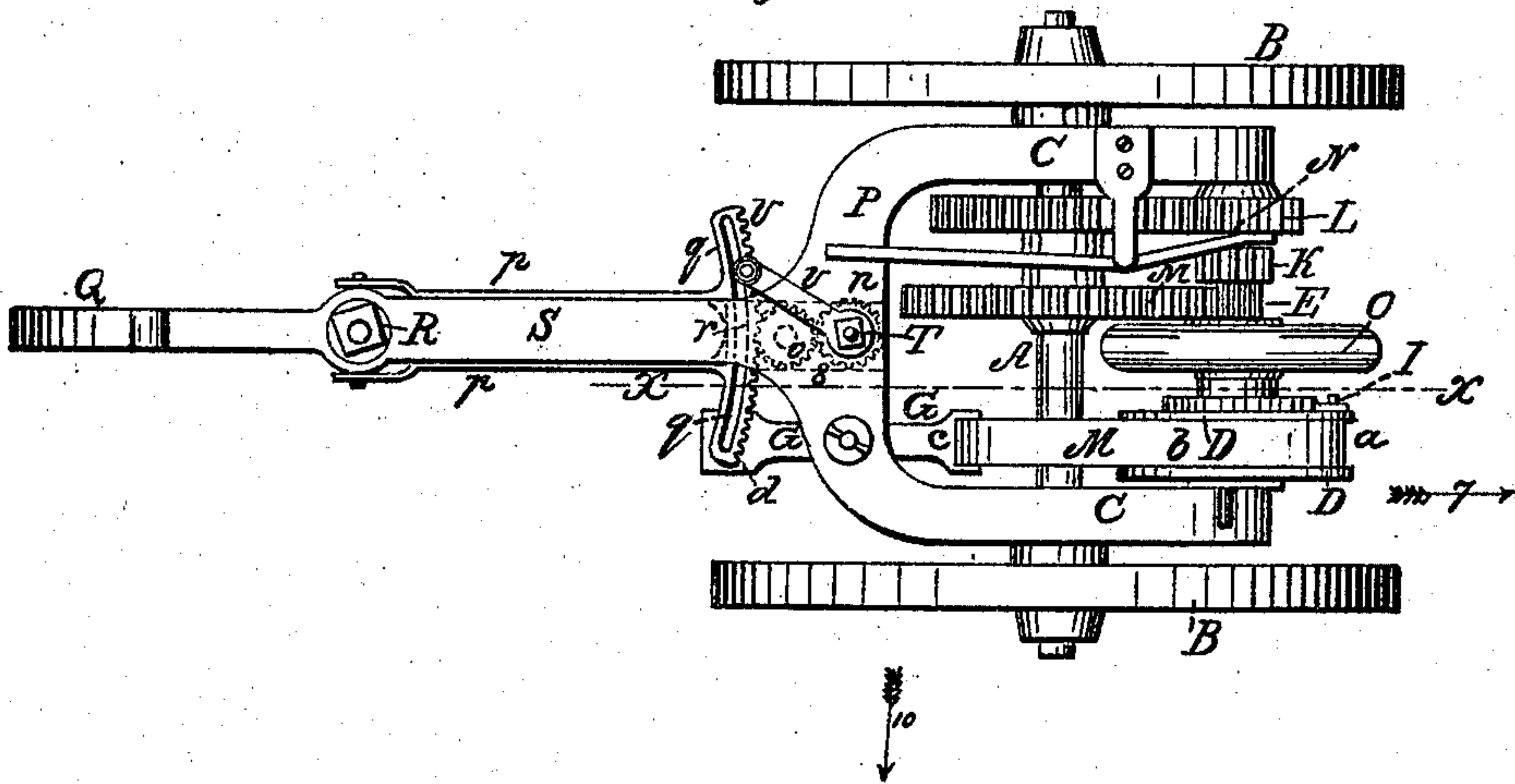
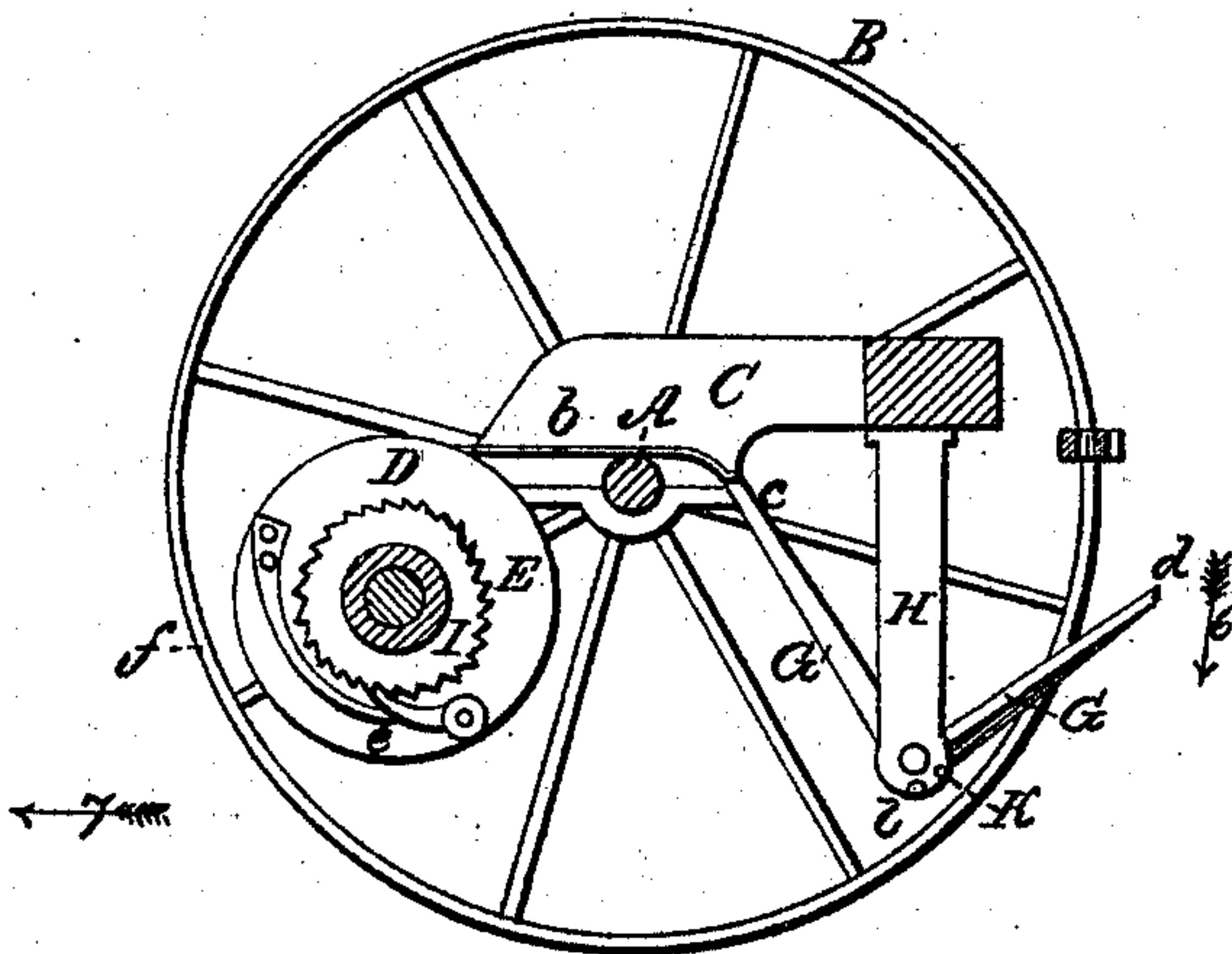


Fig: 3.



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W. J. Cambridge.

Inventor.

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Per his Attorneys
Feschmacker & Stearns.

United States Patent Office.

SETH WILMARTH, OF MALDEN, MASSACHUSETTS.

Letters Patent No. 89,822, dated May 4, 1869.

IMPROVEMENT IN VELOCIPEDES.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, SETH WILMARTH, of Malden, in the county of Middlesex, and State of Massachusetts, have invented certain Improvements in Street-Carriages or Velocipedes; of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a perspective view of my improved street-carriage or velocipede.

Figure 2 is a plan of the same.

Figure 3 is a section on the line $x x$, of fig. 2, looking in the direction of the arrow 10.

Figure 4 is a detail to be referred to.

This invention relates to certain improvements in street-carriages or velocipedes, and consists in applying the power to an auxiliary shaft, provided with a fly-wheel, and connected with the main shaft or axle by suitable gearing, the fly-wheel serving to collect and retain the power, while the force exerted to produce the momentum of the fly-wheel is retained by the mass in motion, and thence transmitted to the main shaft or axle, for the purpose of equalizing the motion and preserving a uniform rate of speed; and my invention also consists in the construction and arrangement of certain mechanism, to be detailed hereafter.

To enable others skilled in the art to understand and use my invention, I will proceed to describe the manner in which I have carried it out.

In the said drawings, A represents the main shaft or axle of a street-carriage or velocipede, with the wheels B B secured thereto at its extremities, the shaft having its bearings in the frame C, which is of the form shown in figs. 1 and 2.

The shaft A is revolved by the foot of the rider in the following manner: D is a hollow drum or pulley fitted loosely upon an auxiliary shaft, E, which is parallel to the main shaft A, and is supported in bearings in opposite ends of the lower portion of the front of the frame-work.

Within the periphery or outer cylindrical surface of this drum D, is formed a rectangular groove a , for the reception of a strong leather strap or band b , which extends partially around the drum, one extremity being secured to it by a screw or rivet, while its opposite end passes over the main shaft A, and is connected to the upper end of the arm c , of a bent lever, G, which is pivoted to a bifurcated support H, the outer end of the arm d of the bent lever serving as a treadle, upon which the foot may exert its power.

On the inner face of the drum D is pivoted a pawl e , which engages with the teeth of a ratchet-wheel, I, secured to or forming a part of the shaft E, a spring, f , serving to keep the pawl in contact with the teeth of the ratchet-wheel I, and thus, as the treadle of the foot-lever is forced down in the direction of the arrow 6, the drum D is partially revolved by the strap b , and its motion communicated, through the pawl e and

ratchet-wheel, to the auxiliary shaft E, and thence by a gear, K or L, secured thereon, to a gear, M or N, secured to the main shaft or axle A.

As soon, however, as the pressure of the foot is removed from the treadle of the foot-lever, the drum D is revolved in the contrary direction (arrow 7) by a flat coiled spring g , one end of which is secured to a collar, h , fitting loosely over the auxiliary shaft, while its opposite end is secured to a pin or projection, i , on the inside of the rim of the drum, by which construction the treadle of the foot-lever is returned to its original position, ready to be again forced down by the foot, the pawl e , passing freely over the teeth of the ratchet-wheel, as the drum D is carried back by the retracting spring g .

The drum D is prevented from moving laterally on the auxiliary shaft by means of the ratchet-wheel I, on one side, and the collar h , on the other side, the latter being provided with a series of holes for the entrance of a pin, whereby the torsion of the spring g may be adjusted to insure the treadle following the foot up to the required position, to properly receive its next downward stroke; the motion of the treadle downward being limited to the range of the foot by a shoulder, k , on each side of the foot-lever, coming in contact with a corresponding shoulder l , on each side of the lower end of the bifurcated support H.

In the foregoing, I have described how the impact or force exerted by the foot is conveyed to the auxiliary shaft, and thence, by gear K and M, or L and N, to the main shaft or axle A.

I will now particularly refer to the chief feature of my present invention.

O is a heavy fly or compensating-wheel secured to the auxiliary shaft E, for the purpose of collecting and retaining the power exerted by the foot on the treadle; whereby any unequal or sudden strain on the main shaft, by meeting with obstacles, or in ascending steep ground, is equalized so that a uniform rate of speed may be preserved without any unusual exertion of the rider.

P is a shipper, operated by hand, for throwing the wheels K and L in and out of gear with the wheels M and N, in order to vary the rate of speed when desired.

In going up hill, where considerable power is required, I cause the gear K to engage with the gear M, the auxiliary shaft E making about six revolutions to one of the main shaft A.

But in travelling over ground comparatively level I require less power, and throw the wheel L into gear with the wheel N, when the auxiliary shaft E makes about two revolutions, while the main shaft or axle A is making one.

Q is the rear wheel, the axle of which has its bearings in the opposite sides of the lower ends of a forked standard R, passing loosely down through the interior of the rear end of the reach or perch S of the frame,

whereby the standard may, with the wheel Q, be inclined to any desired angle from a plane passing longitudinally through the centre of the perch, to enable the direction of the carriage to be changed by the operator in a manner presently to be explained.

The horizontal portion of the frame should be extended some distance to the rear of the point *m*, fig. 1, to afford ample room for the operator's seat, in which case the wheel Q. would be removed further from the main shaft, and the reach or perch would not commence to curve upward until at some point in the rear of the driver's seat.

T is a vertical-shaft, passing through the horizontal portion of the frame, and provided at its top with a crank U, within convenient reach of the hand of the driver; the bottom of this crank-shaft being provided with a pinion, *n*, which engages with a similar pinion *o*, on a plate 8, (seen dotted,) the latter pinion engaging with and moving a long segmental rack, V, the arms *p* of which are secured at their extremities to the opposite sides of the axis of the rear or guiding-wheel Q.

This segmental rack V is provided with a slot, *q*, for the reception of a short pin, *r*, projecting down from the plate 8, by which the rack is kept up to the pinion *o*, to insure their meshing together, and serves as a support or truss for the wheel Q.

In practice, I intend to move the segmental rack V by means of a horizontal shaft, W, provided with bevel-gear, as seen in fig. 4, in which case the pinion *n* may be dispensed with, and a bevel-gear, S, be secured to the bottom of the vertical-steering shaft T, and drive a bevel-gear, *t*, on one end of the horizontal shaft W; a bevel-gear, *u*, on the other end of said shaft W, engaging with a corresponding bevel-gear *v*, on a short pin 9, which also carries a straight pinion, *w*, which meshes into and drives the segmental rack V, as required.

It will be seen that the power is applied to the periphery of the drum D, on the auxiliary shaft, and that by increasing the diameter of the drum the leverage may be increased (without necessitating any increase in the length of stroke of the foot-lever) to a point much beyond that which can be attained by the use of cranks, as the length of the latter must be limited within the range of action of the limbs of the rider.

Furthermore, by our improvements the same leverage or power is exerted, whether the stroke of the foot-lever is long or short, thus adapting it for persons with limbs of various lengths.

By extending up the portion or arm *d* of the foot-lever G, as seen in red, fig. 1, it may be operated either by hand or by foot, or by both, simultaneously, if desired.

Claim.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The auxiliary shaft E, with its fly-wheel O, connected with the main shaft by means of described gearing, combined with a foot-lever, G, and a steering-wheel Q, substantially as and for the purpose set forth.

2. Also, the foot-lever G, strap *b*, drum D, with its retracting-spring *g*, pawl *e*, and the ratchet-wheel I, in combination with the auxiliary shaft E, provided with a fly-wheel, O, and connected with the main shaft A by suitable gearing, substantially as and for the purpose set forth.

3. Also, limiting the motion of the foot-lever G by the shoulders *k k*, in combination with the shoulders *l l*, in the bifurcated support H, in which it is pivoted, substantially as set forth.

SETH WILMARTH.

Witnesses:

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W. J. CAMBRIDGE.