

(No Model.)

3 Sheets—Sheet 1.

W. H. ADDICKS.

VELOCIPED.

No. 357,138.

Patented Feb. 1, 1887.

Fig. 1.

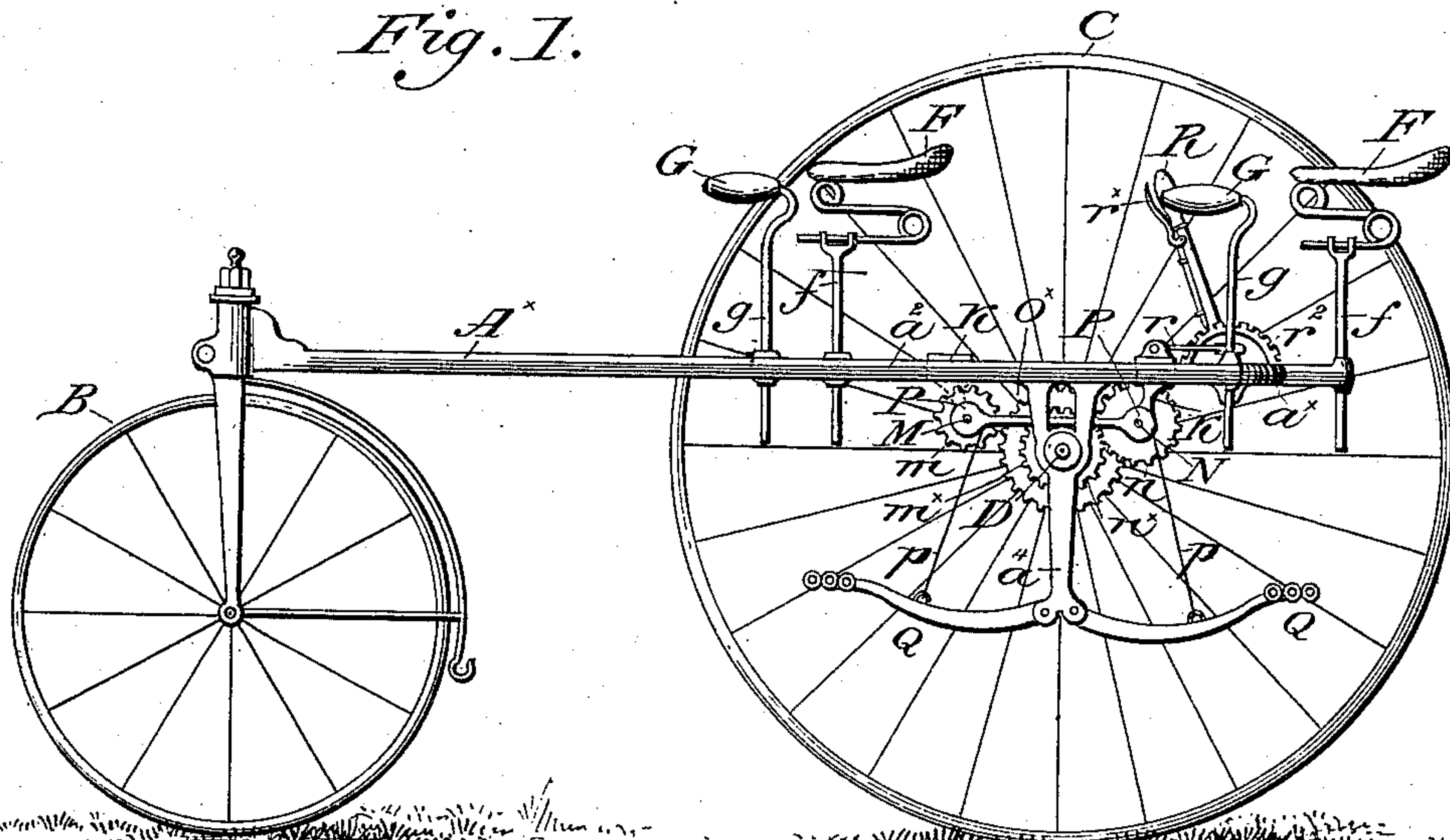
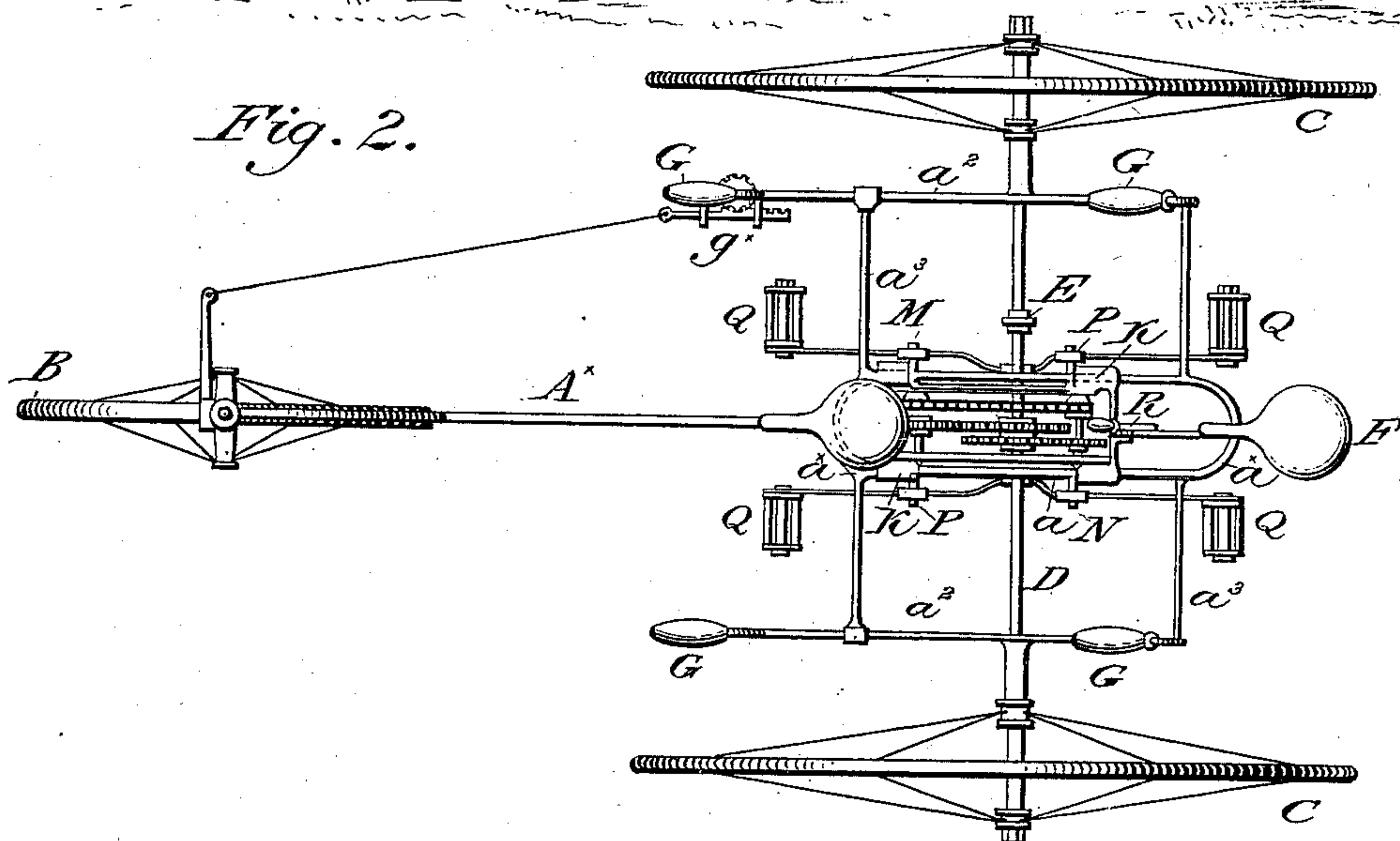


Fig. 2.



Com H. Addicks,

INVENTOR

INVENTOR
By his Attorneys,
W. C. Strawbridge,
J. Borsall Taylor

WITNESSES:

P. F. Hagle.
John Polley Jr

(No Model.)

3 Sheets—Sheet 2.

W. H. ADDICKS.
VELOCIPEDÉ.

No. 357,138.

Patented Feb. 1, 1887.

Fig. 3.

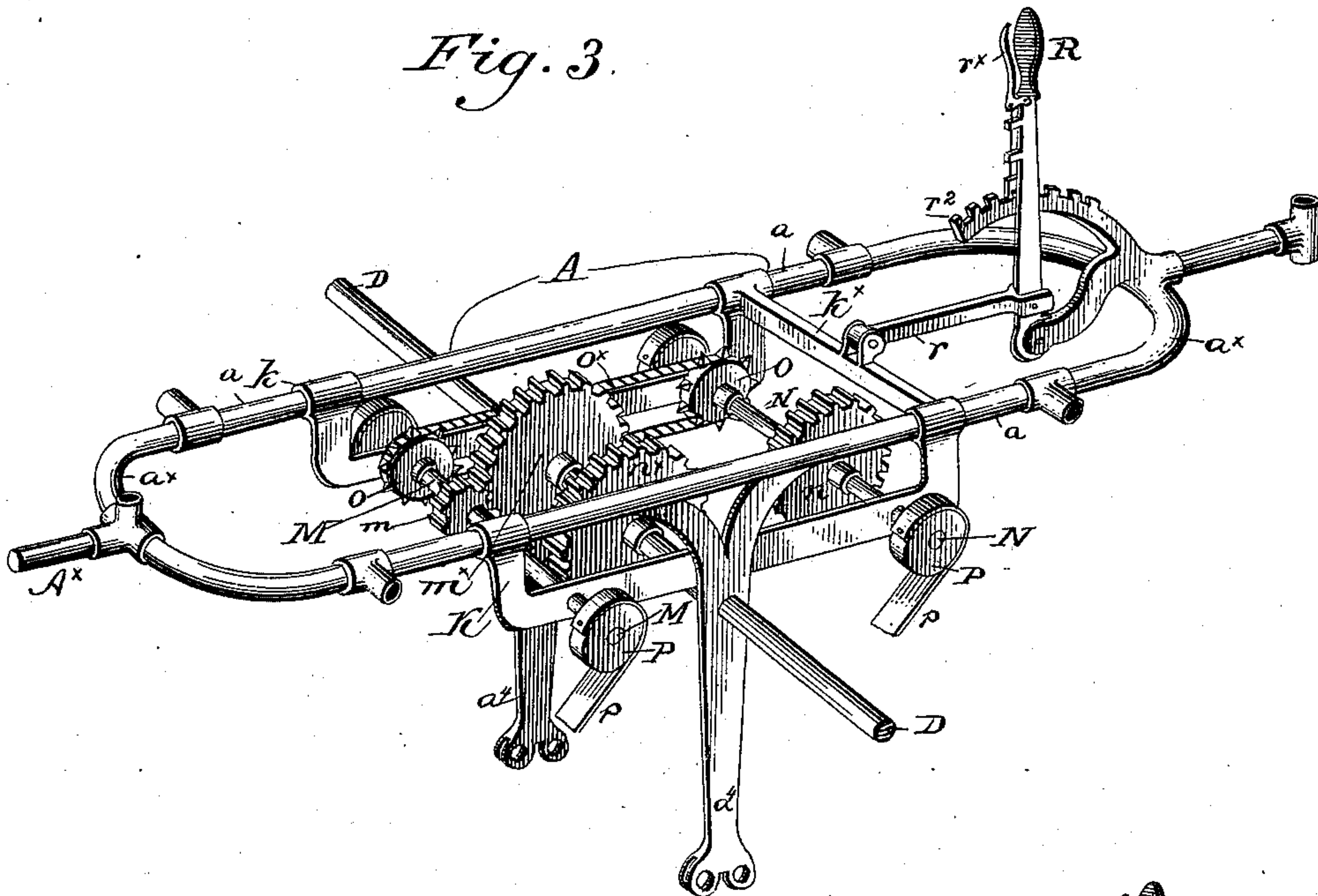
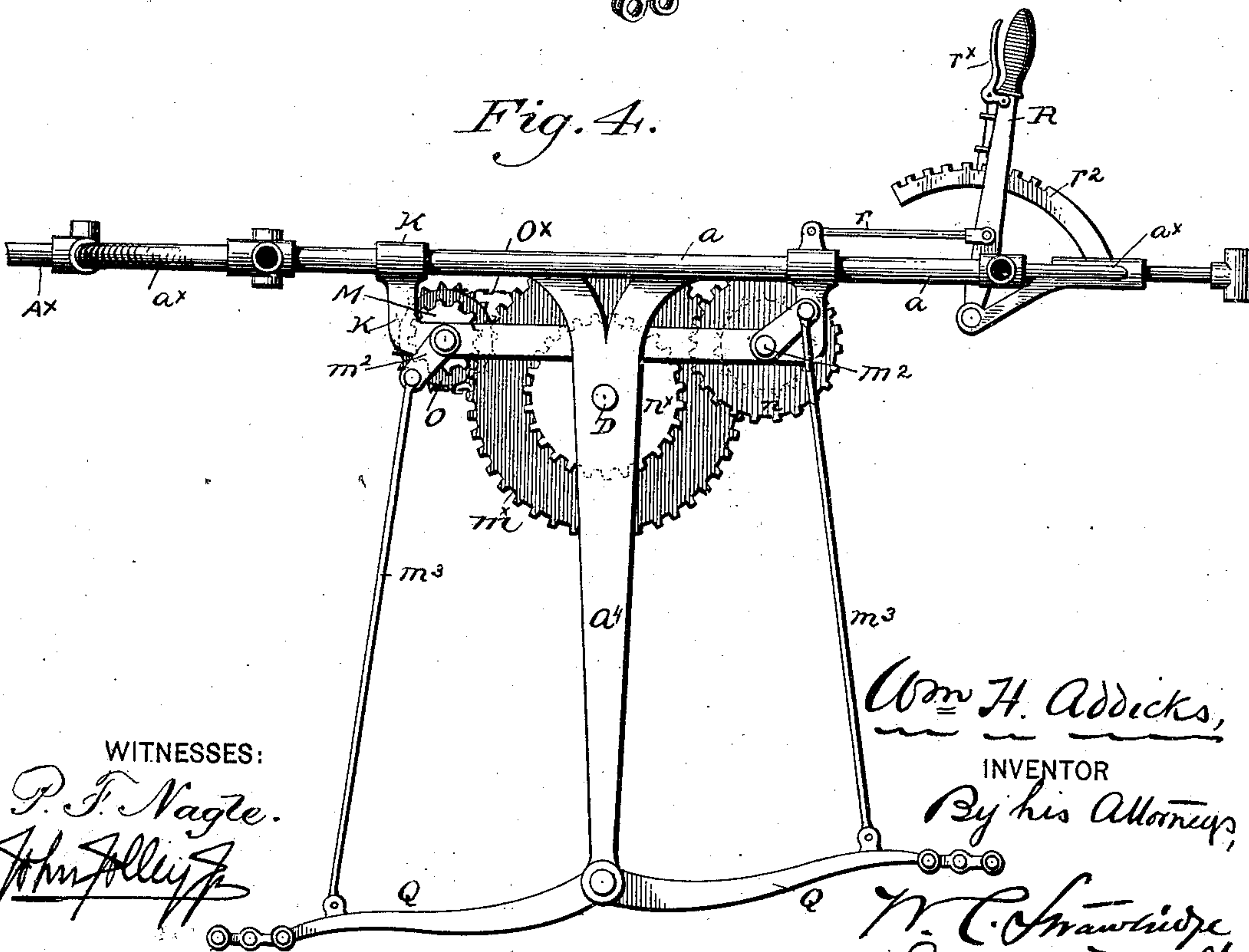


Fig. 4.



WITNESSES:

P. F. Nagle.
John J. Kelly

Wm H. Addicks,
INVENTOR
By his Attorneys,

W. C. Strawbridge
& Benson Taylor

(No Model.)

3 Sheets—Sheet 3.

W. H. ADDICKS.

VELOCIPÈDE.

No. 357,138.

Patented Feb. 1, 1887.

Fig. 5.

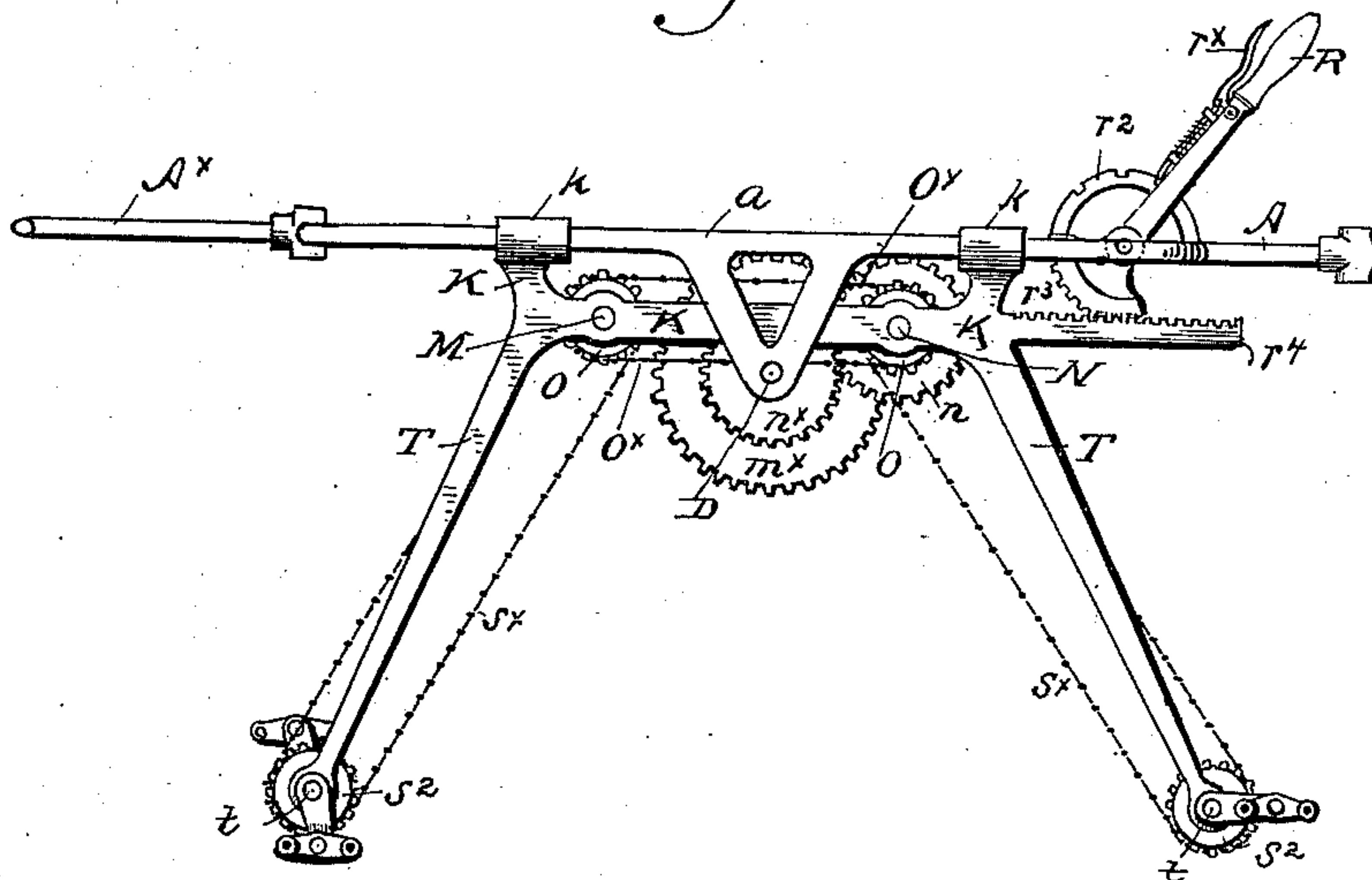
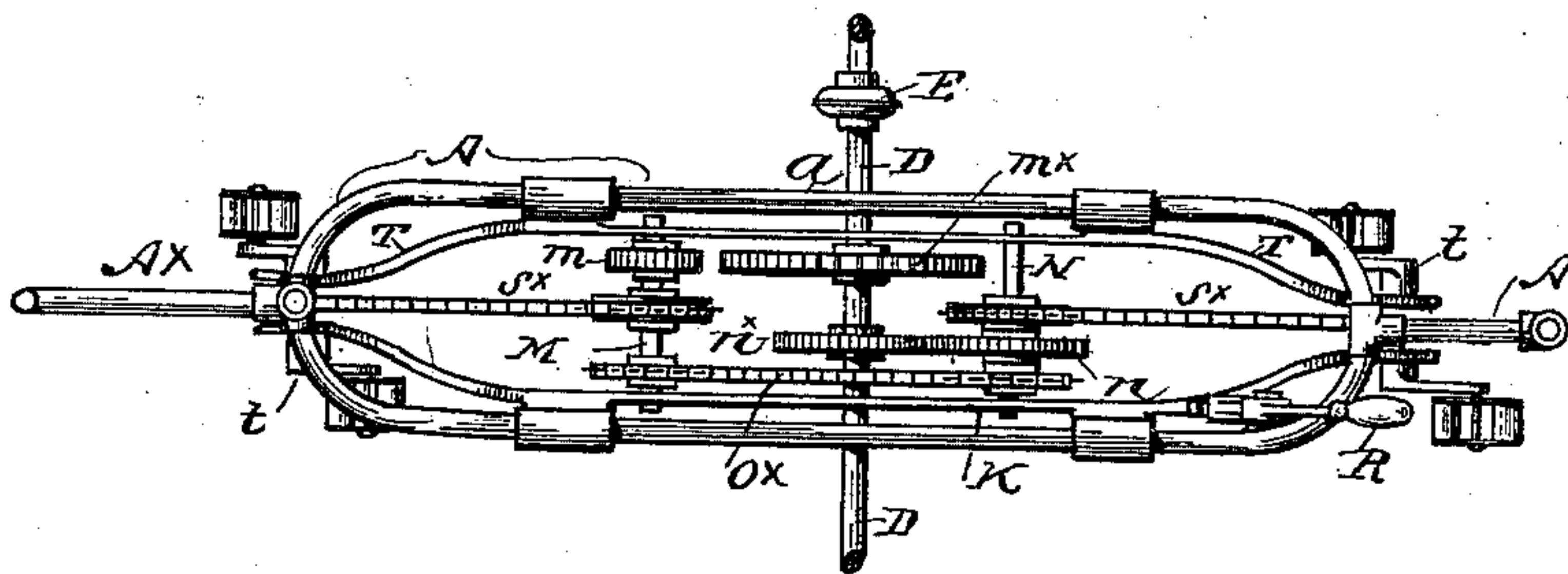


Fig. 6.



Wm H. Addicks,

WITNESSES:

John Polley Jr
F. Norman Dixon.

INVENTOR

INVENTOR
By his Attorneys,
W. C. Strawbridge
Bonsall Taylor

UNITED STATES PATENT OFFICE.

WILLIAM H. ADDICKS, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF
ONE-HALF TO J. BONSALE TAYLOR, OF SAME PLACE.

VELOCIPED.

SPECIFICATION forming part of Letters Patent No. 357,138, dated February 1, 1887.

Application filed June 23, 1886. Serial No. 206,032. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. ADDICKS, a citizen of the United States, residing in the city and county of Philadelphia, in the State of Pennsylvania, have invented an Improvement in Tricycles, of which the following is a specification.

My invention, although applicable generally to four-wheeled velocipedes and to single tricycles, is of especial applicability to tandem-tricycles or those which are propelled by two riders sitting, respectively, one ahead of the other.

My invention comprehends a driving-gearing of a special construction, which, without affecting the movement of the pedals or necessitating stoppage of the machine, is capable of adjustment to different speeds and powers, in order to adapt the machine either for rapid running upon levels or for slower but more powerful action upon ascending grades.

A tandem-tricycle embodying a good form of my improvements is represented in the first three figures of the accompanying drawings, and described in this specification, certain modified constructions, also embodying the invention, being represented in Figures 4, 5, and 6, and likewise described, the particular subject-matter claimed as novel being hereinafter definitely specified.

In the drawings, Fig. 1 is a side elevation of a three-track front-steering tandem-tricycle embodying my improvements, the driving-wheel nearest the eye being, for clearer illustration, supposed removed. Fig. 2 is a top plan view of the tricycle represented in Fig. 1. Fig. 3 is a fragmentary perspective detail of the supplemental or sliding frame shown in Figs. 1 and 2, so much of the main frame as is necessary to illustrate the relationship of the sliding frame thereto being likewise represented. Fig. 4 is a fragmentary side elevational detail of a modified construction also embodying my invention. Fig. 5 is a view similar to Fig. 4 of still another modification likewise embodying my invention, and Fig. 6 is a top plan view of the parts represented in Fig. 5.

Similar letters of reference indicate corresponding parts.

Referring now to the first three figures of

the drawings, which represent my invention as embodied in a tandem-tricycle, the driving-pedals of which act in conjunction with friction-straps and are employed to actuate clutch-containing drums or boxes of any usual pattern, but preferably of the character employed in what are known as the "star" bicycles, A is the main frame, of any desired construction and material, but preferably formed of cold-drawn weldless steel tube, and conveniently framed to consist of two parallel side bars, a , connected together by yokes a^x , and also connected with handle-carrying bars a^2 by means of transverse tie-bars a^3 , substantially as shown in Fig. 2.

A^x is the perch, which springs from the main frame—in the construction represented from the forward yoke, a^x —and carries the steering-wheel B.

The machine represented is, as stated, a three-track front-steerer; but the invention is equally applicable to a machine steering by means of a trailing wheel, and also to a machine of the two-track variety, whether the steering-wheel trails or is sprung out ahead. The invention is likewise, as also stated, applicable to a four-wheeled velocipede.

C C are the driving-wheels, both of which may be secured to the axle D, herein termed the "driving-shaft," which, in such instance, is provided with a divided gear or balance-gear, E, of any preferred construction, or one of which may, subject to the control of any usual ratchet-gear, run free upon said shaft. The axle is journaled in any preferred manner in the main frame, preferably having four ball-bearings, respectively in the side bars and handle-carrying bars.

F F are the saddles, erected upon saddle-standards f , carried by the main frame.

G are the handles, surmounting handle-standards g , conveniently carried upon the handle-carrying bars a^2 of the main frame. One of these handles, as is usual in these machines, operates a rack and pinion or other steering-gear, g^x , of any preferred construction.

The foregoing elements, or others mechanically equivalent thereto, are not novel with me.

K is what I term a "sliding" or "supplemental" frame, the same being a casting, forg-

ing, or framing of any preferred material and construction, which is adapted to slide longitudinally upon and with respect to the main frame conveniently by means of boxings k , fitted to travel upon the side bars, a , of the main frame.

The sliding frame is equipped, by the aid of suitable bearings, with two transverse shafts parallel with and respectively disposed in advance of and to the rear of the driving-shaft. Of these two shafts that one which is in front of the driving-shaft I term the "power-shaft" M , while that one which is to the rear of said driving-shaft I term the "speed-shaft" N . The power-shaft is provided with a power-pinion, m , which, subject to the movement of the sliding frame, is adapted to be engaged with what I term the "major" spur-wheel m^* , the latter being a toothed wheel, of diameter considerably in excess of that of the power-pinion, fixedly secured upon the driving-shaft. The speed-shaft is provided with a speed-pinion, n , of greater diameter than the power-pinion, which speed-pinion, subject to the adjustment of the sliding frame, is adapted to be engaged with what I term the "minor" spur-wheel n^* , which is a toothed wheel, preferably of the same diameter as the speed-pinion, fixedly secured upon the driving-shaft. The major and minor spur-wheels are, for compactness, preferably but not necessarily placed close together upon the driving-shaft; but they may be spaced sufficiently far apart to admit between them a balance-gear for said shaft. The speed and power shafts are respectively journaled in the sliding frame a sufficient distance apart, longitudinally considered, to permit, subject to the longitudinal adjustment of the sliding frame, of the engagement of either the power-pinion with the major spur-wheel, or of the speed-pinion with the minor spur-wheel, and yet to render impossible a simultaneous engagement of both pinions with both spur-wheels. The distance apart of said speed and power shafts is likewise such as, in the central position of the sliding frame, to permit of the engagement of the nether pinion with its fellow spur-wheel, in which position the driving-wheel and its connected spur-wheels run free.

The speed-shaft and the power-shaft are each provided with a sprocket-wheel, O , the two sprocket-wheels being positively geared together by a sprocket chain, O^* , and the said shafts being therefore adapted to rotate in unison. It is obvious, therefore, that rotation imparted to either the power-shaft or the speed-shaft, necessarily through the sprocket or chain gear referred to, occasions a corresponding rotation of the other shaft. It is also apparent that if the sliding frame be so adjusted as to occasion the engagement of the power-pinion with the major spur-wheel, whatever power is applied to drive either shaft will be, through the positive connection of said two shafts, transmitted through said power-pinion to said spur-wheels and thereby to the

driving-shaft, this being also the result when in the opposite position of the sliding frame the power-pinion is out of its engagement and the speed-pinion in engagement with the minor spur-wheel.

Now, the power which I employ to propel the machine is applied directly to both the power-shaft and the speed-shaft in the construction under discussion by means of strap-operated clutch-boxes P of any preferred character, but well made when of the character employed, as stated, by the manufacturers of the "star" bicycles, two of which clutch-boxes are applied to each of said shafts, a strap, p , from each box passing down to a pedal-lever, Q , fulcrumed upon a hanger, a' , depending from the main frame.

The sliding frame may be shifted endwise of the main frame to cause the engagement of either the speed or the power pinion with their respective spur-wheels by any suitable contrivance. I prefer, however, to apply a shifting lever, R , or its equivalent, to the main frame, and connect it by means of a link, r , Fig. 3, with a cross-bar, k^* , or other member of said sliding frame, the said lever being preferably disposed in advance of the rear saddle and being preferably provided with a latch or lock, r^* , engaging a toothed or notched segment, r^2 , sprung from the main frame. By means of this lever the sliding frame can be fixedly adjusted in such manner that either the power-pinion is in engagement with the major spur-wheel, the speed-pinion in engagement with the minor spur-wheel, or neither pinion in engagement.

Such being a description of a good construction of my improved gearing, it is obvious that in whichever position of adjustment the sliding frame may be all the power imparted through the pedals to either the power or the speed shaft will be transmitted through the sprocket-gearing connecting said shafts to the other shaft, so that both sets of pedals will be simultaneously potent to drive whichever pinion happens to be in engagement, and thereby, through the engaged spur-wheel, to drive the axle and road wheels.

Although I prefer to employ the strap and clutch driving devices referred to, it is obvious that other contrivances may be substituted to occasion the driving of the power and speed shafts. Thus in Fig. 4 I have represented these shafts as respectively equipped with cranks m^2 , driven by pitmen m^3 , connected with pedal-levers. Thus, also, in Figs. 5 and 6 I have represented a positive chain-gearing applied to said shafts, each of said shafts being provided with a driven chain-wheel, s , operated by chains s^* , actuated by driving chain-wheels s^2 , fixedly mounted upon pedal-shafts t , housed in pedal-brackets T , carried by and sprung downward from the sliding frame, the said pedal-shafts being equipped with the usual single-acting bicycle cranks and pedals. In this last-mentioned construction it is preferable to locate the driven chain-wheels cen-

trally with respect to the power and speed shafts, disposing the major and minor spur-wheels a corresponding distance apart.

In Fig. 5 I have also represented a shifting lever, R, provided with a toothed segment, r^3 , which is adapted to engage with a rack, r^4 , connected with the sliding frame.

It is obvious that the mechanical details of the construction of both the main frame and of the sliding frame may be almost infinitely varied, and that in the practical construction of the machine the sliding frame, herein, for clearer illustration, somewhat disproportionately magnified, may be brought within a very small compass laterally and otherwise, while the entire gearing carried by the sliding frame and contained within the compass of said frame may, if desired, be inclosed by a box or casing of any preferred character.

It is equally apparent that both the speed and the power of the gearing hereinbefore particularly described will depend not only upon the diameters of the speed and power pinions, as well as of the major and minor spur-wheels, but also upon the respective proportions of the said pinions and wheels considered each with respect to its neighbor, and by neighboring pairs with respect to each other. Such proportions as are represented in the drawings will give good results. This, however, is a matter within the province of the constructor.

It will be readily understood that my invention is applicable as well to a single tricycle as to a double or tandem machine, it being simply necessary to remove from either the speed or the power shaft all pedal-driven devices, and to omit the seat and pedals which operate in connection with said shaft from which such devices are so omitted.

The movement of the sliding frame, being end for end with the main frame, of course occasions the engagement of the teeth of the pinions and spur-wheels simultaneously as to their entire breadth, thus preventing the danger of chipping off the corners of the teeth as in sliding gears in which the shifting is sidewise.

I am aware that I am not the first to provide a tricycle or velocipede with speed and power gearings, broadly as such, and therefore to these gearings, broadly, I lay no claim; but

What I do claim, and desire to secure by Letters Patent, is—

1. The combination of a driving-shaft, upon which are mounted spur-wheels of different diameters, a movable frame-work in which are mounted pinions positively rotated in unison from the operation of the pedals, and so disposed that but one can be engaged at a time with a spur-wheel on the driving-shaft, and suitable means for moving said frame-work to at will cause the engagement of either of said pinions with its corresponding spur-wheel, substantially as described.

2. In a tricycle or velocipede, the following

elements, in combination: a main frame in which is fixedly journaled the driving-shaft of the road-wheels, two toothed wheels of different diameters fixedly mounted upon the driving-shaft, a supplemental frame adapted to have a movement at right angles to the driving-axle, two shafts journaled in said sliding frame parallel with the driving-shaft, a positive connection between said axles by means of which they rotate in unison, a pinion on one of said axles adapted to engage with one of the spur-wheels upon the driving-shaft, a pinion on the other of said axles adapted to engage with the other spur-wheel on the driving-shaft, means for moving the supplemental frame so as either to occasion the engagement of one or the other of its pinions with its fellow spur-wheel or else to so maintain the frame that neither of its pinions is in said engagement, and pedal-operated driving devices applied to one or both of the said shafts of said supplemental frame, substantially as set forth.

3. In a tricycle or velocipede, the following elements, in combination: a main frame in which is fixedly journaled the driving-shaft of the road-wheels, two toothed wheels of different diameters fixedly mounted upon the driving-shaft, a supplemental frame adapted to have a movement at right angles to the driving-axle, two shafts journaled in said sliding frame parallel with the driving-shaft, a positive connection between said axles by means of which they rotate in unison, a pinion on one of said axles adapted to engage with one of the spur-wheels upon the driving-shaft, a pinion on the other of said axles adapted to engage with the other spur-wheel on the driving-shaft, means for moving the supplemental frame so as either to occasion the engagement of one or the other of its pinions with its fellow spur-wheel or else to so maintain the frame that neither of its pinions is in said engagement, two clutch-containing boxes or drums applied to each of the shafts of the supplemental frame, friction-straps applied to said boxes or drums, and pedals for actuating said straps, substantially as set forth.

4. The combination of a driving-shaft upon which are mounted spur-wheels of different diameters, a movable frame-work in which are mounted pinions of different diameters adapted to be positively operated from the operation of the pedals, means for driving said pinions simultaneously in the same direction, and suitable means for moving said frame-work so as to bring either of its pinions into engagement with its fellow spur-wheel on the main shaft, substantially as described.

5. In a tricycle, a main frame, a driving-shaft upon which are mounted toothed spur-wheels of dissimilar diameters, a sliding frame, two minor shafts journaled in said sliding frame, respectively, a suitable distance to the front and to the rear of the driving-shaft, and adapted to be positively rotated in unison from

the pedals by a sprocket-chain connection, a pinion fixed on each of said minor shafts and facing one of the spur-wheels on the driving-shaft, and suitable means for moving said sliding frame endwise of the main frame, so as to bring one of its positively-driven pinions into and the other out of engagement with its fellow spur-wheel on the driving-shaft, substantially as described.

In testimony whereof I have hereunto signed in my name this 21st day of June, A. D. 1886.

WILLIAM H. ADDICKS.

In presence of—

J. BONSAILL TAYLOR,

WM. C. STRAWBRIDGE.