(No Model.) 3 Sheets—Sheet 1.

F. MALFAIT.

VELOCIPEDE.

No. 456,625. Patented July 28, 1891.

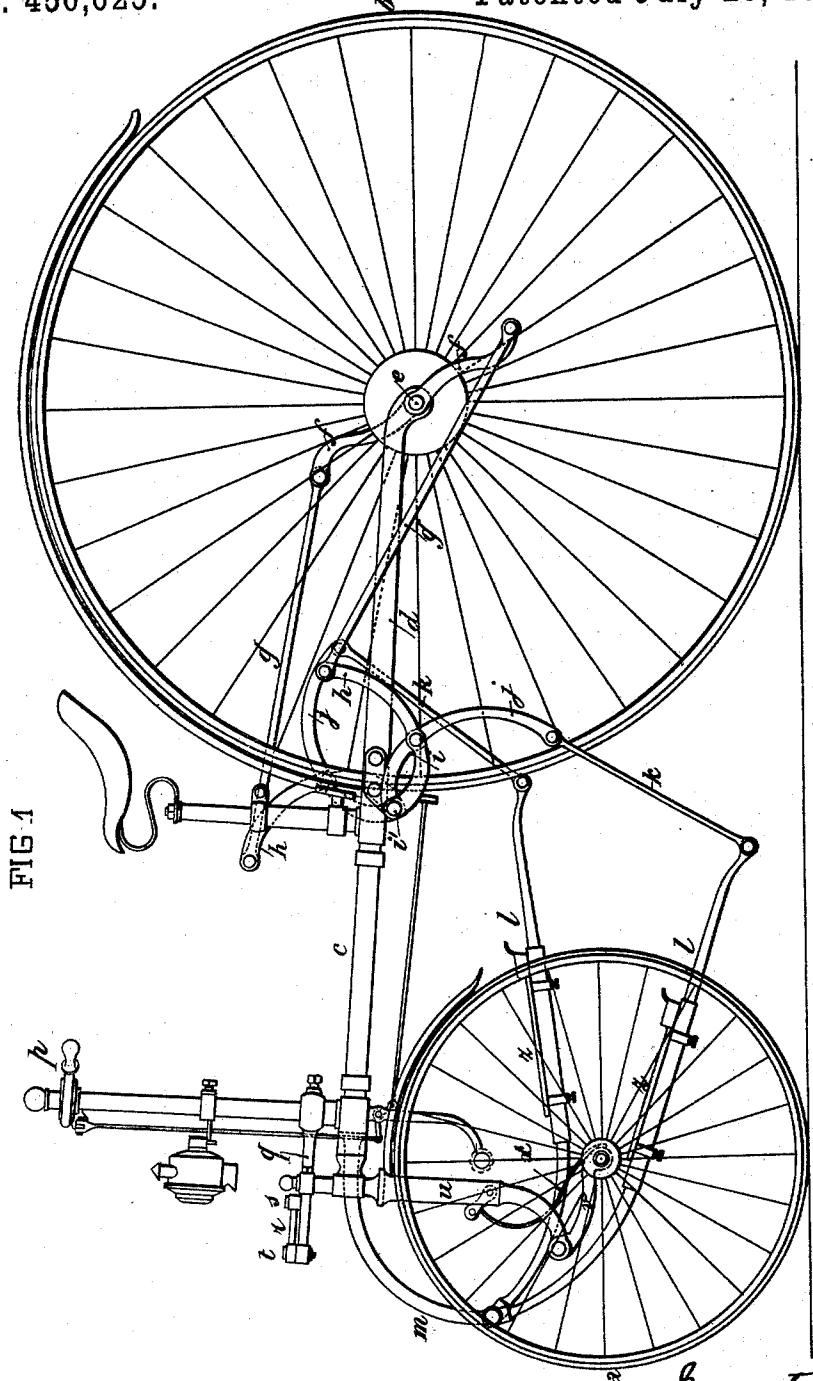


FIG 1

Witnesses,
R. C. Whitehead
H. E. Everding.

Inventor,
Frederic Malfait
by Briesen & Knauth
his Attorneys.

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(No Model.) 3 Sheets—Sheet 2.

F. MALFAIT.

VELOCIPEDE.

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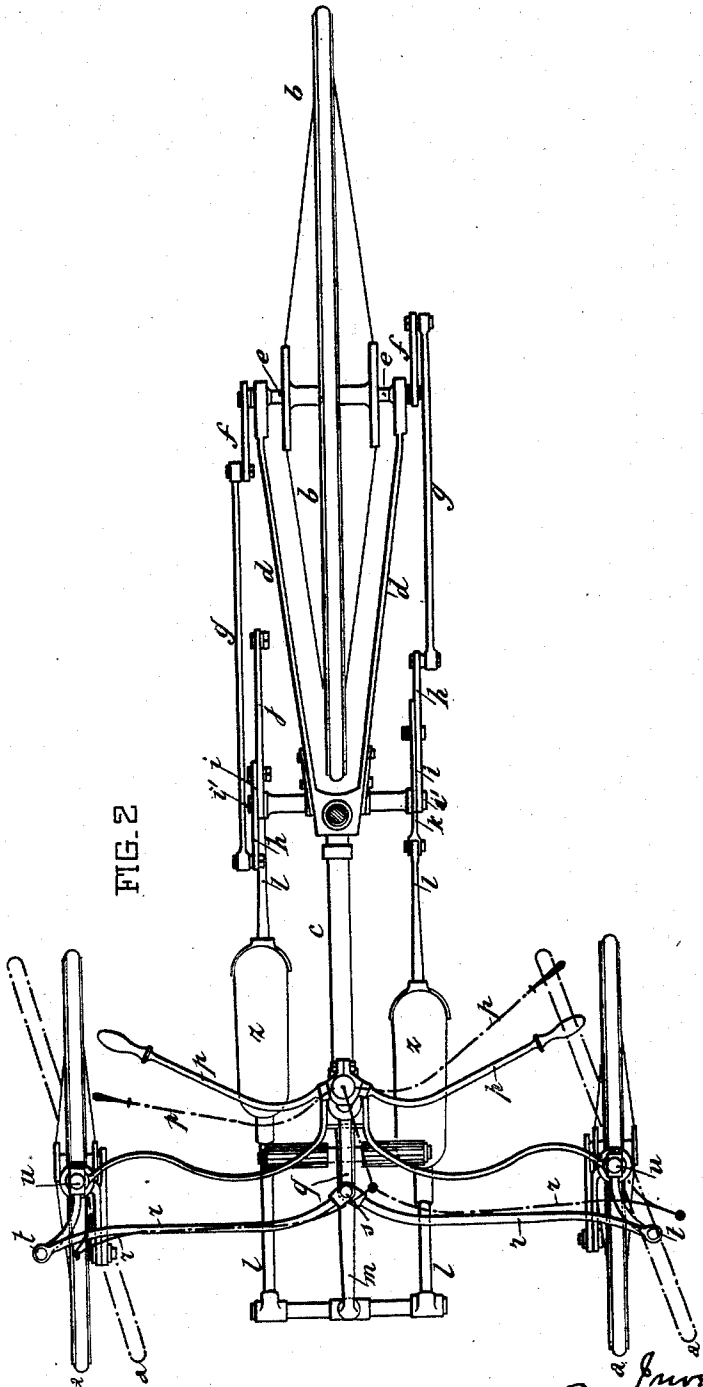


FIG. 2

Witnesses.
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 3 Sheets—Sheet 3.

F. MALFAIT.

VELOCIPEDE.

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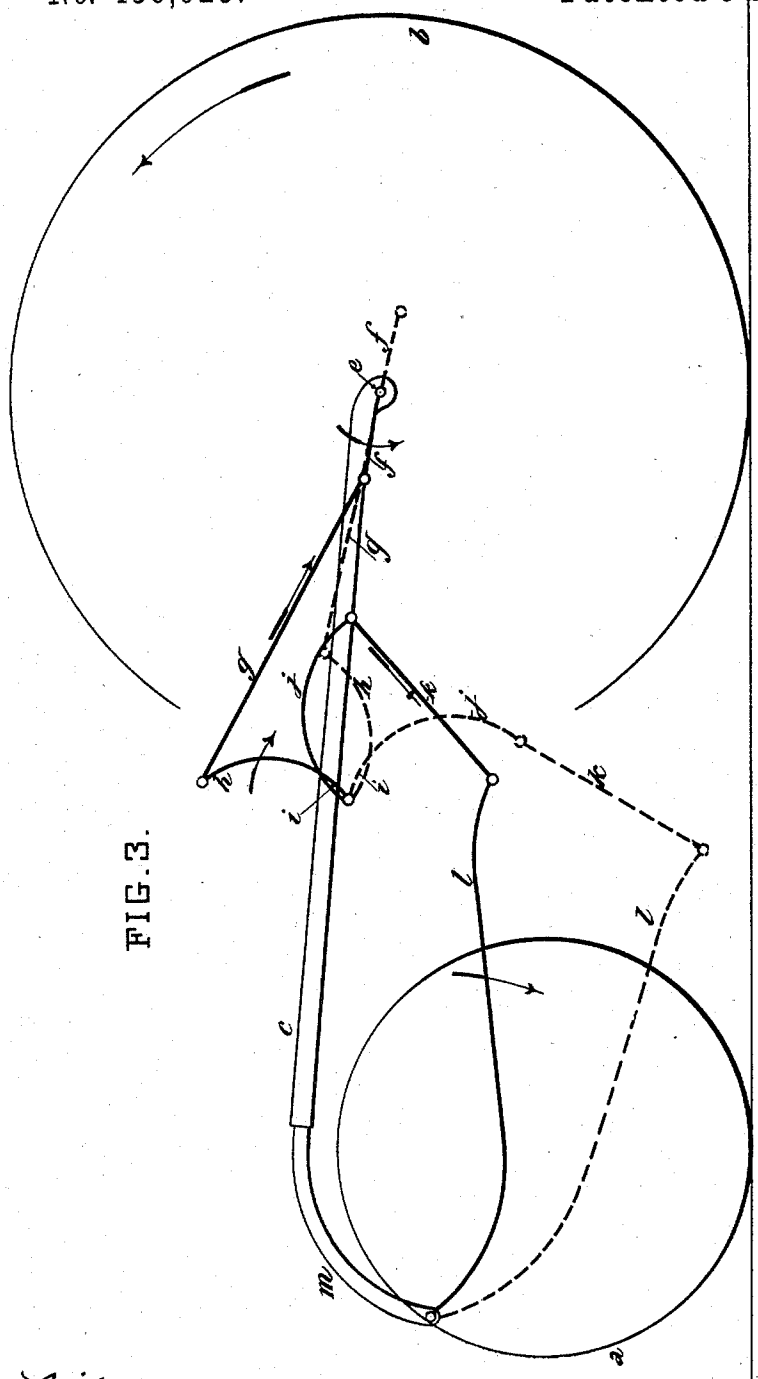


FIG. 3.

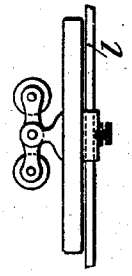


FIG. 4

Witnesses.
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

FREDERIC MALFAIT, OF PARIS, FRANCE.

VELOCIPEDE.

SPECIFICATION forming part of Letters Patent No. 456,625, dated July 28, 1891.

Application filed March 30, 1891. Serial No. 386,941. (No model.) Patented in France May 5, 1888, No. 190,430.

To all whom it may concern:

Be it known that I, FREDERIC MALFAIT, of the city of Paris, France, have invented Improvements in Velocipedes, (for which I have obtained Letters Patent in France for fifteen years, dated May 5, 1888, No. 190,430,) of which the following is a full, clear, and exact description.

My improvements relate more particularly to a tricycle having two front steering-wheels and a rear driving-wheel actuated through connecting-rods and cranks so disposed as to give ease of driving and avoid dead-points.

The particular arrangement and combination of the various parts of the machine are described with reference to the accompanying drawings, forming part of this specification, wherein—

Figure 1 represents a side elevation, and Fig. 2 a plan, of the tricycle. Fig. 3 shows a diagram of the treadle motion. Fig. 4 is a detail.

a a are the steering-wheels; *b*, the driving-wheels; *c*, the frame, and *d d* the driving-wheel fork.

e is the driving-wheel axle; *f f*, the cranks; *g g*, connecting-rods coupled thereto and respectively coupled to the arms *h* of rock-levers *i*, pivoted to the frame at *i'*, the other arms *j* of said rock-levers being coupled by rods *k* to the ends of the corresponding treadle-levers *l l*, pivoted at their front ends to a cross-head carried by a forward extension *m* of the frame *c*.

In operation the depression of the treadle *l* (represented by the full line in Fig. 3) rocks the lever *i*, causing arm *h* and connecting-rod *g* to move backward, turning the crank *f* in the direction of the arrow until it arrives at the diametrically-opposite point. The other treadle (represented by the dotted line) will then be at its highest position, and will act in its turn to complete the rotation of the driving-wheel *b*, and so on.

It will be seen that there is no dead-point, as the treadle mechanism represented in full lines is in its highest position, while the other set (represented in dotted lines) is in its lowest position, which corresponds to its dead-point; but as at this precise moment the first-mentioned set has already passed its dead-point it will carry the other set over its dead-point, and conversely.

The steering-wheels *a* are guided in parallel directions by the steering-handle *p*, acting through the lever-arm *q* and coupling-links *r*, jointed to *q* or *s*, and at *t* to arms on the axes of brackets *u*, forwardly curved at their lower extremities, to which are jointed forwardly-projecting arms *v*, carried by the steering-wheel axes, which are situated to the rear of the plane of the axes, about which the brackets *u* pivot, so that as the steering-wheels are guided to right or left the center of gravity will be thrown toward the center of curvature of the track, thus preventing upsetting. To prevent jolting, the joints between *u* and *v* are loose and strong springs *x* are introduced between these parts, as shown, so as to maintain their proper relative position while permitting free vertical play of the wheel-axles with regard to brackets *u*.

Instead of simple foot-boards *z* for pedals, I may use the ordinary pivoted pedals, as shown in Fig. 4, mounted by a sliding or an oscillating adjustment on the pedal-levers *l*, so as to permit of the length of the stroke of the pedals being varied.

I claim—

1. In a velocipede having a central rear driving-wheel, the combination, with said wheel, of the cranks *f*, connecting-rods *g*, rock-levers *i*, links *k*, and treadle-levers *l*, the links *k* being flexibly interposed between the levers *i* and treadles *l* and said treadles being pivoted at their front ends, substantially as herein shown and described.

2. In a velocipede, the herein-described parallel-motion steering-gear, consisting of the parallel steering-wheels having their axes mounted in arms *v*, that are pivoted to brackets *u*, whose vertical pivotal bearings are in a plane in advance of the wheel-axes, so that as the wheels are inclined the center of gravity is thrown toward the center of curvature of the track and upsetting prevented, as specified.

3. In the herein-described parallel steering-

gear for velocipedes, the combination, with the forwardly-curved pivoted brackets *u*, the arms *v*, jointed thereto and fixed to the wheel-axles, of the springs *x*, applied, as described, to maintain the proper relative position of the parts *u* and *v* and afford an elastic support, substantially as specified.

The foregoing specification of my improvements in velocipedes signed by me this 7th day of March, 1891.

FREDERIC MALFAIT.

Witnesses:
ROBT. M. HOOPER,
ALBERT MOREAU.