

No. 713,731.

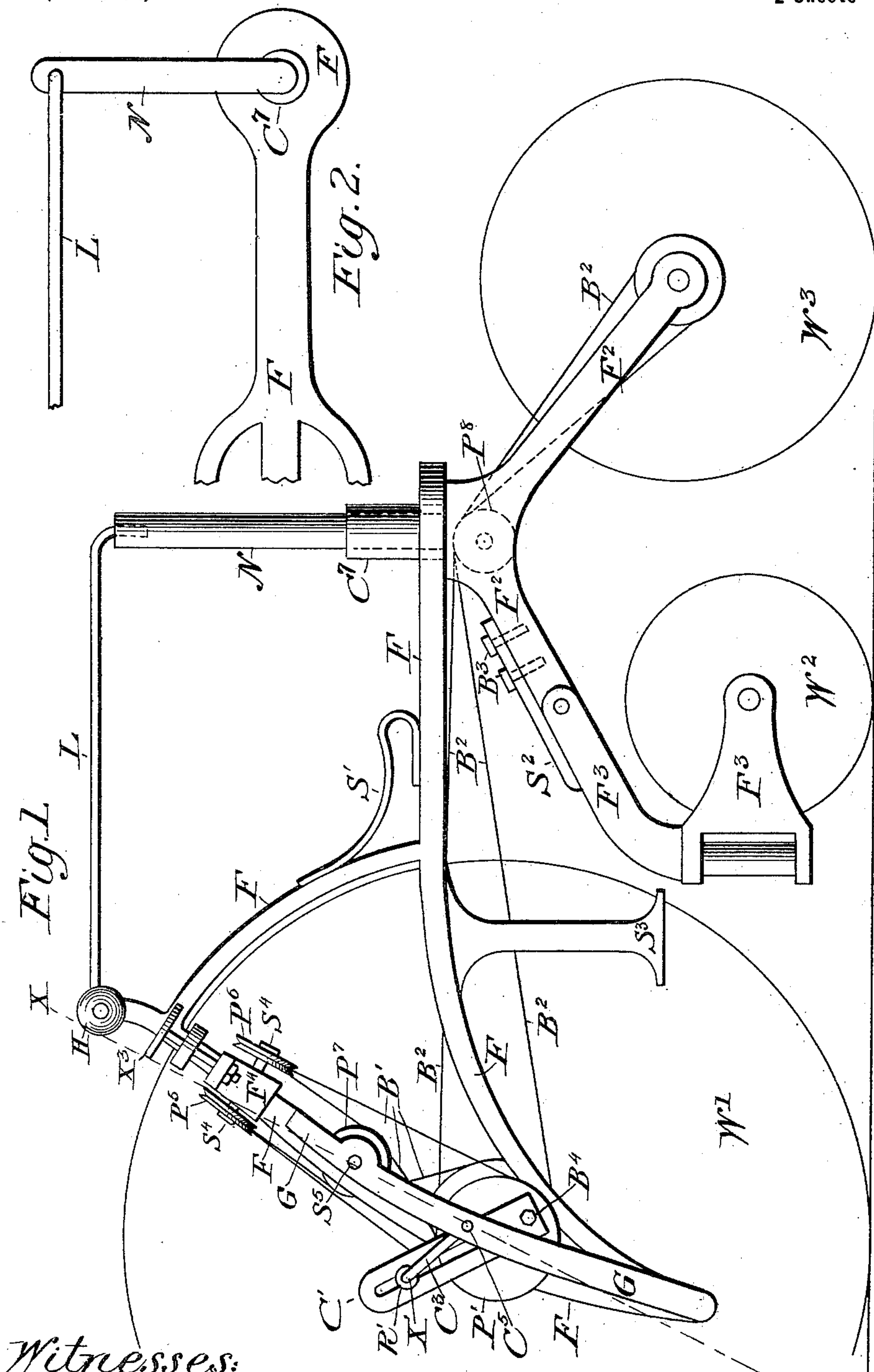
Patented Nov. 18, 1902.

A. M. ALLEN.  
VELOCIPÈDE.

(Application filed June 16, 1897.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:

D. W. Edlin  
Chas. H. Baker.

Inventor:

Arthur M. Allen

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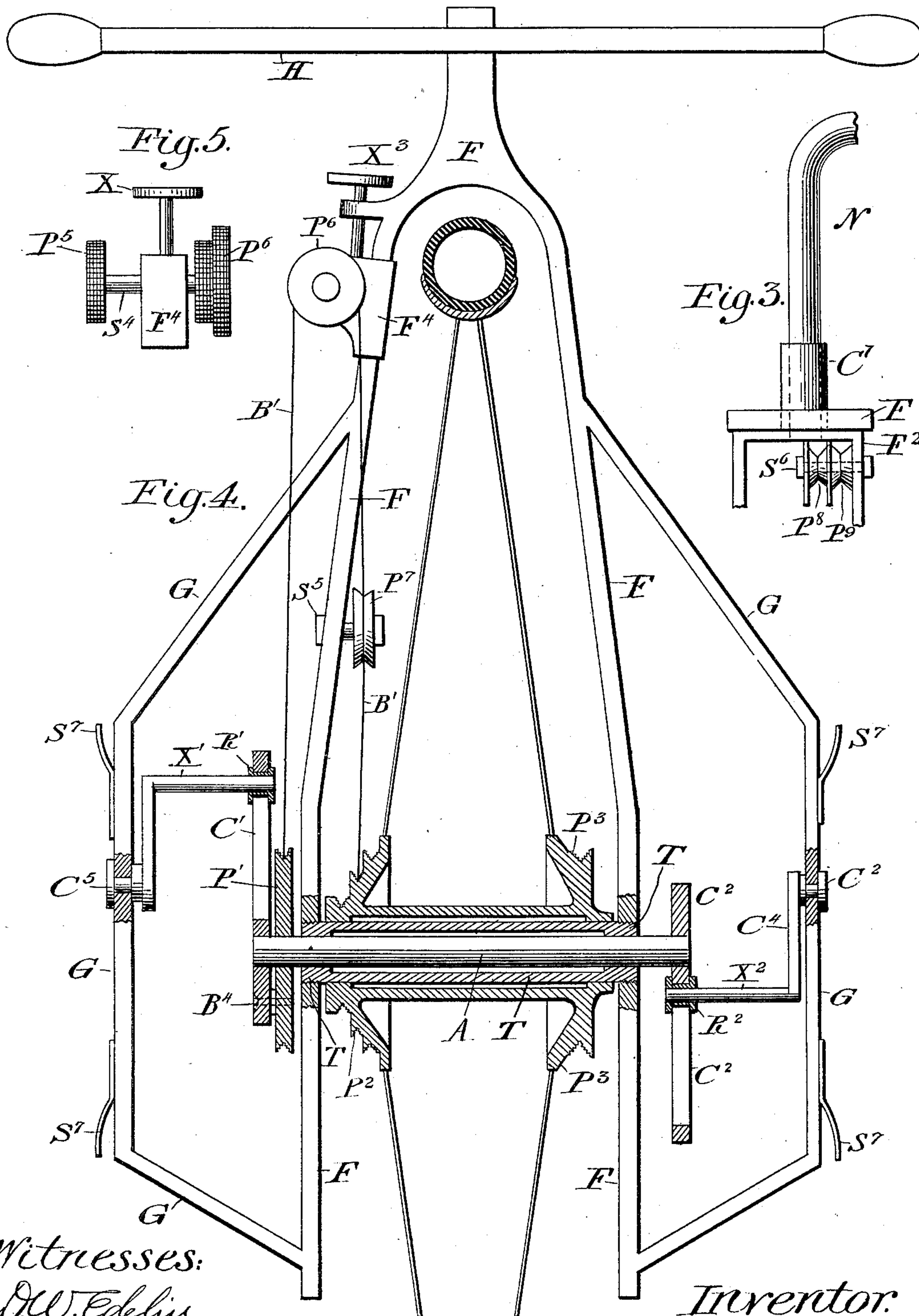
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# UNITED STATES PATENT OFFICE.

ARTHUR M. ALLEN, OF WEST NEW BRIGHTON, NEW YORK.

## VELOCIPED.

SPECIFICATION forming part of Letters Patent No. 713,731, dated November 18, 1902.

Application filed June 16, 1897. Serial No. 641,060. (No model.)

*To all whom it may concern:*

Be it known that I, ARTHUR M. ALLEN, a citizen of the United States, and a resident of West New Brighton, Richmond county, New York, have invented a new and useful Improvement in Velocipedes, of which the following is a specification.

My invention relates to improvements in velocipedes with three wheels in line. The middle one is a caster-wheel which, with the one behind it, is arranged in one frame and both used at once to steer. They turn out on opposite sides, and thereby provide three points (not in line) for support while steering, whereby the vehicle can stand upright alone, is easy to learn, and safe to use.

It also relates to an improved construction of the axle and driving connection of both front and rear wheels by one rider, so that the position of the seat will not vary the road-grip of the wheels.

I attain these results by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the velocipede. Fig. 2 is a plan of the steering-gear. Fig. 3 is a vertical section of back frame at the pivot, showing intermediate pulleys. Fig. 4 is a cross-section of Fig. 1 on line *xx*. Fig. 5 shows variation in position of stud-frame with intermediate pulleys in front frame.

Similar letters refer to similar parts throughout the several views.

This velocipede is directly propelled by the front wheel, which by a flexible connection drives the rear wheel also. The frame supported by this front wheel and axle has a seat close behind and low enough to obtain an oblique forward tread on the axle-cranks. The steer-post is behind the rider, passing above the frame, bent to one side, and connected by a link to the steer-bar arranged on a pivot on the front frame before the rider. On each side of the front frame is an extension or outside loop about three feet high and eight inches wide to support the journal of a pedal-crank at a point about three inches higher than the axle. The inside end of this crank-pin rests in a roller which travels out and in from and to the center of a slotted crank fixed on the axle, and in action is a slow forward and quick return with greater

power on the live-center, and keeps the circular path for the foot. The front axle is double. A tube is fixed in the frame sides. On this tube the front wheel is mounted, with a cone of gears or belt-grooves on one side and a single one on the other. Inside this tube the driving-axle is mounted, with a crank and gear or pulley fixed on one end and a crank on the other. The belt or chain from this pulley passes over two guide-pulleys on studs in a frame near the top of the front frame and down to the groove-cone on the road-wheel. As this belt has to cross to drive forward, another guide-pulley is set half-way up in the frame. The driving-surfaces of the pulleys are cut into pyramid-points, as shown in my patent of January 29, 1895, No. 533,405, whereby a slack belt may have a good hold. Plain journals only are shown here; but rollers or ball-bearings may be used where desired. A screw above the stud-frame adjusts the belt tension or allows it to be changed to another groove in the cone to change the gear of the velocipede. For chains the stud-frame is turned, so that the wheels are parallel to the pulleys below and two chains used, one inside and the other outside of the frame. A shaft and two fixed pulleys are then used instead of two loose pulleys and fixed studs. Two other guide-pulleys are mounted on a stud in the hind frame close under the neck to keep the belt or chain which connects the front and rear wheels in line while steering. Springs are fixed on the outside of the side loops or frame to protect the pedal-cranks in case of a fall.

In the drawings tube T, with a right and left thread cut on its ends, is placed in the hub of wheel W' and between the holes in frame F. It is then screwed tight by a drift-pin and becomes a part of frame F, with wheel W' mounted on it. (See Fig. 4.) Axle A, with slotted crank C' and pulley P' secured on one end and by bolt B<sup>4</sup>, is then passed through tube T and slotted crank C<sup>2</sup> secured on the other end. (See Fig. 4.) On the side extension G of frame F, about three inches above the axle-center, two other and shorter cranks C<sup>3</sup> C<sup>4</sup> are pivoted by pivots C<sup>5</sup> C<sup>6</sup> and whose pins X' X<sup>2</sup> rest in rollers R' R<sup>2</sup> in the slots in cranks C' C<sup>2</sup>, making a slow forward and quick return. Guide-pulleys P<sup>5</sup> P<sup>6</sup> (see



Figs. 1 and 4) are mounted on studs  $S^4$  in a frame  $F^4$  near the top of frame  $F$ , and another guide-pulley  $P^7$  is mounted on a stud  $S^5$  in the frame  $F$  between frame  $F^4$  and axle  $A$ .  
 5 A belt  $B'$ , passing over pulleys  $P^5$ ,  $P^6$ , and  $P^7$ , connects axle-pulley  $P'$  to road-wheel cone  $P^2$  and drives. If gears and chains are used, pulley-frame  $F^4$  is arranged as shown in Fig. 5 and two chains used instead of one belt.  
 10 Above pulley-frame  $F^4$  is an adjustable screw  $X^3$ , which tightens the belt or chains or allows them to be arranged in different diameters of the road-wheel cone to change the gear. The back frame  $F^2$  is forked behind to inclose the  
 15 third wheel  $W^3$  (see Fig. 1) and single in front where the caster-frame  $F^3$  is attached, inclosing middle wheel  $W^2$ . This single part of frame  $F^2$  is jointed and has a spring  $S^2$  secured to it by bolts  $B^3$  to allow for longitudinal unevenness of the road. The frame  $F^2$   
 20 has a pivot or neck  $N$ , (see Fig. 1,) fitted in a sleeve which is fixed in the rear of frame  $F$ . This neck  $N$  is bent over sidewise and connected to a steering bar or handle  $H$  on  
 25 the frame  $F$  by a link  $L$ . The seat  $S$  is arranged on the frame  $F$  behind the handle  $H$  at such a height as to require an oblique forward tread on the cranks  $C^3$   $C^4$ . (See Figs. 1 and 4.) Belt  $B^2$  on wheel-pulley  $P^3$  passes  
 30 over two guide-pulleys  $P^8$   $P^9$  and around back-wheel-hub pulley  $P^4$ , thereby propelling the

back wheel also. A step  $S^3$  (see Fig. 1) assists to reach the seat. Four springs  $S^7$  on the corners of frame extensions  $G$  serve to protect the cranks  $C^3$   $C^4$  from injury by falling. 35

What I claim as new, and am desirous of securing by Letters Patent, is—

1. In a wheeled vehicle, two frames, the one with a transverse axle and a steering-head, and the other with two transverse axles, one behind the other, and a frame-neck to fit said steering-head, all in combination with three road-wheels in line and driving and steering gear. 40

2. In a wheeled vehicle, a front frame, a 45 road-wheel arranged between and supporting its sides, a pivot in the rear of said frame, a hind frame provided with a neck to fit said pivot, and with bearings for two more road-wheels, one behind the other, and all arranged 50 in line, to provide three points not in line for support of the vehicle, while steering, by turning the neck of the hind frame.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 27th day of May, 1897. 55

ARTHUR M. ALLEN.

Witnesses:

ROBERT SCHALKENBACH,  
JAMES WEIR.