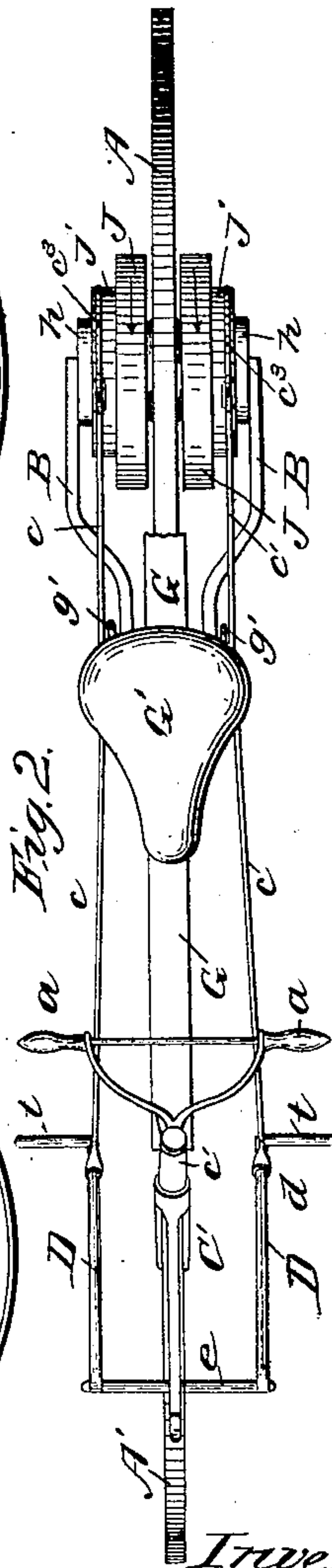
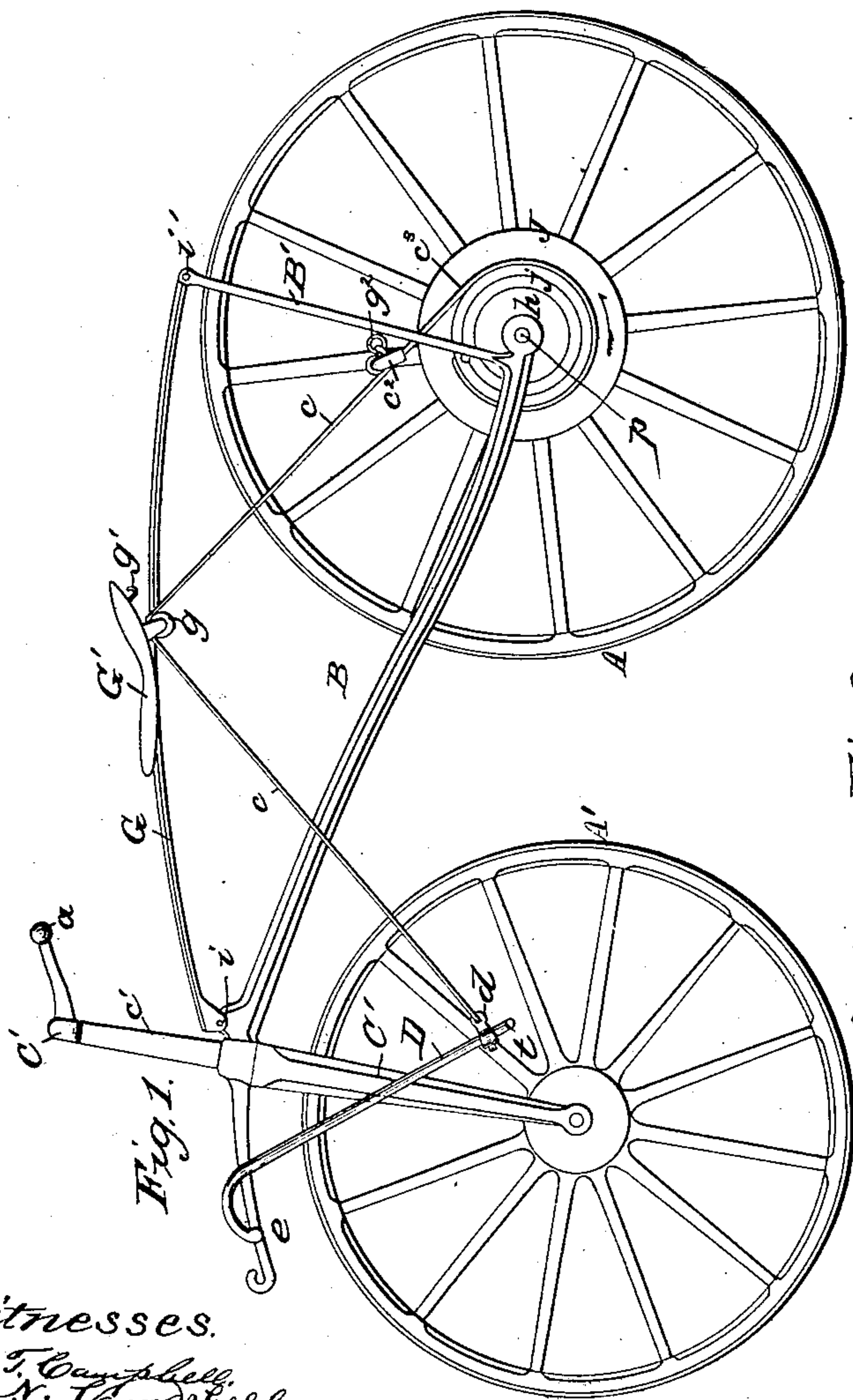
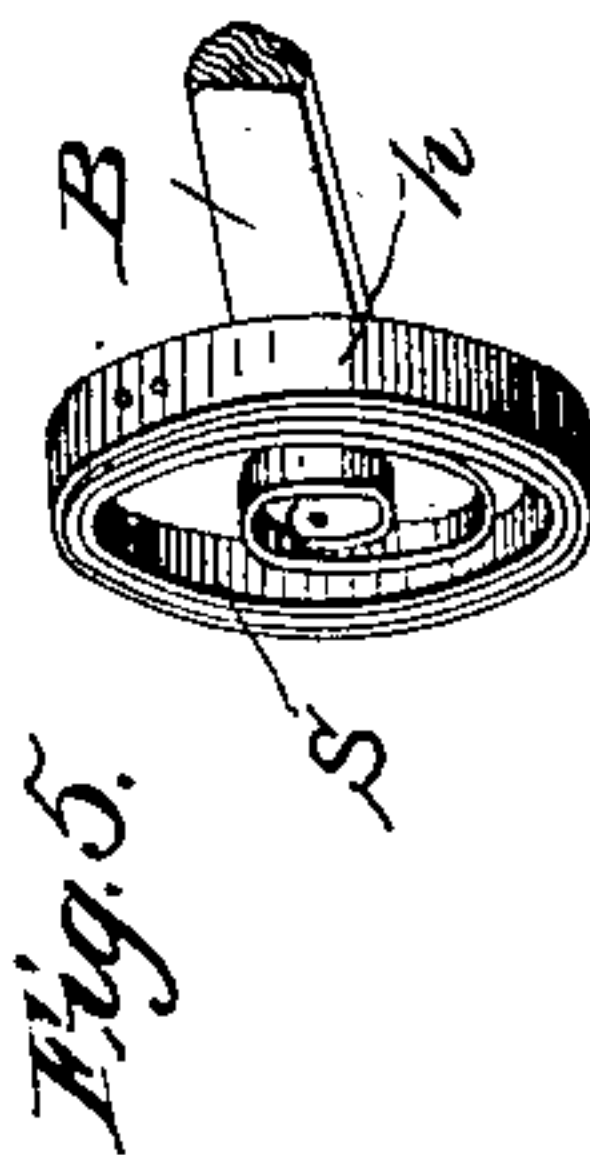
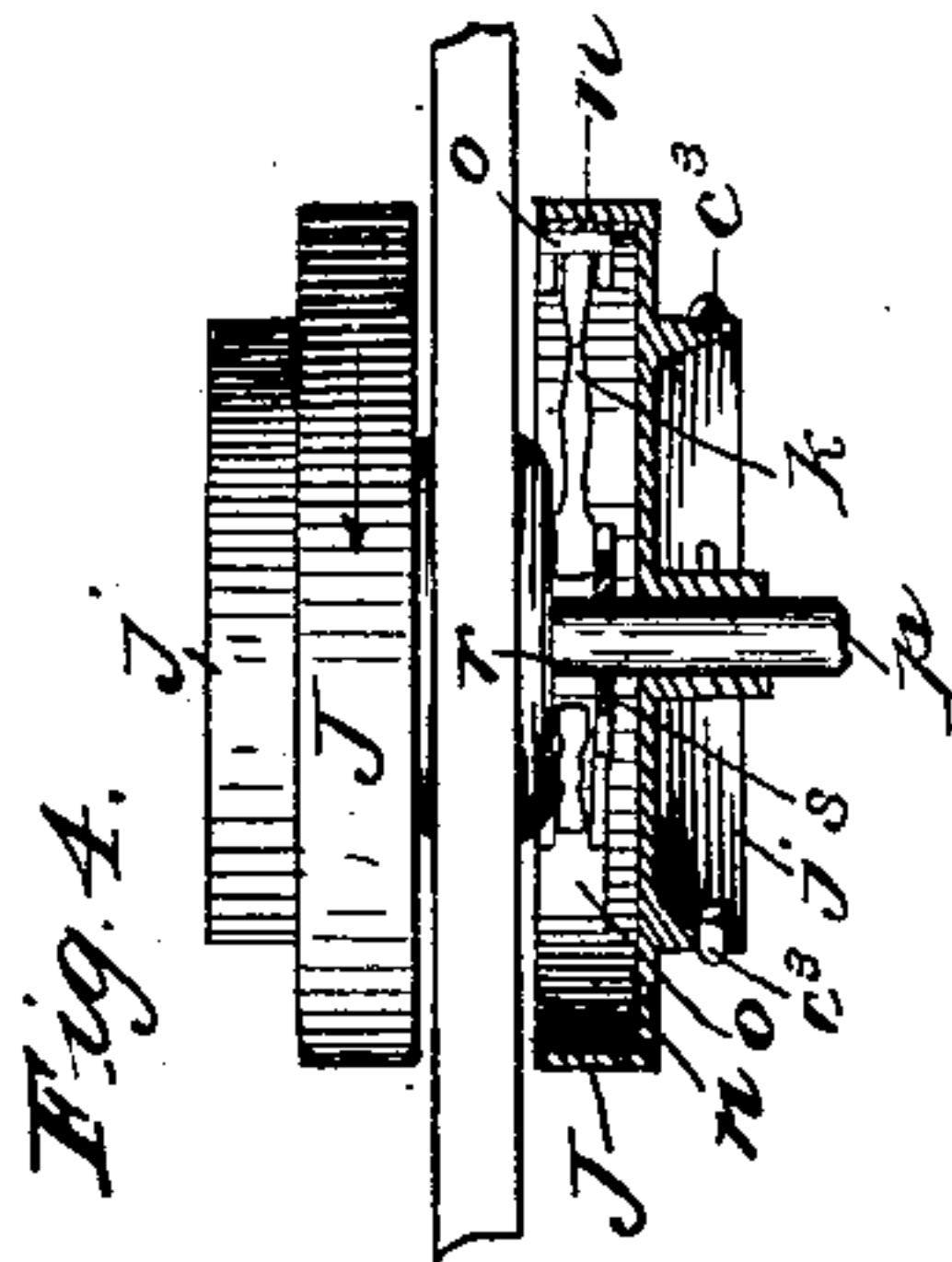
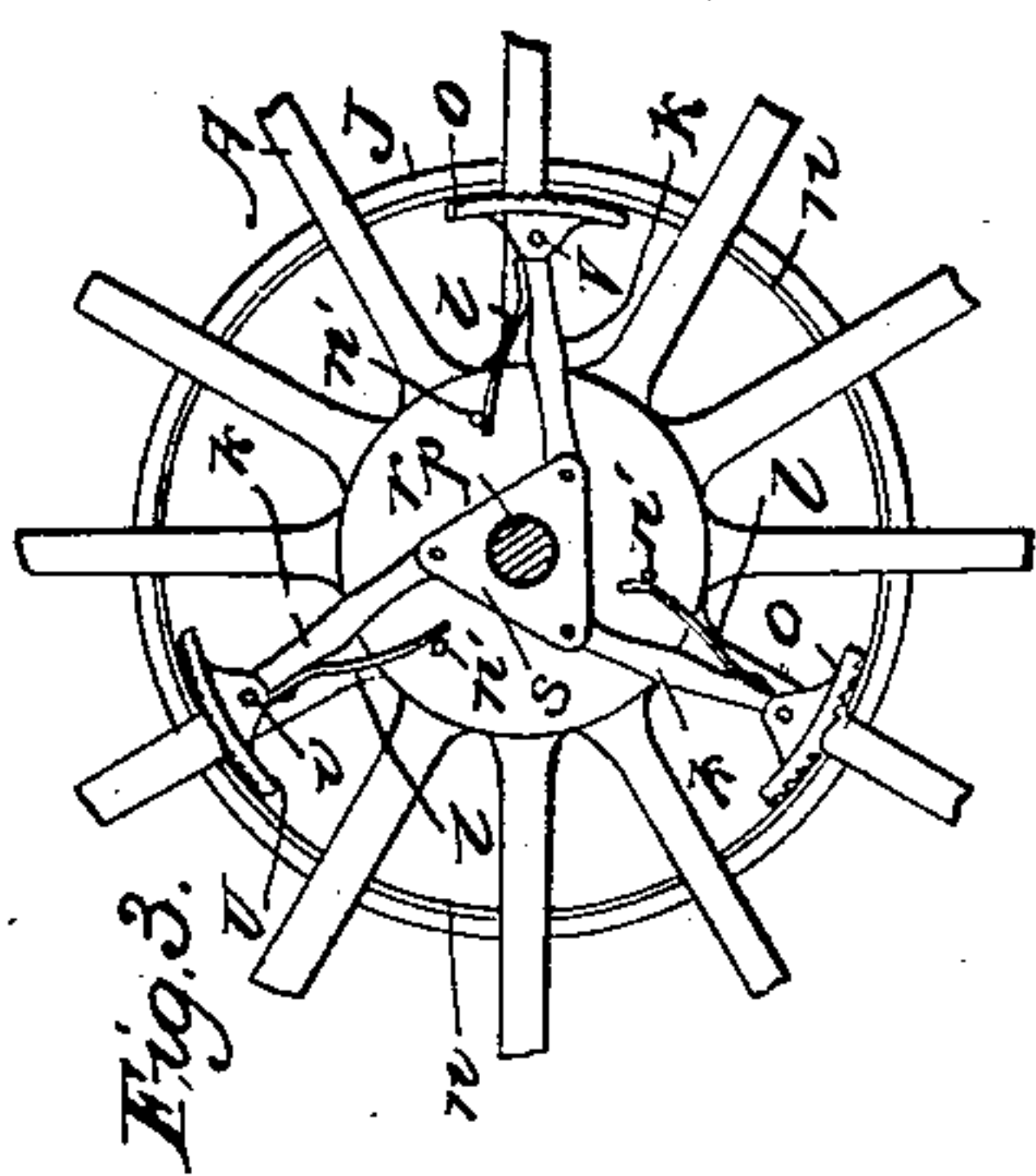


E. COWLES & G. R. METTEN.
VELOCIPEDÉ.

No. 89,293.

Patented Apr. 27, 1869.



Witnesses.

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EDWIN COWLES AND GEORGE R. METTEN, OF CLEVELAND, OHIO.

Letters Patent No. 89,293, dated April 27, 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 we, EDWIN COWLES and GEORGE R. METTEN, of Cleveland, in the county of Cuyahoga, and State of Ohio, have invented certain new and useful Improvements in Velocipedes; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is an elevation of our velocipede complete.

Figure 2 is a top view of the same, with the rear portion of the seat-spring broken away.

Figure 3 shows the hub of the rear wheel, with three dogs or pawls applied to one side of it, for acting upon a drum, which is not shown in this figure.

Figure 4 is a top view of a portion of the rear wheel, with the drums and pulleys applied to its hub, showing one of the drums and pulleys in section.

Figure 5 is a perspective view of one of the spring-boxes on a portion of one of the rear forked ends of the perch connecting the two wheels.

Similar letters of reference indicate corresponding parts in the several figures.

This invention relates particularly to improvements on two-wheel carriages or velocipedes, and consists—

First, in giving a progressive rotary motion to the rear wheel of the carriage by means of belts passing over pulleys, and connected at their front ends to treadles or stirrups, and at their rear ends to pulleys, which are applied upon the outer surfaces of drums that act upon pawls upon the ends of said wheel, said drums being applied loosely upon the axle of the driving-wheel, and acted upon by springs applied in boxes upon the rear bearings of the perch in such manner that they operate to turn the wheel in one direction only, and while being retracted or turned backward by their respective springs, they assist the rider in lifting his feet after every forward thrust thereof, all as will be hereinafter explained.

Secondly, in adapting the belts, which are used to give progressive rotary motion to the carriage to serve in conjunction with the loose and fixed pulleys as a means of enabling the rider to apply greater power while ascending hills than is required when moving over level roads, as will be hereinafter explained.

We are aware that E. K. W. Blake obtained Letters Patent of the United States on the 17th day of November, 1868, on a mode of propelling a velocipede having two rear wheels and one guide-wheel by the application of loose hollow pulleys on the driving-axle, having pawls taking into ratchets within the said pulleys secured to the axle, and belts for operating the pulleys passing over guide-pulleys at the front of the machine to the hands of the operator, whereby he may propel the machine by pulling from directly in front of him.

This plan of Blake is not applicable to the rear

wheels of a two-wheel carriage, and is attended with noise and other objections, which we obviate by our improved arrangement and construction of devices.

We are also aware that George R. Metten, one of the applicants under this petition, filed an application for Letters Patent, on the 21st day of January, 1869, in which he described a mechanical movement consisting of oscillating hollow drums applied loosely upon the shaft of a balance-wheel and adapted for communicating through the medium of spring-clutch arms, a continuous rotary motion to said balance-wheel.

To enable others skilled in the art to understand our invention, we will describe its construction and operation.

In the accompanying drawings—

A A' represent two wheels, which are arranged in the same vertical plane, and connected together by means of a curved reach or perch, B.

The rear portion of this perch B is forked and receives between the arms thus formed the driving-wheel A, the axle *p* of which is secured at its ends to the extremities of these arms.

The front elevated end of the perch B has two vibrating arms or treadles D D pivoted to it at *e*, in rear of which a tubular eye bearing, *c'*, rises from and is formed on the perch for the purpose of receiving the journal portion C' of the forked standard C' of steering-wheel A'.

To the upper end of the journal C, handles *a a* are applied, by which the rider, while sitting upon the seat G', can turn the standard C' to the right or left hand, and thus guide the carriage.

The seat or saddle G' is secured to an arched spring, G, which is pivoted at *i* near the tubular bearing *c'*, and at *i* to the upper end of standard B', rising from the rear forked ends of the perch, as shown in fig. 1.

The vibrating treadles D D, which are arranged on opposite sides of the front guide-wheel A' are provided on their free ends with foot-rests *t t*, and also with adjustable clasps or eyes *d d*, which latter can be adjusted and set nearer to or further from the pivot-attachments *e e* of said levers, as may be required.

To the clasps *d d*, cords or belts *c c* are fastened at their front ends, carried back and passed over pulleys *g*, beneath seat G, and thence attached by rings or snaps *g'* to loose pulleys, which are fastened by their blocks to cords or belts that pass over and are fastened to pulleys *j j* upon the outer ends of two hollow drums J J.

The drums J J are disks having flanged perimeters, and these drums are applied loosely upon the axle *p* of the rear wheel A and arranged on opposite sides of this wheel, as shown in fig. 4.

The outwardly extending hub of each drum J is connected to one end of a volute spring, S, whose opposite end is attached to the flange of a circular box

h, which box encloses the spring and is formed on or secured to the rear end of the perch *B*, as shown in figs. 1, 2, and 5.

The object of the spring *S S*, in boxes *h h*, is to retract or wind the cords or bands *c³ c³*, upon their pulleys *j j* after every forward stroke of the treadles, thereby assisting the rider to retract or lift his feet, and at the same time keeping said drums always in proper position for acting upon the wheel *A*, as will be hereinafter further explained.

To each end of the hub *r* of wheel *A*, three arms, *k k k*, of equal length, are pivoted at equal distances apart around its axis, and at points concentric to its axis, the outer ends of which arms have segmental dogs, *o*, pivoted to them at *v*.

The outer convex surfaces of the dogs *o* are serrated and adapted to act against the inner surface of the flange of their enclosing drum *J*, which surface may be covered, as at *n*, figs. 3 and 4, with leather, or other suitable substance, to produce friction between it and the said dogs.

It will be seen that the arms of the dogs *o* are all tangent to the circumference of the axle *p*, and that these arms are acted upon by springs *l*, pressing against stops *n'* on the hub *r*; consequently when either one of the drums *J* is turned in the direction indicated by arrows in figs. 1, 2, and 4, the surface *n* will act upon the serrated surfaces of the dogs and cause the arms *k* to press these dogs outwardly, and thus bite the drum so as to clutch or engage it with the wheel *A*.

When either one of the drums is turned backward by its spring *S*, the free ends of the arms *k* will retract the dogs *o* and allow such drum to turn freely around the axle *p* of the wheel *A* without turning this wheel; and when either one of the drums is acted upon by the cord or belt *c* to turn wheel *A*, the dogs *o* of the opposite drum will be retracted and allowed to revolve around axle *p*, with their wheel *A*, without turning or acting upon this drum.

Thus, it will be seen that the wheel *A* can be turned

in one direction around its axle by alternately pressing forward the treadles *D D*.

When it is desired to ascend a hill, or from any cause a greater expenditure of power is required to propel the carriage than would be required upon a level road, we attach the ends of cords *c c* to hooks *g¹ g¹* at the back of the seat *G'*, by means of the rings *g² g²*, as indicated in red lines, fig. 1.

This will give the rider a greater purchase though obtained at an expense of speed.

Instead of attaching the front ends of the cords or belts *c c* to vibrating treadles, these ends may have stirrups applied to them, or they may be attached to the lower ends of vertically-vibrating hand-levers, in which latter instance the front wheel would have to be guided by the feet.

Having described our invention,

What we claim as new, and desire to secure by Letters Patent, is—

1. The arrangement of the drums *J J*, shaft *p*, wheel *A*, springs *S*, clutching-pawls, belts *c*, and treadles *D D*, in combination with the wheel *A'*, frame or perch *B C'*, and seat *G'*, substantially in the manner and for the purpose described.

2. The arrangement of the device *g²*, hook *g¹*, and cord *c*, in combination with a velocipede, which is constructed and operated substantially as described.

3. The combination and arrangement of the devices *d*, cords *c*, and treadles *D D*, with a velocipede, constructed and operated as herein described.

4. The arrangement and combination of the guiding-lever *C*, seat *G'*, treadles *D D*, perch or frame *B*, cords *c c*, drums and clutching-pawls, springs, and tracking-wheels *A A'*, substantially in the manner shown and described.

EDWIN COWLES.
GEO. R. METTEN.

Witnesses:

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DAN. H. RIDGWAY.