(No Model.) 3 Sheets—Sheet 1.

L. P. VALIQUET.

VELOCIPEDE.

No. 357,249. Patented Feb. 8, 1887.

Fig. 1.

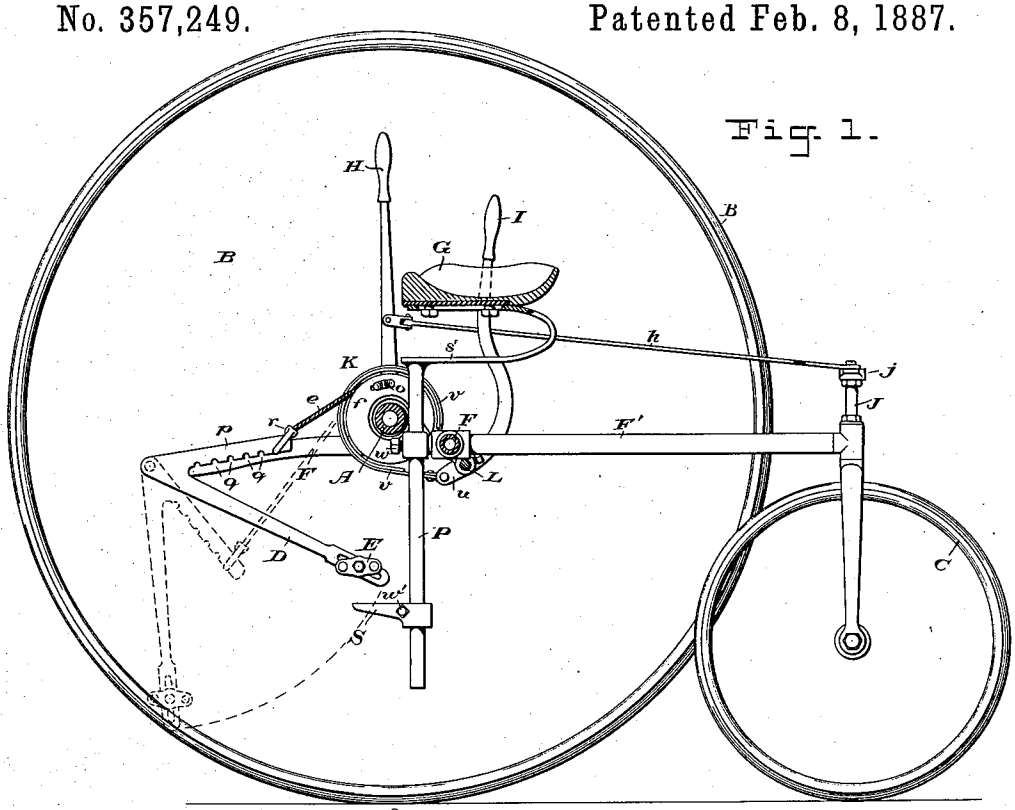
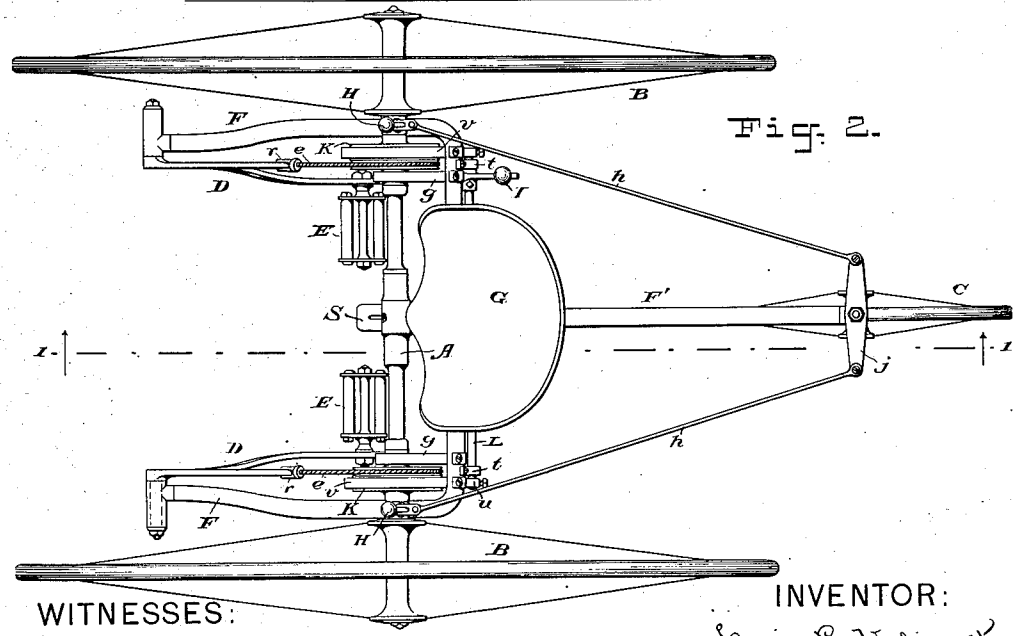


Fig. 2.



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Fig. 3.

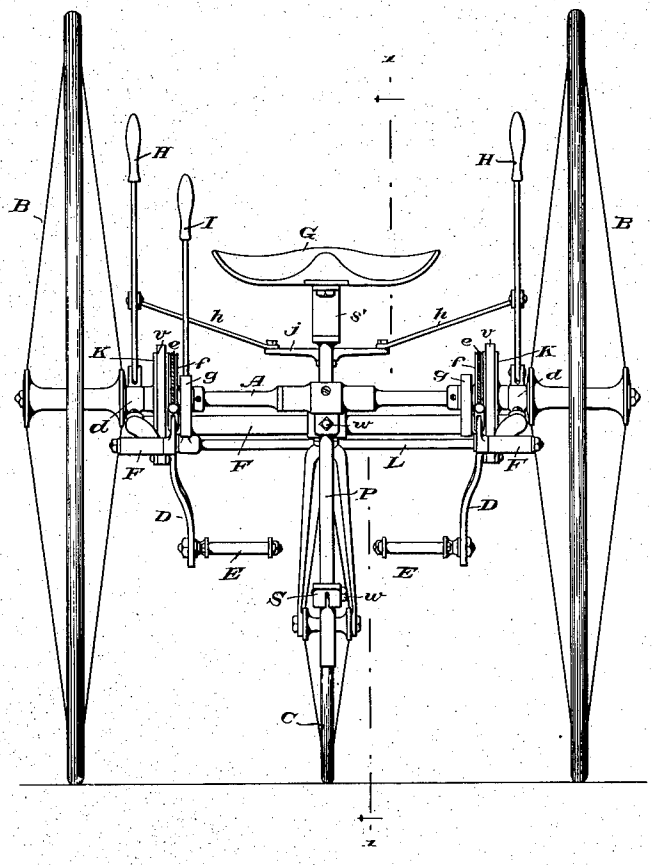


Fig. 4.

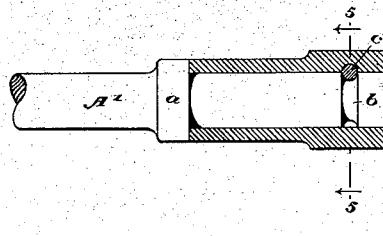
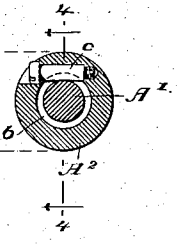


Fig. 5.



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Fig. 6.

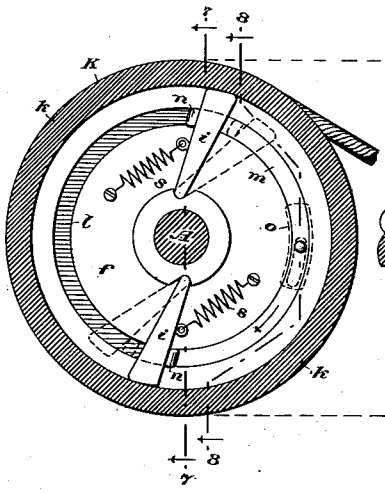


Fig. 7.

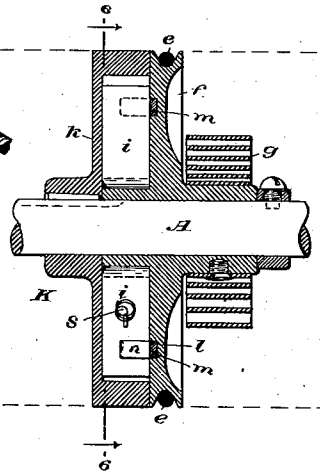


Fig. 8.

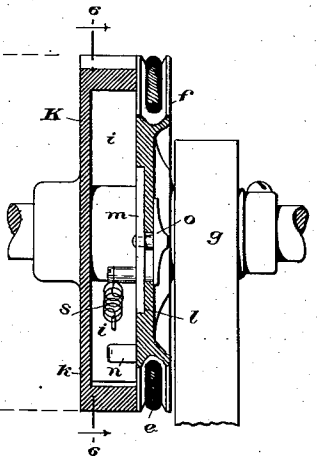


Fig. 9.

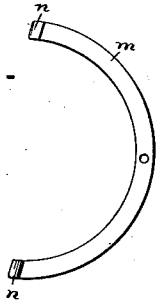


Fig. 10.

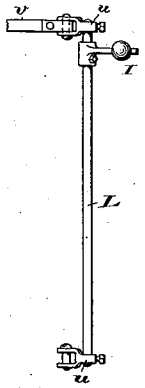


Fig. 11.

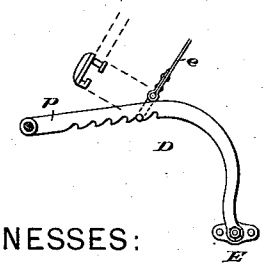
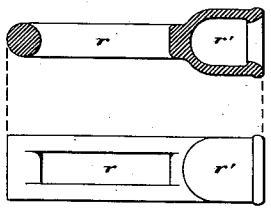


Fig. 12.



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UNITED STATES PATENT OFFICE.

LOUIS P. VALIQUET, OF BROOKLYN, ASSIGNOR TO THE VALIQUET TRICYCLE COMPANY, OF NEW YORK, N. Y.

VELOCIPEDE.

SPECIFICATION forming part of Letters Patent No. 357,249, dated February 8, 1887.

Application filed March 29, 1886. Serial No. 196,960. (No model.)

To all whom it may concern:

Be it known that I, LOUIS P. VALIQUET, residing in Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Tricycles and Similar Vehicles, of which the following is a specification.

This invention includes several improvements in tricycles, with reference more especially to ladies' tricycles, such as the one illustrated in my Patent No. 313,460, granted March 3, 1885.

My improvements pertain to the driving-levers, the clutches, the brake, the axle, the frame, and the step.

Figure 1 of the accompanying drawings is a side view of my improved tricycle, in vertical section, on the line 1 1 in Fig. 2. Fig. 2 is a plan thereof, and Fig. 3 is a front elevation thereof. Fig. 4 is a detail view, on a larger scale, of the middle portion of the axle, partly in section, and Fig. 5 is a transverse section on the line 5 5 in Fig. 4. Figs. 6, 7, and 8 are enlarged detail views, in section, of the driving-clutch. Fig. 9 is a detached view of the disengaging device therefor. Fig. 10 is a detached fragmentary view of the brake mechanism. Fig. 11 shows a modification of the driving-lever, and Fig. 12 shows the connecting-ring *r* in enlarged plan and section.

Referring first to Figs. 1, 2, and 3, let A designate the axle, and B B the large wheels mounted on the ends thereof; C, the steering-wheel; D D, the propelling-levers; E E, the pedals thereon; F F′, the frame; G, the seat or saddle; H H, the steering-levers, and I the brake-lever.

The axle A is made in two parts or sections united at the center by a swivel-joint, as shown in Figs. 4 and 5, so that the two sections may turn independently of each other. The wheels B B are fixed upon the opposite ends of the axle, so that each wheel turns with the section of the axle to which it is fastened. On each section of the axle is a one-way clutch, K, which is oscillated by the vibratory movement of the lever D, through the medium of a rope, strap, or chain, *e*, with a retracting-spring to turn it back. As the clutch rotates forward it carries the axle with it, and as it turns backward it disengages itself and revolves freely. The forward movement of one lever is thus transmitted to the wheel B on the same side of the machine as that lever, and the alternate movement of the two levers imparts an alternate driving movement to the two wheels. I thus avoid the continuous side draft that is experienced in "single drivers," or those tricycles wherein only one wheel is utilized as the driving-wheel, and at the same time I avoid the necessity for complicated connecting mechanism between the two wheels, or two sections of the axle, such as is found in "double drivers." What side draft there is is alternating, and practically neutralizes itself, so that it does not interfere with the steering.

The swivel-joint in the middle of the axle is made by entering the end of one portion or section, A′, of the axle into the end of the other portion, A^2, thereof, which is made tubular or cup-shaped. This tubular portion abuts against a shoulder, *a*, on the portion A′. A groove, *b*, is formed around the entering end, and a screw, *c*, is passed through the tubular portion, so that it enters this groove tangentially, thus serving to prevent the pulling apart of the joint. This feature is designed, chiefly, to prevent any end-play and rattle, as the bearings for the axle in the frame are sufficient to prevent the opening or separation of the joint.

The frame F of the machine is of usual construction, the front part being of U shape, and the rear portion, F′, projecting rearwardly in a straight line. The side limbs of the U-shaped front frame pass just beneath the axle A, and to it are fastened bearings *d d*, through which the axle passes. To the front ends of this frame are pivoted the propelling-levers D D. The rear end of the frame F′ has a vertical bearing for the steering-shaft J, the forked lower portion of which carries the wheel C. This shaft has a cross-head, *j*, the ends of which are connected by rods *h h* with the steering-levers H H. This method of steering is the same as that shown in my said patent. It is not essential to my present invention, as any suitable known steering-gear may be used in its stead, and the steering-wheel may be placed either in front or rear,

as may be desired. I prefer a rear steering-wheel, however, particularly for a tricycle for ladies' use.

The propelling mechanism is, in general, the same as in my said previous patent. The rope, cable, strap, or chain *e* from the lever D extends backward and upward and winds about the oscillating pulley *f* of a friction-clutch, K. A retracting-spring, *g*, rotates this pulley backward, so that it winds up the rope and draws back the lever D. A cup, *k*, is keyed fast to the axle, and within it are two (or more) inclined pawls, *i i*, the inner ends of which are confined in notches in the hub of the pulley *f*, light springs *s s* being arranged to keep the inner ends drawn into these notches and the outer ends pressed out into engagement with the inner surface of the cup. As the pulley *f* is turned forward, these pawls straighten out, bite against the surface of the cup, and carry the cup around with the pulley, thus driving the axle and wheel forward. As the pulley turns backward, the pawls disengage and slide back freely.

It is at times desirable to move a tricycle backward, especially when the rider has dismounted and desires to put the machine away. The backing of the machine is prevented by my construction of these clutches, as shown in my said patent. In order to admit of locking the machine, I have provided a disengaging device for the clutch, which I will now describe. On the inner surface of the pulley *f* is turned an annular groove, *l*, as shown in Figs. 6 and 7, and in this groove is fitted a ring or partial ring, *m*. (Shown detached in Fig. 9.) Projections or fingers *n n* from this ring (preferably made by turning up its ends at right angles) stand behind the pawls *i i*, so that by turning the ring in the direction of the arrow marked on it in Fig. 6 the pawls are turned up far enough to carry their ends clear of the cup *k*, as shown in dotted lines. The ring is thus turned by means of a thumb-piece or button, *o*, on the outer side of the pulley *f*, which is joined to the ring by its stem passing through a slot in the pulley. The friction of the parts is sufficient to hold them in either position, the springs *s s* being too light to cause the pawls to re-engage themselves. Any suitable known device for increasing the friction may be used, if desired, or any sort of positive catch or snap for holding the disengaging device in one position or the other.

This disengaging device is quickly thrown in or out and is very simple and effective. It may be applied with advantage in coasting down hills, to save the pawls from wear.

The levers D D are fulcrumed at a point in front of the axle, and on nearly or approximately the same level, as shown. The pedals E E are somewhat lower when the levers are in the normal position, or retracted, as shown in full lines in Fig. 1. The movement of the pedals is thus in an arc extending downward and forward to the position indicated in dotted lines. Each lever is formed with an arm or portion, *p*, which extends from the fulcrum rearwardly, toward the axle or toward the clutch K. This portion has notches *q q* on its under side. The levers are made, by preference, in the form of elbow-levers, as shown in Fig. 1.

A ring, *r*, is connected to the end of the rope *e*, slips over the arm, *p*, and enters one or another of the notches *q q*. When it is desired to increase or decrease the leverage, the rider slips the ring along the arm *p* from one notch to another. This adjustment is easily and quickly made with one hand and without leaving the saddle or stopping the machine. Such an adjustment of the leverage is highly desirable, in order that the rider may apply his strength to greater advantage of leverage when climbing hills or running over sandy roads than when running on a smooth, level road. An adjustment of this character has heretofore been effected by means of notched pedal-levers, the connection of the rope or chain being shifted from one notch to another. This has been done, however, only when the lever extended in a downward curve from the fulcrum to the pedal.

It will be observed that my lever D is formed with its arm *p* extending backwardly and upwardly, when the lever is retracted, as nearly in line with the rope or other device *e* as possible. This has a double advantage: First, it facilitates the adjustment by bringing the connection within reach of the hand of the rider, so that he has only to reach forward and move the link from one notch to another, pulling the rope forward or letting it back, as may be required; and, second, the leverage varies during the stroke in the best ratio to compensate for the variations in leverage of the human leg—that is to say, at the beginning of the stroke, when the leg is raised, and when, consequently, the muscular power is exerted at a disadvantage, the arm *p* and the rope are nearly in line, so that the angular movement of the arm downward pulls the rope proportionately but a short distance, and as the leg straightens out and its power increases on the well-known toggle principle, the pull of the arm *p* against the rope becomes more direct, so that as the leverage increases in one way it correspondingly decreases in the other.

The rope *e* is preferably a wire rope or cable. In such case I make the ring *r*, as best shown in Fig. 12, with a socket, *r'*, at one end. The end of the wire rope is inserted in this socket and solder is run in to make a solid joint.

Fig. 11 shows a modification of the lever D. Instead of being an elbow-lever, it is a simple lever bent to bring the portion *p* in the proper direction relatively to the position of the pedal E. A strap, *e*, is here shown instead of a wire rope, and a hook, *r*, instead of a ring. The end of the strap passes around the upper bar of the hook and is lapped and riveted. The hook may be passed over the lever *p* when

turned at right angles thereto, but when turned obliquely the hooked end prevents its slipping off the lever.

The brake-lever I is fastened on a shaft, L, Fig. 10, which extends horizontally across the machine and is hung in bearings *t t*, Fig. 2, attached to the rear of the U-shaped frame F. On each end of this shaft is fixed an arm, *u*, Figs. 1 and 10. To the end of each arm *u* is attached a brake-strap, *v*, which extends thence forward and around the periphery of the cup *k* of the clutch, and its opposite end is fixed to the frame F. By pressing the lever I forward both brakes are thus applied simultaneously and equally. The retardation is thus transmitted through the respective sections of the axle to both wheels B B, thereby avoiding any tendency of the machine to swerve to one side when the brake is applied forcibly.

It will be observed that in my machine I secure the advantages of a divided axle in propelling, and yet avoid its disadvantages when it becomes necessary to apply the brake, since the two wheels are impelled forward by the clutches independently of each other, but are retarded simultaneously and equally when the brake is used.

The seat or saddle G is mounted on a spring, *s'*, of any suitable or preferred kind. A cradle-spring answers well. The spring is fixed to the top of a vertical bar or post, P, which is held in a socket in the frame F so that it may move vertically therein, being fastened by a set-screw, *w*. This is a common construction, being adopted in order to enable the seat to be adjusted in height. I fix the step S to this post P by a set-screw, *w'*, or otherwise. This step should be set at a uniform distance from the saddle, rather than at a uniform distance above the ground, in order that the rider in raising himself to his seat shall straighten out his leg comfortably and uniformly, irrespective of the height to which at any particular time he has the saddle set. Thus, by my construction, when the rider alters the height of his saddle, the height of the step is correspondingly altered, keeping the saddle and step at the same distance apart, until, for a rider with shorter or longer legs, it becomes desirable to readjust the distance of the step from the saddle.

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

1. In a tricycle, the combination of a divided axle, two driving-wheels, each fixed upon one end of said axle, two driving-clutches, each fixed upon one section of said axle, two brakes applied to the respective sections of said axle, a brake-lever, and mechanism intervening between said lever and brakes for transmitting the pressure applied to said lever to both said brakes, substantially as set forth, whereby the two driving-wheels are driven independently by said clutches, and, when retarded by the brakes, are retarded simultaneously.

2. In a tricycle or similar vehicle, the combination, with the axle, driving-lever, and driving-wheel, of a friction-clutch consisting of a cup, a pulley carrying friction-pawls, and springs for pressing said pawls outward within said cup, and a disengaging device for said clutch, consisting of fingers projecting behind said pawls, and a moving part bearing said fingers and, when moved in one direction, bringing said fingers into contact with said pawls and pushing the latter forward out of contact with the said cup, substantially as set forth.

3. In a tricycle or similar vehicle, the combination, with the axle, driving-lever, and driving-wheel, of a friction-clutch consisting of a cup, a pulley with friction-pawls, and springs for pressing said pawls outward within said cup, a spring for rotating the pulley and pawls backward, and a disengaging device consisting of a slide having fingers projecting behind the pawls, adapted to operate substantially as set forth.

4. In a tricycle or similar vehicle, the propelling-clutch consisting of a cup connected to the driving-wheel, a pulley carrying friction-pawls, and springs for pressing said pawls outward within said cup, in combination with a disengaging device consisting of a slide carried by said pulley and having fingers projecting behind the pawls, and a button for moving said slide, substantially as set forth.

5. In a tricycle or similar vehicle, the propelling-clutch consisting of a cup, a pulley carrying friction-pawls, and springs for pressing said pawls outward within said cup, in combination with a disengaging device borne by the pulley and in frictional engagement therewith, and having fingers projecting behind said pawls, substantially as set forth.

6. In a tricycle or similar vehicle, the frictional propelling-clutch K, with its pulley formed with an annular groove, in combination with a disengaging device consisting of an annular slide arranged to move in said groove, and having fingers projecting behind the pawls, substantially as set forth.

7. In a tricycle, the combination, with the frame, axle, and driving-wheel, of a driving-clutch, K, a rope, (or equivalent,) *e*, for driving the same, a driving-lever, D, fulcrumed at a point in front of the axle, the said lever having an arm or portion, *p*, to which the said rope is connected, which, when the lever is retracted, projects backwardly from said fulcrum toward the clutch, and a pedal, E, pivoted to said lever at a point below said arm or portion, with an adjustable connection between said rope and the portion *p* of said lever, whereby the rider may at pleasure connect the rope nearer to or farther from the fulcrum of the lever in substantially the manner and to the effect set forth.

8. In a tricycle, the combination, with the frame, axle, and driving-wheel, of a driving-clutch, K, a wire rope, *e*, a ring, *r*, formed with a socket, *r'*, receiving the end of said

rope, and a driving-lever, D, having an arm or portion, *p*, with notches *q q* for engagement by said ring, substantially as set forth.

9. In a tricycle, the combination, with the frame and saddle, of a post, P, vertically adjustable in said frame, and a step, S, fastened to said post, substantially as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

LOUIS P. VALIQUET.

Witnesses:
ARTHUR C. FRASER,
GEORGE HOLT FRASER.