(No Model.)

T. B. JEFFERY.

VELOCIPEDE.

No. 398,158. Patented Feb. 19, 1889.

Fig. 1

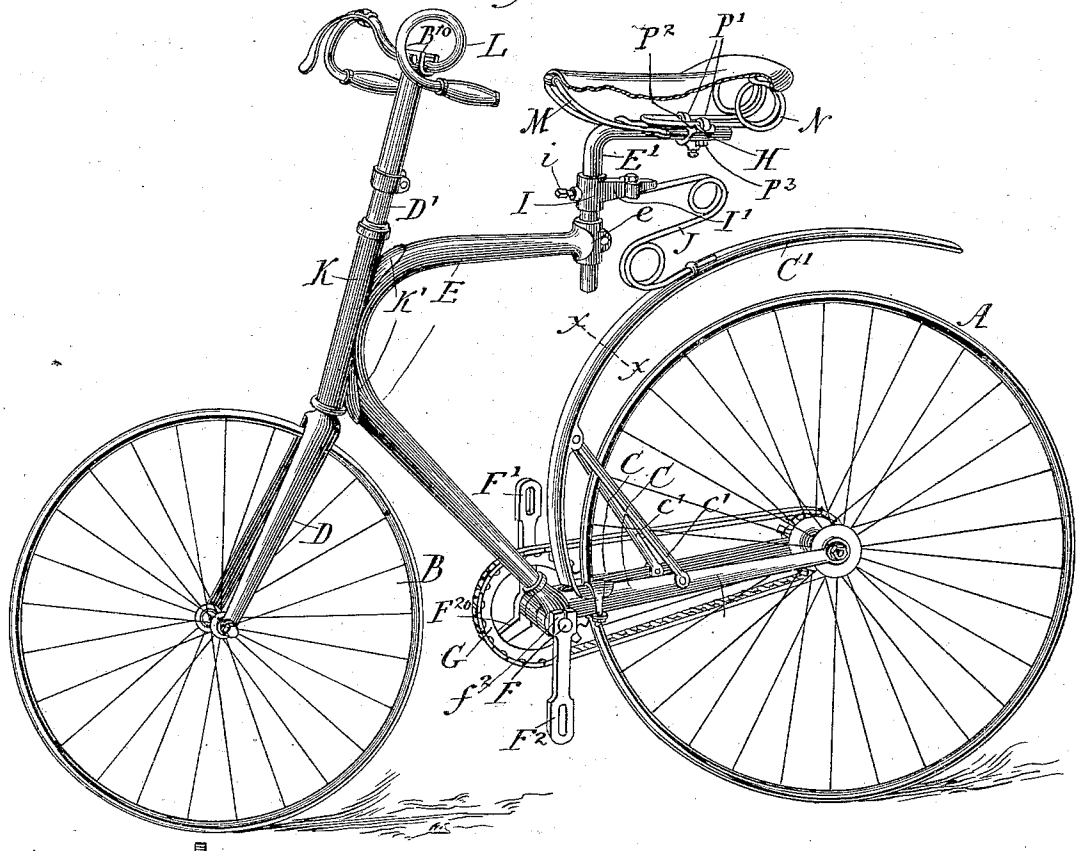


Fig. 2.

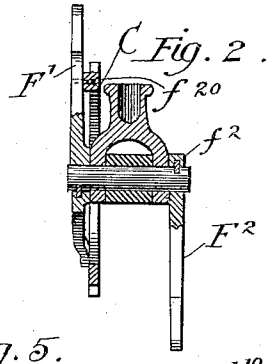


Fig. 3.

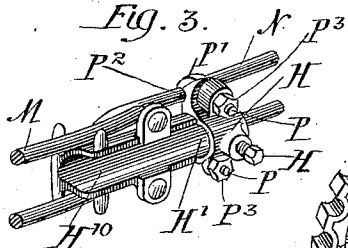


Fig. 4.

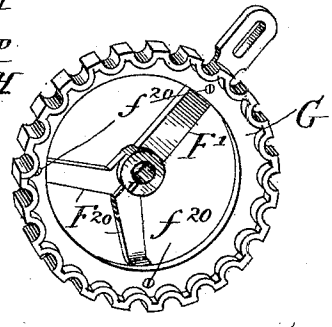


Fig. 5.

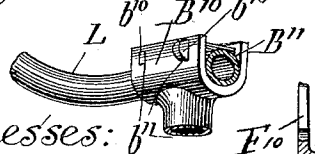
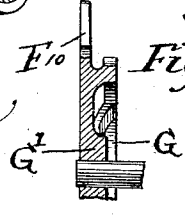


Fig. 6.



Fig. 7.



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UNITED STATES PATENT OFFICE.

THOMAS B. JEFFERY, OF RAVENSWOOD, ILLINOIS.

VELOCIPEDE.

SPECIFICATION forming part of Letters Patent No. 398,158, dated February 19, 1889.

Application filed March 16, 1888. Serial No. 267,374. (No model.)

To all whom it may concern:

Be it known that I, THOMAS B. JEFFERY, residing at Ravenswood, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Velocipedes, which are fully set forth in the accompanying specification, reference being had to the drawings forming a part thereof.

Figure 1 is a side elevation of my improved velocipede, the point of view being from the front on the left-hand side. Fig. 2 is an axial section through the pedal-crank shaft. Fig. 3 is a detail perspective of the seat-supporting plate and means of securing the saddle-springs. Fig. 4 is a detail perspective of the upper end of the steering-rod, showing the means of securing the handle-bar. Fig. 5 is a perspective of the power-communicating wheel and pedal-crank. Fig. 6 is a section at the line *x x* on Fig. 1. Fig. 7 is a fragmentary axial section of a modified form of construction of the power-communicating wheel and the pedal-support.

This invention relates particularly to velocipedes which are driven by the rear wheel, and is especially applicable to bicycles of the class commonly known as "safety." Its principal features are designed to lessen the strain upon the seat-supporting frame when that frame is elastically hinged to the rear driving-wheel frame, this result being accomplished by locating the spring which reacts between the two frames approximately in the vertical line of movement of the seat in respect to the drive-wheel.

In the drawings, A is the rear wheel, which is the driving-wheel.

B is the front wheel, which is the steering-wheel.

C C are the arms of the rear driving-wheel frame, which comprises also the spring mud-guard C′.

D is the steering-wheel frame or fork, which terminates upward in the steering-rod D′. The seat-supporting frame comprises the bow E and the seat-bracket E′.

F is the pedal-crank shaft, which is journaled at the forward end of the arms C C of the rear driving-wheel frame.

F′ is the right-hand pedal-crank, and F^2 the left-hand pedal-crank.

G is the power-communicating wheel, which is represented as a sprocket-wheel, as in the most common form of this class of bicycles. The bow E is pivoted to the forward part of the rear driving-wheel frame in the vicinity of the bearings of the pedal-crank shaft. From that point it extends upward and forward, and thence rearward and slightly upward to a point almost directly above its pivot to the driving-wheel frame, and at that upward termination it is provided with a clamp-socket, *e*, in which the seat-bracket E′ is secured and adapted to be vertically adjusted. The seat-bracket E′ is a piece of round tubular metal bent in the form of a right angle, the vertical limb passing through the clamp-socket *e*, while the horizontal limb affords means for attaching the saddle-plate H. The mud-guard C′ is securely fastened at its lower end to the fork-arms C C of the rear driving-wheel frame, and thence extends upward and rearward in a curve somewhat greater in diameter than that of the driving-wheel, and terminates some little distance rearward of the vertical plane of the drive-wheel axle. It is preferably stiffened by the braces *c′ c′*, which are secured to the fork-arms C C, respectively, and to said mud-guard above its attachment to said arms. This mud-guard is preferably made of elastic material, so that it constitutes a spring for the purpose which will be described; but it is made quite stiff, as by being curved in cross-section, as seen in Fig. 6.

To the vertical arm of the seat-bracket E′, above the clamp-socket *e*, I secure the clip I adjustable up and down on said arm and provided with a seat-screw, *i*, by which it may be clamped in any desired position thereon. This clip has a rearwardly-extending finger, I′, which overhangs the mud-guard C′. Between said mud-guard and said finger I locate the double coil-spring J, which has one end secured to the mud-guard and the other end to said finger, and reacts between them. This spring may be of any other form, and may be of any material capable of affording the desired reaction against compression between said two parts to which it is secured.

The steering-head K is formed so that it constitutes a re-enforcement of the bow E, and is located at its apex, the axis of the steering-rod D′ being substantially tangen-

tial to the curve of the bow E at the apex thereof. In order to thus secure the steering-head to the bow and make it re-enforce the same, it is cast or forged with a flange, K′, fitting the convex surface of the bow E on its forward side and is brazed thereto.

The pedal-crank F^2 is secured to the crank-shaft F in any familiar manner, being provided with a hub or boss, f^2, for that purpose. The power-communicating wheel G is made without any hub, being in fact only an annulus—that is, being open at the center and being secured to the pedal-crank F′ rather than directly to the crank-shaft F. In order to provide the means for securely fastening the wheel G, the pedal-crank F′ may have one or more arms, as F^{20}, extending from its hub and bolted or riveted to the annular wheel G, as shown in the drawings.

The purposes of this construction are:

First. To save the space on the pedal-crank shaft F which would be occupied by the hub for wheel G, thus leaving available for the bearings of the shaft in driving-wheel frame the entire space between the pedal-cranks F′ and F^2, so that that bearing may be broad, as desired, without unduly separating said cranks.

Second. In order to permit the removal of the power-communicating wheel G without detaching the crank. Such removal is often required for the purpose of changing the speed by substituting a wheel of different size. The opening in the center of the annular wheel shown permits it to be removed by passing it over the crank and the securing-arms F^{20} after having withdrawn the securing screws or bolts f^{20}, by which it is fastened to said crank and arms.

Third. To avoid the weight of the additional hub and web, which would otherwise be required for the wheel G.

The handle-bar L is secured to the upper end of the steering-rod in the cross-arm B^{10}, formed upon the upper end of said steering-rod, and having in its upper side a groove or depression, B^{11}, which forms the seat for the handle-bar. The handle-bar is placed therein and forced down in it by any suitable clamping device operating above the bar, as by the keys b^{10} b^{10}, inserted through the holes b^{11} in the flanges which form the two sides of the groove B^{11}. This construction enables me to locate the handle-bar at the height desired by use of the shortest possible steering-rod, and therefore with the least possible material to add weight.

The saddle-plate H is provided with a longitudinal socket, H′, by means of which it fits onto the horizontal arm of the seat-bracket E′; but to save weight the under half of that socket is cut away throughout the greater portion of its length, leaving the seat-plate throughout that portion with merely a half-round groove, H^{10}, on its under surface. To this saddle-plate H are secured the front and rear saddle-springs, M and N, respectively. One of these springs is secured to the plate fixedly and the other adapted to be adjusted back and forth thereon. As illustrated on the drawings, the forward spring, M, is fixedly secured and the rear spring, N, is adjustably attached to the saddle-plate. The means of attaching the spring N so as to permit its adjustment back and forth as necessary, to stretch the saddle, consists of eyebolts P P, through whose eyes P′ spring N passes, resting also in the horizontal half-round groove P^2, formed upon the upper surface of the saddle-plate. The stems of the eyebolts pass down to the saddle-plate and protrude below it, and upon their threaded ends are provided with clamping-nuts P^3, by means of which they are drawn down and serve to clamp the spring which passes through the eyes firmly into the half-round groove P^2 and hold the spring at any point to which it may be adjusted longitudinally in said eyes. The entire plate H is held in any position to which it may be adjusted on the horizontal arm of the seat-bracket E′ by means of a set-screw, H, which jams against the said horizontal arm.

Part of the advantage which I aim to effect by the construction of the power-communicating wheel and pedal-crank shown in Figs. 2 and 4 may be obtained by making the power-communicating wheel with a hub, G′, so that it may be directly attached to the pedal-crank shaft, and providing it also with an arm, F^{10}, for a pedal-support, which is equivalent to the pedal-crank, but has no direct attachment to said shaft. This construction is illustrated in Fig. 7.

I claim—

1. In a velocipede, in combination with a rear driving-wheel and the frame in which it is journaled, the seat-supporting frame hinged to the forward part of the driving-wheel frame, and extending thence forward and upward to the steering-head and to the seat, the former being at the forward part and the latter at the rear upper part, and the spring reacting between the rear upper portion of the seat-supporting frame and the rear driving-wheel frame, substantially as set forth.

2. In a velocipede, in combination with a rear driving-wheel and the frame in which it is journaled, the seat-supporting frame pivoted to the forward part of said driving-wheel frame, and extending thence to the steering-head and to the seat, the former being at the forward part and the latter at the rear part, the mud-guard secured to the rear driving-wheel frame, and extending thence rearward over the wheel to a point in the vicinity of the rear part of the seat-supporting frame, and a spring reacting between said mud-guard and said rear part of seat-supporting frame, substantially as set forth.

3. In a velocipede, in combination with the rear driving-wheel and the frame in which it is journaled, the seat-supporting frame hinged to the forward part of said driving-wheel frame, and extending thence to the steering-

head and to the seat, the former being at the forward part and the latter at the rear part, and a spring mud-guard secured to the rear driving-wheel frame, and extending back over the wheel to the vicinity of the rear part of the seat-supporting frame, and connected to said seat-supporting frame at the said rear part, whereby it acts as a spring reacting between the seat-supporting frame and the rear driving-wheel, substantially as set forth.

4. In a velocipede, in combination with the rear driving-wheel and the frame in which it is journaled, the seat-supporting frame hinged to said rear driving-wheel frame, and extending thence to the steering-head and to the seat, the former being at the forward part and the latter at the rear part, a spring mud-guard secured to the rear driving-wheel frame, and extending over the wheel to the vicinity of the rear part of the seat-supporting frame, and a spring connecting said spring mud-guard with the said rear part of the seat-supporting frame, substantially as set forth.

5. In a velocipede, in combination with the rear driving-wheel and the frame in which it is journaled, the seat-supporting frame hinged to the forward part of said rear driving-wheel frame, and extending thence to the steering-head and to the seat, the former being at the forward part and the latter at the rear part, and a spring connected to the said rear driving-frame and to the seat-supporting frame and reacting between said frames, its connection with one of them being adjustable to vary the tension of the spring, substantially as set forth.

6. In a velocipede, in combination with the rear driving-wheel frame, the seat-supporting frame hinged thereto and having a seat-supporting bracket overhanging the rear driving-wheel and vertically adjustable with respect to the remainder of the seat-supporting frame, and a spring secured to said seat-bracket and to the rear driving-wheel frame, substantially as set forth.

7. In a velocipede, the seat-supporting frame in the form of a bow convex forward and open rearward, and having its two branches in a vertical plane and diverging rearward, and the steering-head located at the apex of said bow, substantially as set forth.

8. In a velocipede, the seat-supporting frame in the form of a bow convex forward and having its two arms diverging rearward and in the same vertical plane, and having a re-enforcing piece secured to it at the vicinity of the apex of its curvature, substantially as set forth.

9. In a velocipede, the seat-supporting frame in the form of a bow convex forward and having its two arms diverging rearward and in the same vertical plane, and having the steering-head formed with the flanges K, fitting the bow, whereby said steering-head constitutes a re-enforcement of the bow at its apex, substantially as set forth.

10. In combination with the pedal-crank shaft, the pedal-crank provided with a hub, by which it is secured to the shaft, and with arms for securing the power-communicating wheel, such power-communicating wheel having no hub, but having an opening about its center large enough to permit the crank-hub and its arms to pass through, whereby said power-communicating wheel may be passed over the crank and its arms, and secured behind or within the same without detaching the crank from the shaft, substantially as set forth.

In testimony whereof I have hereunto set my hand, in the presence of two witnesses, at Chicago, Illinois, this 5th day of March, A. D. 1888.

THOS. B. JEFFERY.

Witnesses:

E. F. BURTON,

CHAS. S. BURTON.