(No Model.) 2 Sheets—Sheet 1.

I. A. WESTON & W. A. SMITH.

VELOCIPEDE.

No. 357,110. Patented Feb. 1, 1887.

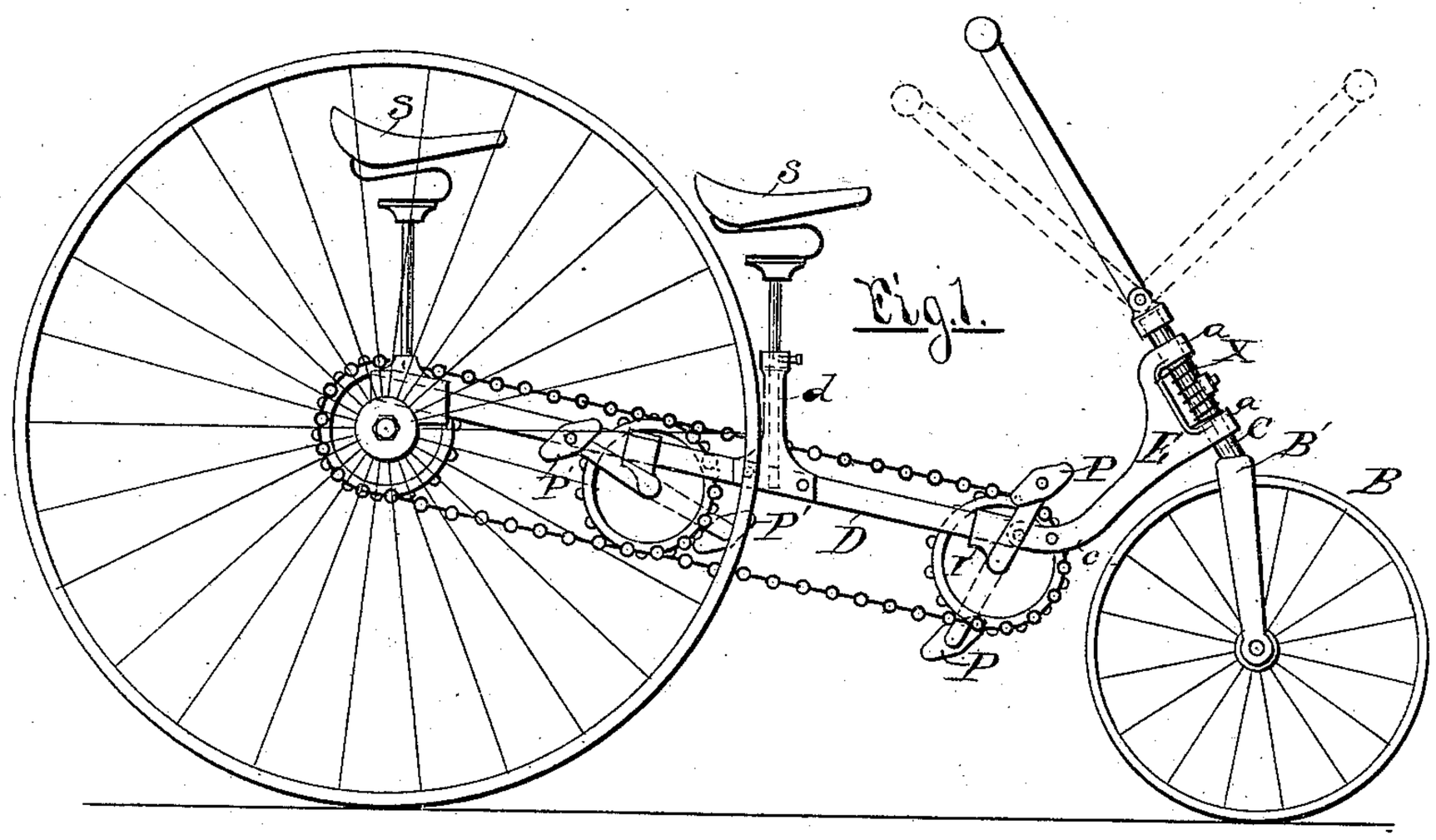

Fig. 1.

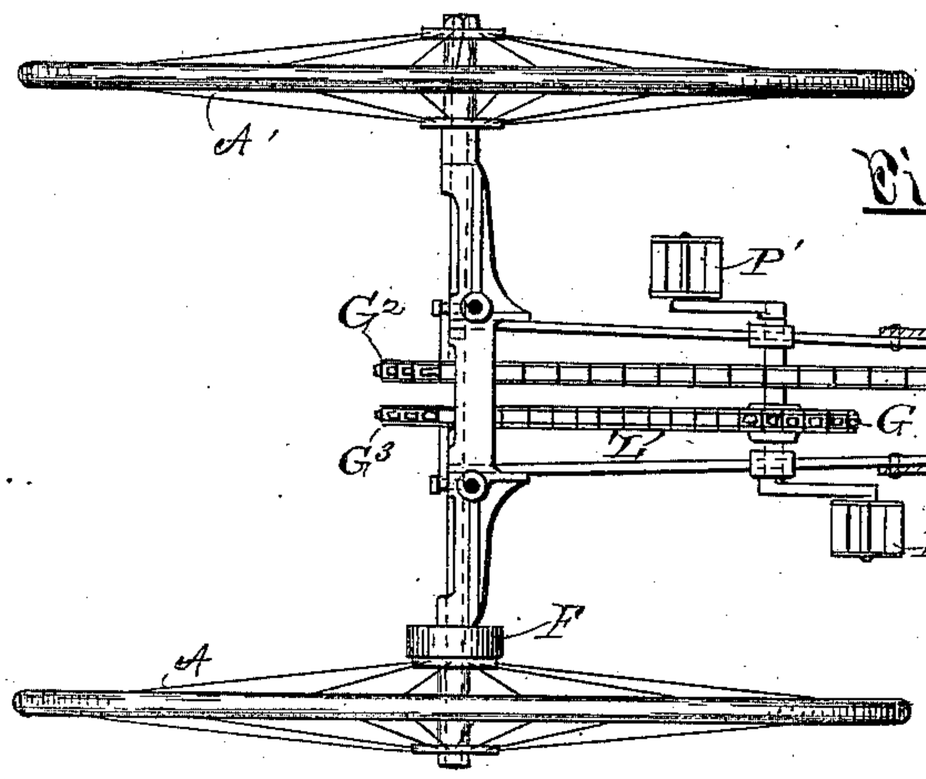

Fig. 2.

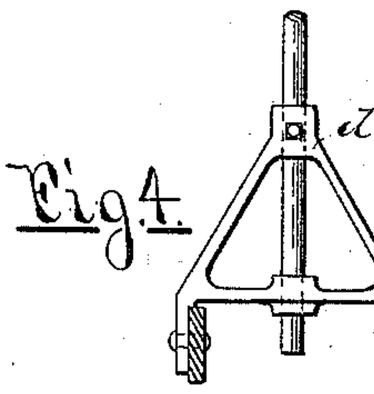

Fig. 4.

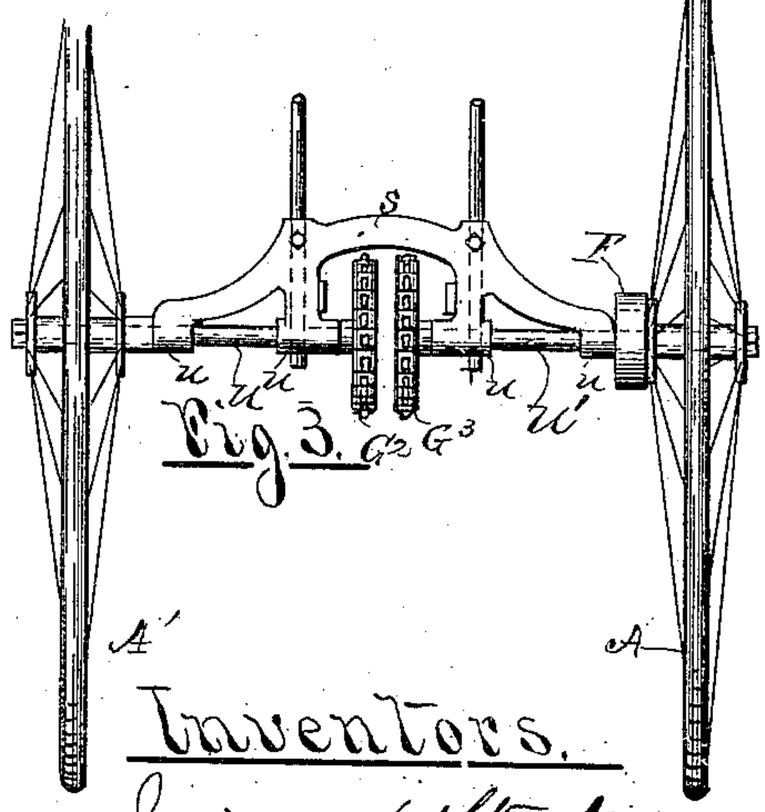

Fig. 3.

Witnesses.

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Attys

(No Model.) 2 Sheets—Sheet 2.

I. A. WESTON & W. A. SMITH.

VELOCIPEDE.

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Fig 5.

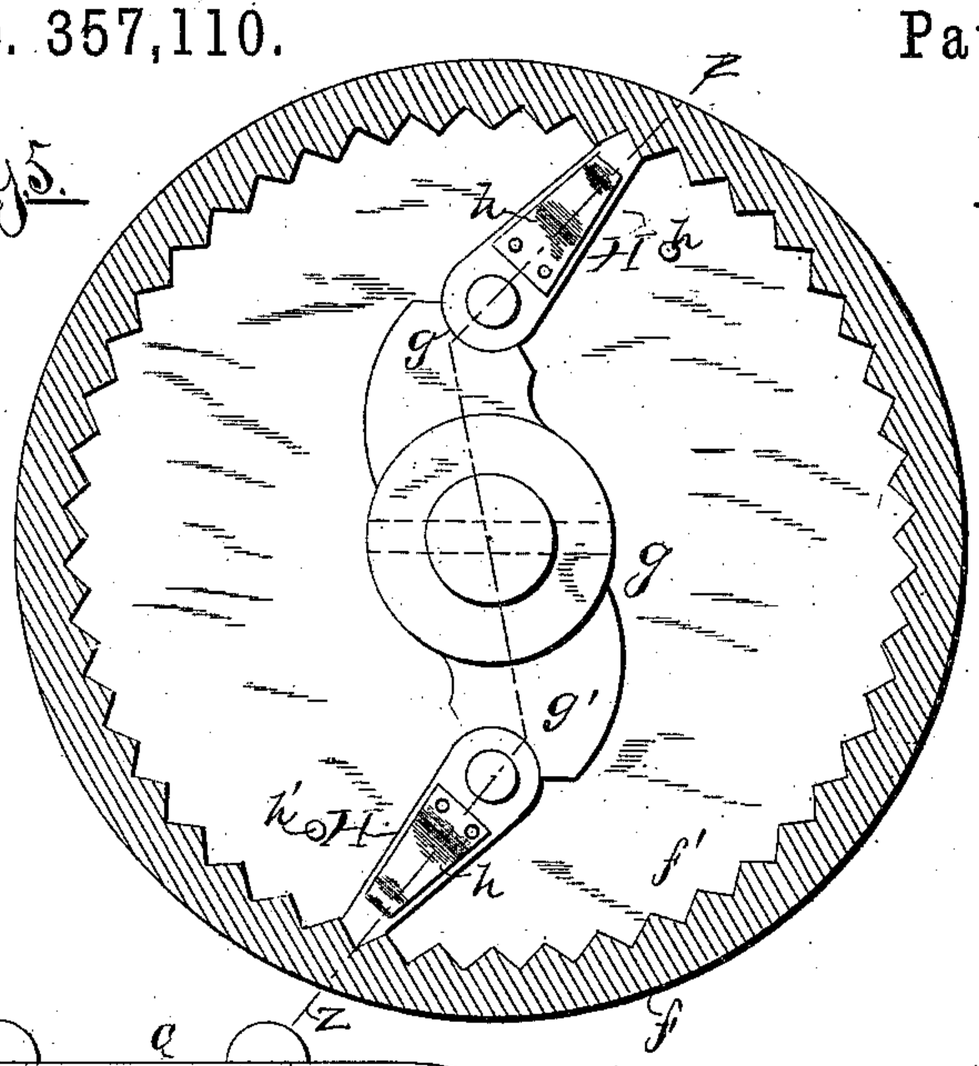

Fig 6.

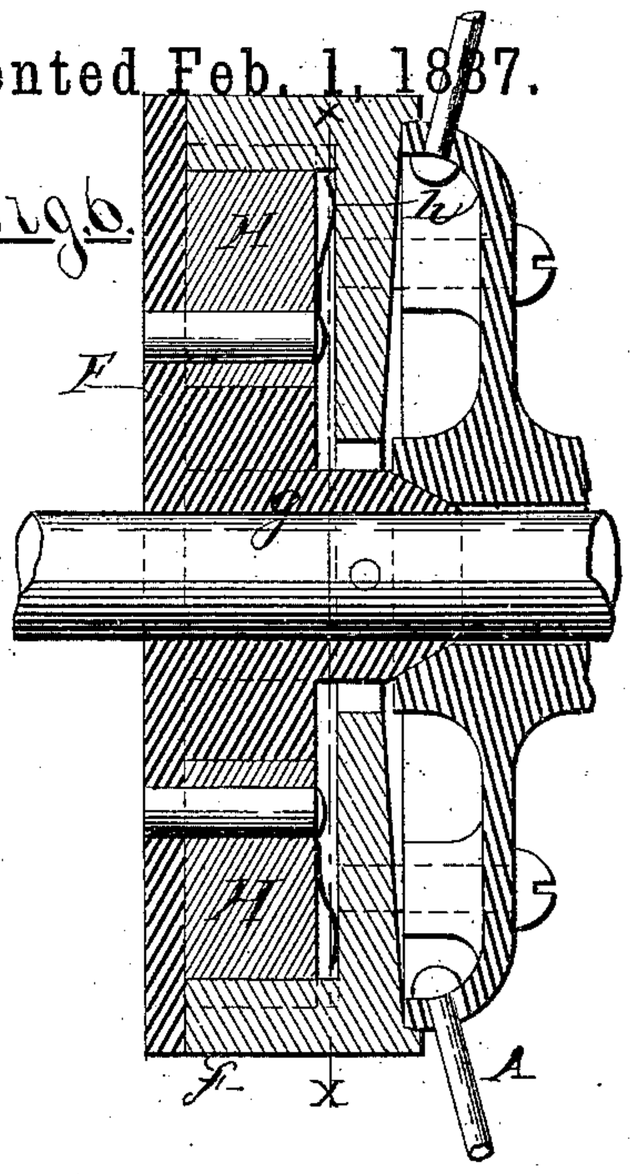

Fig 7.

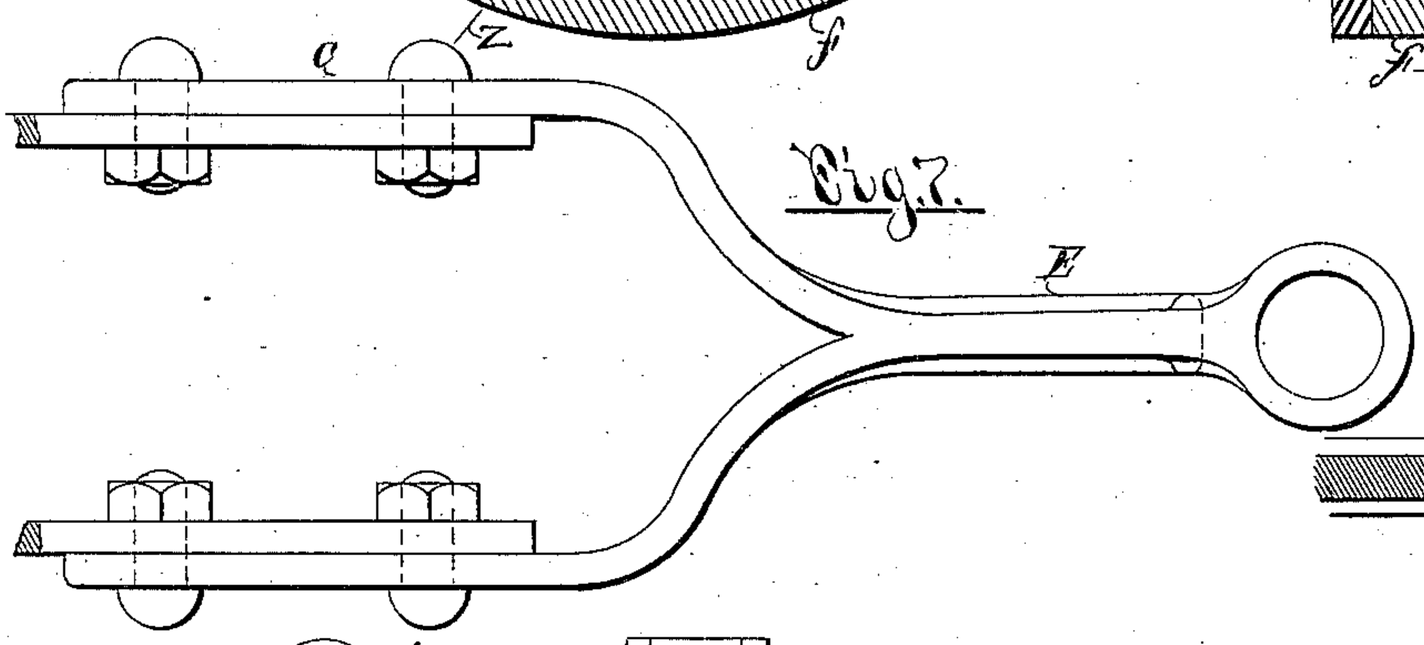

Fig 9.

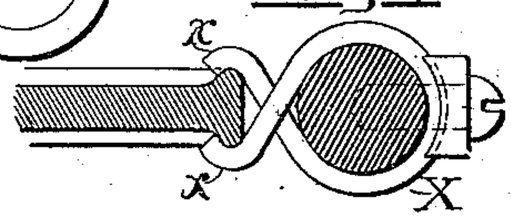

Fig 10.

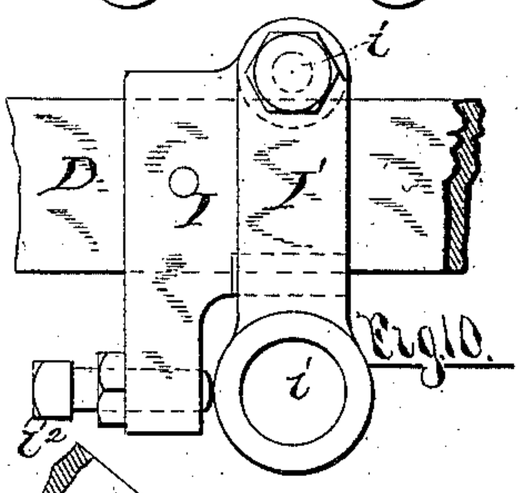

Fig 11.

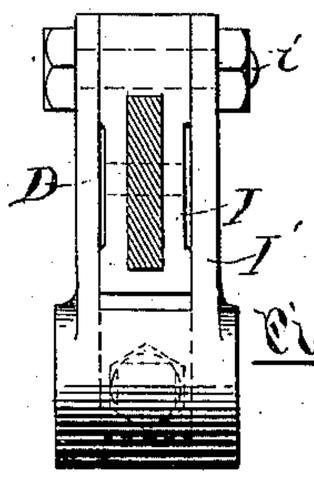

Fig 8.

Witnesses.

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by Hey & Dibb Attys.

UNITED STATES PATENT OFFICE.

IRVING A. WESTON AND WILLARD A. SMITH, OF SYRACUSE, NEW YORK.

VELOCIPEDE.

SPECIFICATION forming part of Letters Patent No. 357,110, dated February 1, 1887.

Application filed October 4, 1886. Serial No. 215,220. (No model.)

To all whom it may concern:

Be it known that we, IRVING A. WESTON and WILLARD A. SMITH, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Tricycles, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

Our invention relates to an improvement in tricycles, the object being to provide means for guiding the steering-wheel normally rectilinearly and cushioning the front end of the machine, for connecting two sets of independently-moving actuating devices to the frame or support between the steering-wheel and drivers, for diverging side bars connecting the goose-neck to the axle-support and actuating mechanism, for a noiseless and automatic ratchet which permits the drivers, or one of them, to turn independently when the machine turns a corner, and to connect the same and transmit motion from the actuating devices when the machine goes ahead, for an adjustable securing device which permits the link-belt to be adjusted readily, and certain other functions and advantages in the operation of this type of vehicles, as hereinafter explained.

With these ends in view our invention consists in certain features of construction and combinations of parts, as will be hereinafter described, and pointed out in the claims.

In the accompanying drawings, in which like letters indicate corresponding parts in all the views, Figure 1 is a side view of a tricycle embodying our improvement, and illustrating the general arrangement of the parts. Fig. 2 is a top plan of the same, showing the diverging side bars connected to the goose-neck and axle-support and the two sets of independently-moving actuating devices connected to the said side bars, the rear seat being removed and the front-seat supports being in section. Fig. 3 is an end view taken back of the drivers, showing the axle-support, divided axle, and noiseless automatic clutch. Fig. 4 is a detached detail of the front-seat support. Fig. 5 shows an enlarged section, taken on line *x x*, Fig. 6, of the noiseless automatic clutch. Fig. 6 is an enlarged section of the noiseless automatic clutch taken on line *z z*, Fig. 5, showing the relative arrangement of the parts. Fig. 7 is an enlarged detached plan of the bifurcated goose-neck, showing the manner of attaching the side bars thereto. Fig. 8 is an enlarged detached detail of the goose-neck, illustrating the improved means for guiding the steering-wheel rectilinearly normally and cushioning the front end of the machine. Fig. 9 is a section of the same, taken on line *y y*, Fig. 8. Fig. 10 shows an enlarged detail of the adjusting device for tightening the link-belt; and Fig. 11 shows a front end view of the same, also enlarged.

A A′ are the driving-wheels. B is the guide-wheel, the drivers being journaled in bearings *u u* formed in the axle-support *s*, Fig. 3, said drivers being mounted upon independent or divided axle U U′. The guide-wheel B is supported in the yoke-frame B′, and the stem of the spindle C is journaled in the guide eyes or sockets *a a* of the neck E, Fig. 1, the stem C turning freely in its support.

The neck E we preferably construct as illustrated in Figs. 1 and 7, and may be termed a "bifurcated goose-neck" formed from one piece of metal. To the arms *c c* of the said neck E we secure the diverging side bars, D D, and upon these side bars we secure the front-seat supports *d d*, Fig. 2, and the two sets of independently-moving actuating mechanisms, comprising the pedals P P′, sprocket-wheels G G′, and sprocket-wheels G^2 G^3, secured to the divided axle, as shown in Fig. 3, and the link-belts L L′, the said side bars, D D, being connected with the axle-support *s*, as shown at Figs. 1 and 2 aforesaid.

In order to guide the steering-wheel normally in a straight line, we provide a spiral, X, secured to the stem of the steering-wheel yoke, as best shown at Fig. 8 of the drawings, the said spiral being fastened about midway its length to the stem, leaving its free ends bearing upon opposite sides of the neck, as best shown at Fig. 9. Thus the tension of the spring is exerted upon each side of the neck equally, which tends to guide the steering-wheel rectilinearly, and at the same time the spiral forms a cushioning device, which enables the steering-wheel and front end of the machine to pass an obstruction and yield readily thereto without jolting the operator.

F is the noiseless automatic clutch, composed

of the case or shell *f*, secured to the hub of the driver A, and the circular disk *g*, secured to the axle U. The shell *f* is circular in shape and is provided on its internal periphery with fluted or parallel serrations *f'*, as shown at Fig. 5. The disk *g* is provided with curved seats *g'* for the dogs H H, and the dogs H H are pivoted in the curved seats, the free end engaging the serrations of the shell or case *f*. Springs *h h* are secured to the sides of the dogs H, and bear against the shell or case *f* with sufficient pressure to prevent rattling, and stops *h'*, Fig. 5, restrict the movement of the dogs when the wheel to which the clutch is applied moves in a reverse direction.

It will be observed that when power is applied to the wheel carrying the clutch to propel it forward the dogs H engage the serrations *f'* of the shell *f*, which is secured to the wheel, locking the wheel securely to the shaft or axle U by means of the dog-carrying disk *g*, secured to the axle, and thereby the said driver is propelled forward by the actuating mechanism driven from the pedal, the said dogs H H and their stops *h'* being reversely arranged on opposite sides of the center.

Now when it is desired to turn the machine, simply reversing the action of the pedals P permits the dogs H to slide back to the stops *h'*, thus disengaging from the serrations in *f*, which liberates the driver A and permits the same to turn independently of the opposite driver and allowing the machine to turn corners freely, while the stops *h'* prevent the dogs from being thrown too far out of position. The springs *h* on the dogs also serve to keep the dogs in frictional contact with the case or shell *f*, and when the power is applied to start the machine ahead the dogs H move into engagement with the serrations in *f*, and thus lock the wheel to the axle, as previously described.

The axle-support *s* is best shown at Fig. 3, and has the bearings *u u* for the divided axle, and is connected, as already described, to the neck E, Fig. 1, by bars D.

Where two independent sets of actuating mechanism are employed, the rear seat S, Fig. 1, is mounted on the axle-support, as shown in Fig. 3. The front seat S is mounted on a frame, *d*, constructed as shown in the detached detail, Fig. 4, the seat-support being adjustable vertically.

In order to take up the slack in the link-belt L L', we connect the forward sprocket-wheels, G G', to the supporting-frame D, as best shown at Figs. 10 and 11.

The stirrup I', carrying the journal *i'* of the pedal-crank, is pivoted to the support I at *i*, said support I being bolted or otherwise secured to the supporting-frame D of the machine. A set-screw, i^2, bearing against the journal-bearing of the pedal-crank and sprocket-wheel, serves to adjust the sprocket-wheel, so as to tighten the link-belt when desired.

The side bars, D D, as will be observed, are secured at an angle with each other to the goose-neck and axle-support, for the purpose of making a strong and stiff frame with a minimum amount of weight therein. The divergence of the bars has a tendency to greatly strengthen the construction, and the said side bars form a connecting frame or support between the steering-wheel and drivers, upon which the actuating mechanism is supported, as already stated.

The advantage accruing from the employment of two sets of independently-moving actuating devices in connection with the divided axle arises from the fact that the machine can be driven tandem by two operators, and the turns can be readily made by disconnecting one wheel from the use of the automatic clutch without stopping the machine, and it is obvious that the clutch can be applied to both wheels and either of the drivers released at the will of the operator.

Our improved construction of the device for guiding the steering-wheel normally in a straight line is equally applicable to tricycles in which but one set of actuating mechanism is employed, and so, also, is the take-up device for tightening the link-belt L, and two of the herein-described automatic noiseless clutches may be used in the same tricycle attached to the drivers, as previously described.

The operation of the machine with our invention applied thereto will be readily understood from the foregoing.

The steering-wheel is guided normally in a straight line by means of the equalizing-spring, and cushioned forward, as explained.

When driven tandem by two operators, and but one clutch is used, the machine is turned by backing the pedals connected to that part of the divided axle which carries the clutch.

We are aware that clutches having internal racks and spring-pawls have been used in connection with foot-levers for propelling velocipedes; hence we do not broadly claim such devices.

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

1. The neck E, for supporting the steering-wheel stem, provided with a guide-eye through which said stem passes, a spiral spring mounted on the stem and secured at about midway its length thereto, and the upper and lower ends of the spring bearing against opposite sides of the neck to guide the steering-wheel normally in a straight line and to cushion it in passing obstructions, substantially as specified.

2. The combination, with the bifurcated neck E, of the diverging side bars, D, connected to the arms *c* of the neck E at one end and to the axle-support at the other end, and actuating means, substantially as described, secured to the diverging side bars, substantially as and for the purpose set forth.

3. The combination, with the bifurcated neck E, of the diverging side bars, D, con-

nected to the arms *c* of the neck E and to the axle-support, the independently-moving actuating means, substantially as described, secured to the diverging side bars, and the divided axle, substantially as and for the purpose set forth.

4. The combination, in a tricycle, of two independent sets of actuating devices secured to the frame between the steering-wheel and drivers and located relatively near the axle-support and the forward end of the tricycle, and seats for the riders in convenient proximity to the treadles of the actuating devices, substantially as and for the purpose set forth.

5. In a tricycle, the combination of the driving-wheels, connecting-frame, actuating mechanism, steering-wheel frame, and spring X, the spring X being mounted on the stem of the steering-wheel and secured thereto about midway its length, and the opposite ends of the spring bearing against opposite sides of the steering-wheel frame, substantially as and for the purpose set forth.

6. In a tricycle, the automatic clutch F, comprising the section *f*, secured to the driver A, and the dog-carrying section *g*, secured to the axle U, the dogs H H, pivoted to *g* in the grooved seats *g'*, provided with the springs *h*, and the stops *h'* in the section *f*, substantially as and for the purpose set forth.

7. In a tricycle, the combination of the driving-wheel A with the herein-described clutch F, sprocket-wheels G G, link-belt L', and pedal P', substantially as and for the purpose set forth.

8. In a tricycle, the combination, with the frame D, of the support I, pivoted stirrup I', set-screw i^2, and the pedal-crank, all substantially as and for the purpose set forth.

9. The combination of the bifurcated neck E, having the guide-spring X, the side bars, D, connected, respectively, to the arms *c* of the neck, and to the axle-support, and the sprocket-wheels, link-belt, and treadle, substantially as and for the purpose set forth.

10. The combination, in a tricycle, of independently-moving actuating devices mounted one in advance of the other on the tricycle-frame, seats for the riders, and a steering-wheel having a cushioning device, substantially as and for the purpose set forth.

11. The combination, in a tricycle, of independently-moving actuating devices mounted one in advance of the other on the tricycle-frame, seats for the riders, and a steering-wheel having a device for guiding it normally rectilinearly, substantially as and for the purpose set forth.

12. The combination, in a tandem-tricycle for two operators or riders, of two driving-wheels having independently-moving actuating means, with treadles for each set of actuating means, whereby either operator or rider may actuate one driving-wheel independent of the other, substantially as and for the purpose set forth.

13. The combination of the drivers A A', divided axle U U' sprocket-wheels G G, link-belts L L', treadles P P', connecting-frame D D, and steering-wheel B, substantially as and for the purpose set forth.

In testimony whereof we have hereunto signed our names, in the presence of two attesting witnesses, at Syracuse, in the county of Onondaga, in the State of New York.

IRVING A. WESTON.
WILLARD A. SMITH.

Witnesses:
M. J. DOLPHIN,
F. H. GIBBS.