(No Model.) 2 Sheets—Sheet 1.

E. G. LATTA.

VELOCIPEDE.

No. 387,979. Patented Aug. 14, 1888.

Fig. 1.

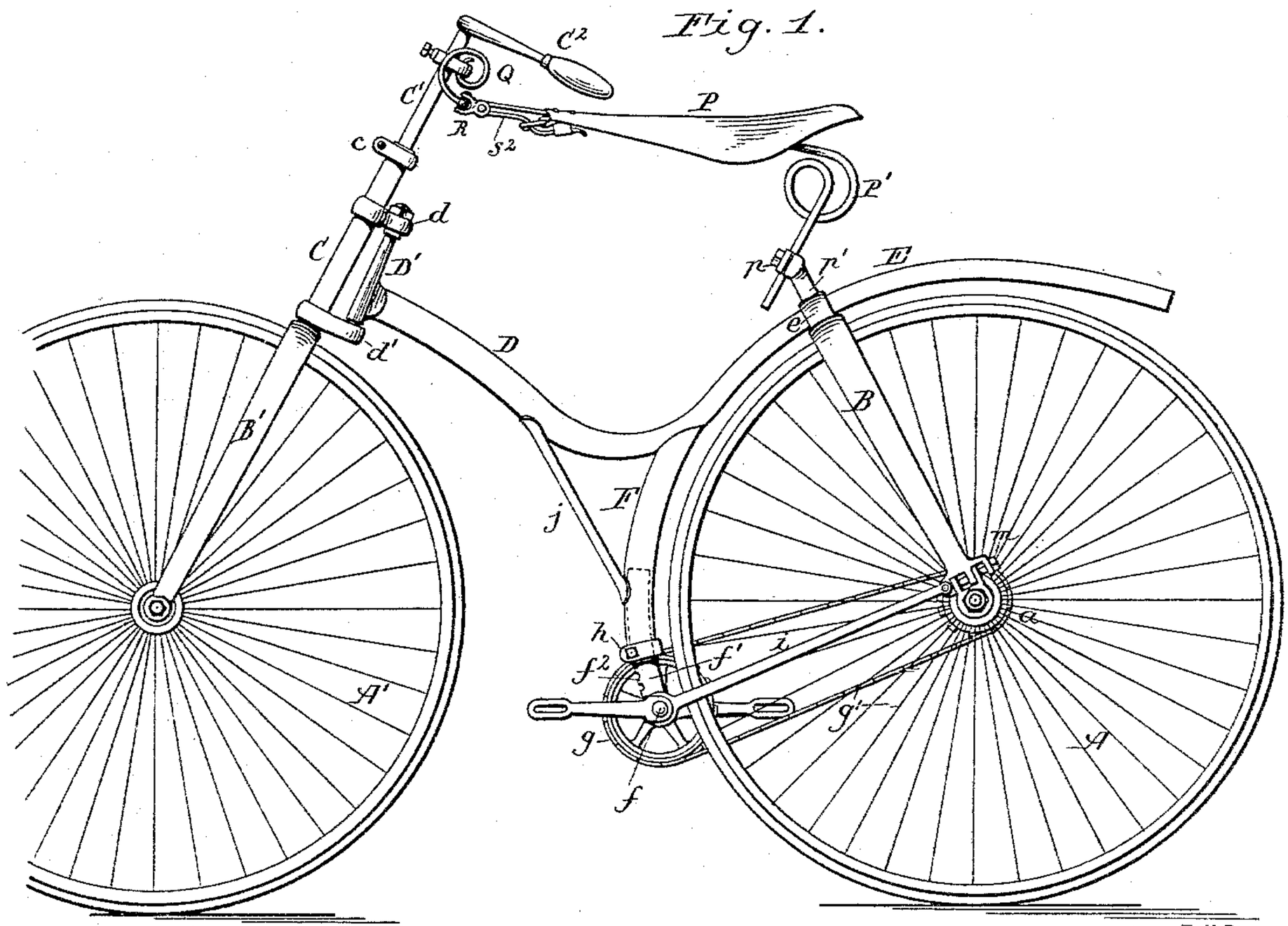


Fig. 2.

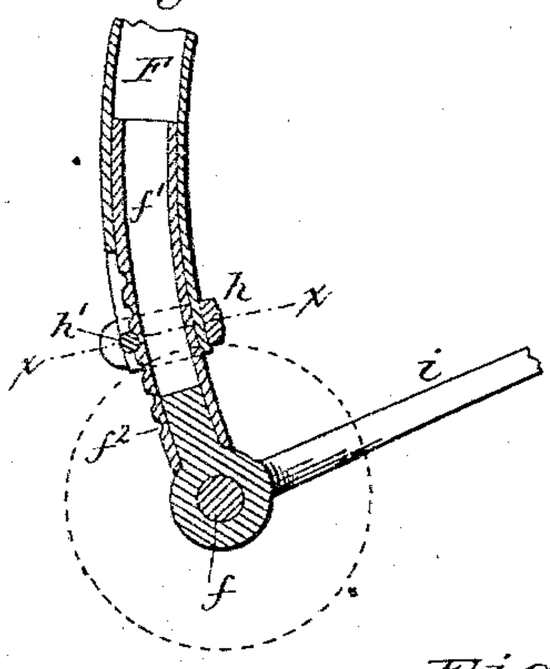


Fig. 3.

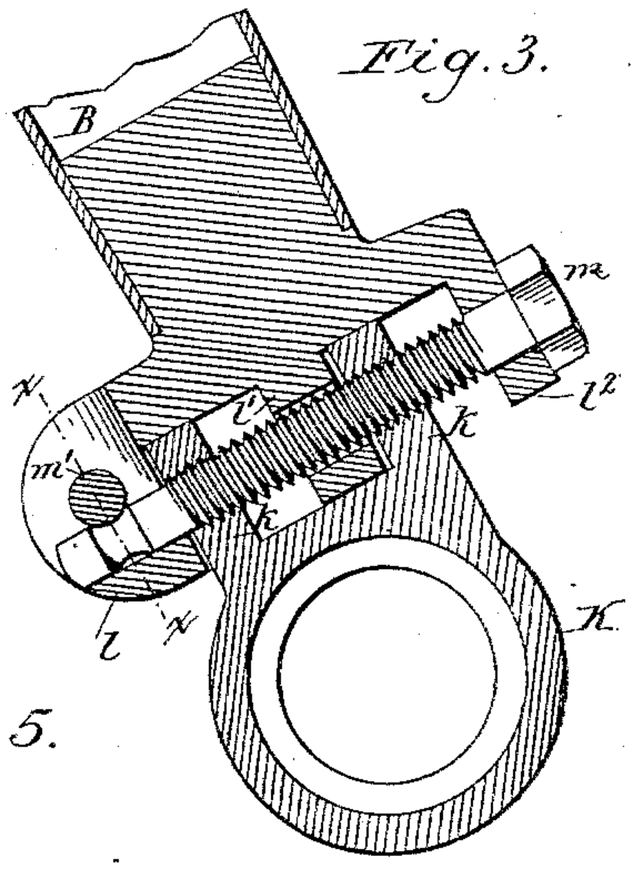


Fig. 4.

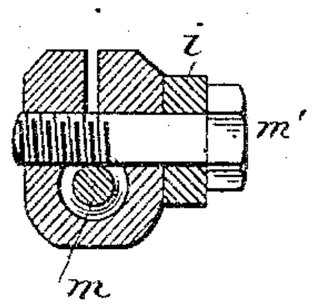
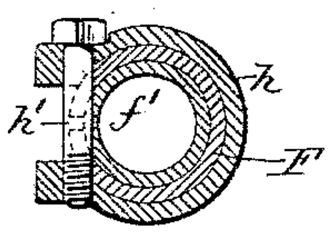


Fig. 5.



Witnesses:
Chas. J. Buchheit.
Theo. L. Popp.

E. G. Latta Inventor.
By Wilhelm & Bonnell
Attorneys.

(No Model.) 2 Sheets—Sheet 2.

E. G. LATTA.

VELOCIPEDE.

No. 387,979. Patented Aug. 14, 1888.

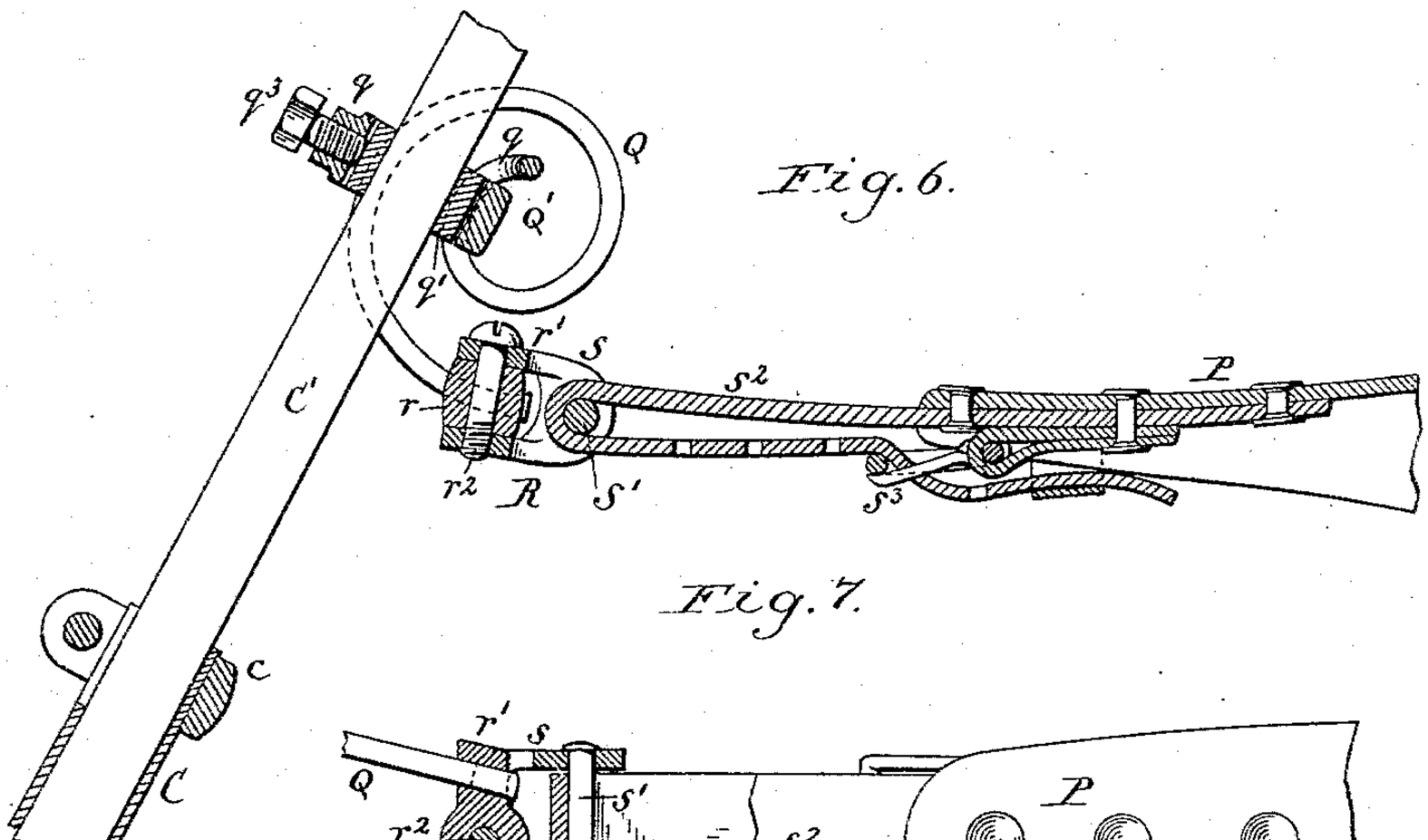


Fig. 6.

Fig. 7.

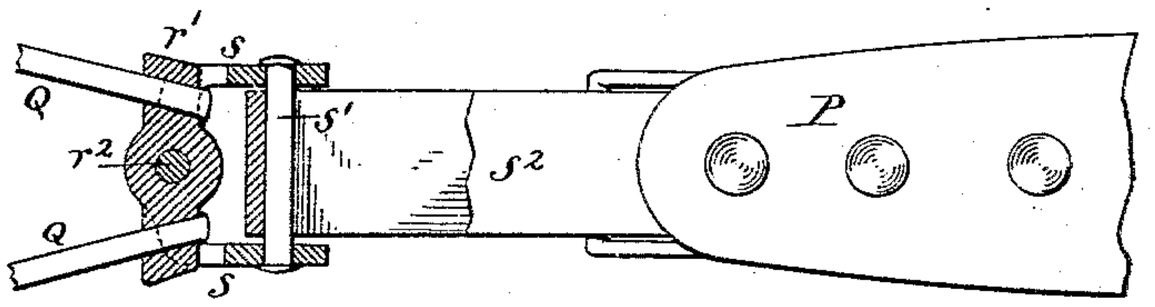


Fig. 9.

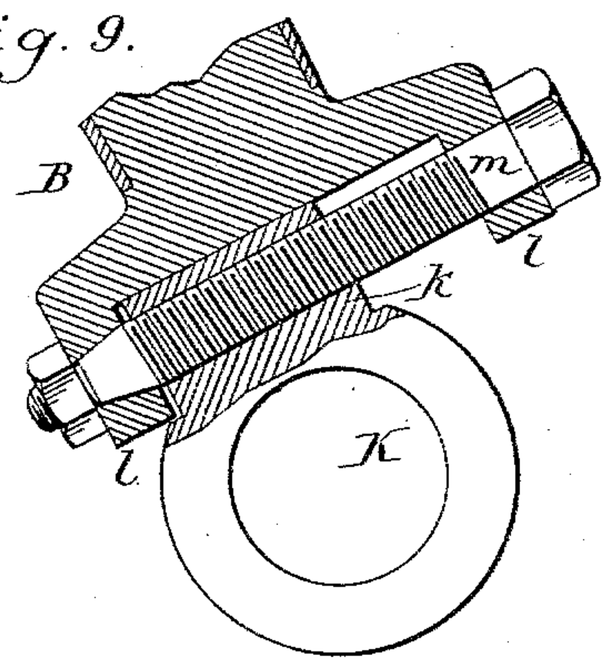


Fig. 8.

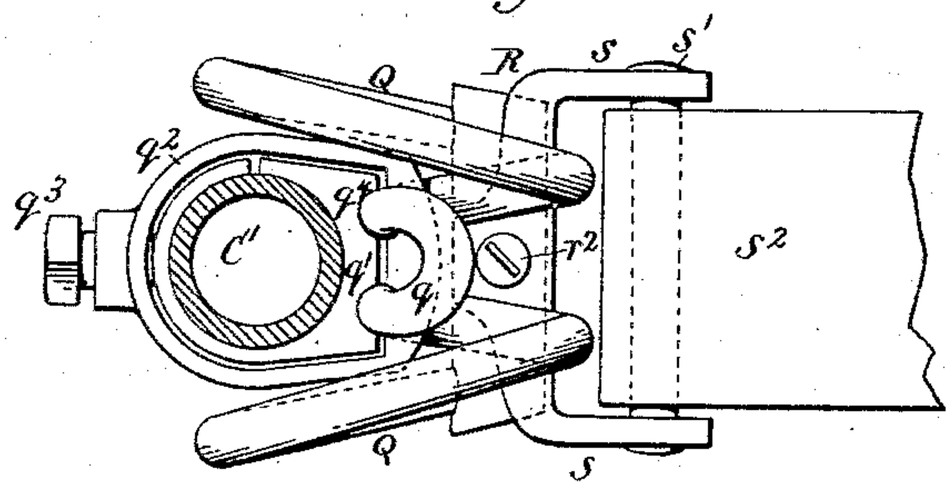
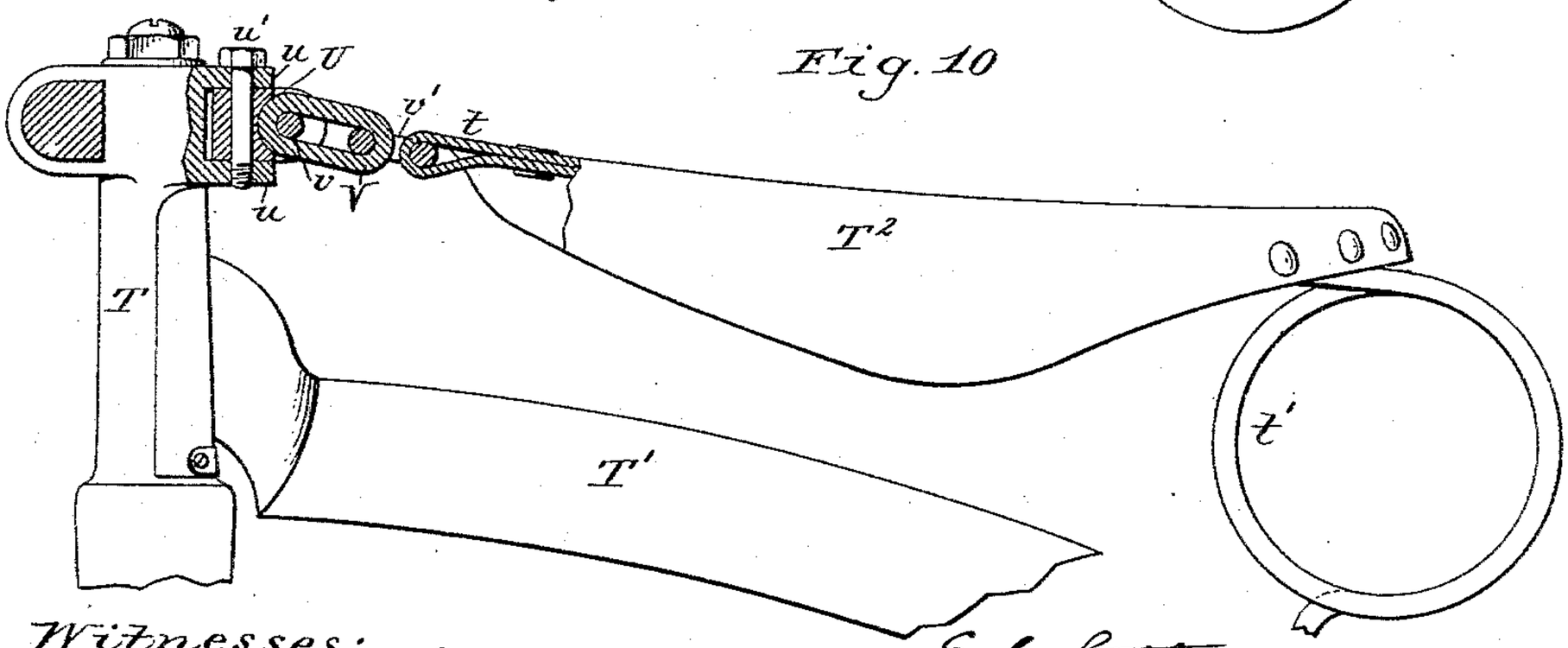


Fig. 10



Witnesses:
Chas. J. Buchheit
Theo. L. Popp.

E. G. Latta. Inventor.
By Wilhelm & Bonner
Attorneys.

UNITED STATES PATENT OFFICE.

EMMIT G. LATTA, OF FRIENDSHIP, NEW YORK, ASSIGNOR TO THE POPE MANUFACTURING COMPANY, OF PORTLAND, MAINE.

VELOCIPEDE.

SPECIFICATION forming part of Letters Patent No. 387,979, dated August 14, 1888.

Application filed February 8, 1888. Serial No. 263,347. (No model.)

To all whom it may concern:

Be it known that I, EMMIT G. LATTA, of Friendship, in the county of Allegany and State of New York, have invented new and useful Improvements in Velocipedes, of which the following is a specification.

The objects of this invention are to improve the construction of the frame of the velocipede, so as to render the same lighter and increase its strength and rigidity; to provide efficient means for adjusting the drive-chain for wear, to render the saddle more perfectly adjustable, and to attach the same in such a manner that the steering-wheel will be kept in line with the driving-wheel by the rider's weight and the tension of the saddle-springs, and the steering-pivot will be relieved from a large part of the strains.

The invention consists, to these ends, of the improvements which will be hereinafter described, and pointed out in the claims.

In the accompanying drawings, consisting of two sheets, Figure 1 is a side elevation of my improved velocipede. Fig. 2 is a sectional elevation, on an enlarged scale, of the adjustable support in which the crank-shaft is journaled and the tube in which said support is arranged. Fig. 3 is a vertical section, on an enlarged scale, of one of the bearing-boxes of the driving-wheel and the lower end of the rear fork, and showing the means of adjusting the bearing-box on the fork. Fig. 4 is a cross-section in line *x x*, Fig. 3. Fig. 5 is a cross-section in line *x x*, Fig. 2, on an enlarged scale. Fig. 6 is a vertical longitudinal section of the front portion of the saddle and connecting parts. Fig. 7 is a horizontal section of the coupling at the front end of the saddle. Fig. 8 is a top plan view of said coupling, the front spring of the saddle, and the clamp whereby the saddle-spring is attached to the handle-bar post. Fig. 9 is a sectional elevation showing a modified construction of the means whereby the bearing-boxes of the driving-wheel are adjustably secured to the fork. Fig. 10 is a sectional side elevation showing my improved saddle applied to an ordinary bicycle.

Like letters of reference refer to like parts in the several figures.

A represents the rear driving-wheel, having a sprocket-wheel, *a*, and A′ is the front steering-wheel.

B is the fork of the driving-wheel, and B′ the fork of the steering-wheel.

C represents the tubular steering post or head, formed with or secured to the upper end of the front fork, B′. C′ is the handle-bar post adjustably secured in the steering-post by a suitable clamp, *c*, and C^2 are the handle-bars.

D represents the tubular reach or backbone, and D′ is the steering-spindle, which is pivoted with its upper and lower ends in suitable bearings arranged in brackets *d d′*, secured to the rear side of the steering-head C.

The tubular reach D extends downwardly and rearwardly from the steering-spindle D′, and is provided with a rearward extension, E, the main portion of which is curved concentric with the upper portion of the driving-wheel A and forms a mud-guard for the latter. The reach-extension E is secured to the upper end of the rear fork, B, by a sleeve, *e*, brazed to the extension, and which may partly or entirely surround the latter. This sleeve is provided with two stubs or projections, (not shown in the drawings,) to which the upper ends of the tubular rear fork are secured, preferably by brazing.

The reach-extension E is preferably made crescent-shaped in cross-section; or its outer surface may be made semicircular or convex and its inner surface flat.

F represents a depending tube or bracket secured with its upper end to the reach D, and *f* is the horizontal crank-shaft, which is journaled in suitable bearings secured to the lower end of a supporting-tube, *f′*, adjustably arranged in the lower end of the depending tube F.

g is a sprocket-wheel secured to the crank-shaft *f*, and *g′* is a drive-chain connecting the sprocket-wheel *g* with the sprocket-wheel *a*, mounted on the axle of the driving-wheel A. The inner supporting-tube, *f′*, is adjustably secured in the tube F by means of a clamping-ring, *h*, surrounding the lower end of the tube F, which latter is split longitudinally, as shown in Fig. 2. The supporting-tube *f′* is provided with a series of notches or recesses, f^2, arranged one above the other, and in either of which

engages the horizontal clamping-bolt *h'* of the ring *h*, by which means the supporting-tube is firmly secured in the tube F.

i represents braces arranged on opposite sides of the driving-wheel and pivoted at their rear ends to the lower ends of the rear fork, B, at or near the center thereof, and secured at their front ends to the bearings of the crank-shaft *f*. A single brace *i* on one side of the driving-wheel may be employed, if desired. The inner tube, *f'*, and the lower end of the outer tube, F, are curved concentric with the pivots of the braces *i*, so that the crank-shaft and connecting parts may be raised and lowered without springing the fork B and tubes F *f'*, and without perceptibly affecting the tension of the drive-chain *g'*, while at the same time supporting the driving-gear by a rigid frame which effectually resists the severe cross-strains exerted by the cranks.

The lower portion of the tube F is connected with the reach D by an inclined brace, *j*, which serves to stiffen both of these parts.

K represents the bearing-boxes of the driving-wheel, which are each provided with two lugs, *k k*, which are attached to similar lugs, *l l' l²*, formed at the lower end of the rear fork, B, by screw-bolts *m*. The openings in the lugs *k k* are screw-threaded, while the openings of the lugs *l l' l²* and the ends of the screw-bolts resting in the lugs *l l²* are made smooth. The bolts *m* are capable of turning in the lugs of the fork and bearing-boxes, but are held against lengthwise movement therein by transverse-bolts *m'*, which are arranged in transverse openings formed in the innermost lugs, *l*, of the rear fork and engage in annular grooves or depressions formed in the screw-bolts *m*, as shown in Figs. 3 and 4. The lugs *l* are split vertically and are clamped around the ends of the bolts *m* by the bolts *m'*, which also serve to attach the rear ends of the braces *i* to the fork B. Upon loosening the bolts *m'* the screw-bolts *m* can be turned, and after the boxes are properly adjusted, the bolts *m* are held against turning by tightening the bolts *m'*.

The lugs *k k* of the bearing-boxes engage between the lugs *l l' l²* of the fork, and these lugs are arranged at a sufficient distance apart to allow the lugs of the bearing-boxes to move forwardly or backwardly between the lugs of the fork upon turning the screw-bolts *m*, so as to shift the bearing-boxes forwardly or backwardly on the fork for adjusting the drive-chain *g'*. A single lug, *k*, may be formed on the bearing-boxes and two lugs on the fork, as represented in Fig. 9, but I prefer to construct the bearing-boxes with two lugs and the fork with three lugs, as shown in Fig. 3, to insure the lugs of the boxes against wearing loose on the bolts *m*.

If desired, the transverse bolts *m'*, for holding the screw-bolts *m* against longitudinal movement, may be dispensed with and the end of the screw-bolt be made conical, as shown in Fig. 9, and clamped in a correspondingly-shaped seat by a nut applied to the threaded end of the bolt and bearing against the outer side of the adjacent lug of the fork.

If preferred, the bolt *m* may be held against turning in the lugs of the bearing-box and the openings in the lugs of the fork be screw-threaded, in which case the fork will move on the bearing-box upon turning the screw-bolt, and the same result be obtained as in the first-described construction.

The lug or lugs of the bearing-box are preferably arranged eccentrically, or on one side of the center of the bearing-box, as shown in Fig. 3, so that when the limit of adjustment of the screw-bolt *m* is reached, the bearing-boxes may be reversed on the screw-bolts, so as to again bring the lugs to their initial position on the screw-bolt and enable a farther adjustment until the outermost lug, *l²*, of the fork is struck by the adjacent lug of the bearing-box. By this construction the traversing space or range of the screw-bolt need be but half as long as would be necessary if the bolt alone were used for effecting the adjustment without the reversible feature of the bearing-box.

The rear end of the mud-guard or reach-extension E is made straight, as shown in Fig. 1, to permit the rear wheel to be moved rearwardly in adjusting the drive-chain without coming in contact with the mud-guard.

The bearing-box lugs are capable of turning on the bolt *m* as a pivot in the usual manner, for preventing cross-strains upon the ball-bearings. By this construction the expense of a separate drive-chain adjustment is obviated, as well as extra weight.

It is obvious that the bearing-boxes of the crank-shaft may be connected with the adjustable supporting-bar *f'* by a screw-bolt and lugs similar to the adjustable connection of the rear fork and bearing-boxes. This construction is desirable for velocipedes in which the rear driving-wheel turns on a fixed axle. In this case the brace is pivoted with its rear end to the fixed axle, and with its front end to the supporting-bar *f'*.

P represents the saddle, which is of the class commonly known as "hammock" saddles, and consisting of a flexible seat of leather or other suitable material suspended at both ends.

P' represents the rear spring, which is composed of two branches secured with their upper ends to the cantle of the saddle in any suitable manner, and adjustably secured with their lower ends in a clamp, *p*, arranged at the upper end of a bracket or extension, *p'*, formed on the sleeve *e*. The branches of the spring P' are each formed with a coil or scroll to give the spring the necessary elasticity.

Q represents the front spring of the saddle, which consists of two scrolls or volutes formed of a single length of wire doubled at *q*, as represented in Fig. 8. The inner doubled por-

tion, q, of the spring is adjustably secured in a clamp, Q′, consisting of an inner split collar, q', surrounding the steering-post C′, and another clamping band or frame, q^2, embracing the collar q' and tightened upon said collar by a clamping-bolt, q^3, working in an opening in the front side of the band q^2 and bearing against the collar q'. The collar q' and band q^2 are provided in their adjacent portions with grooves q^4, which receive the branches of the spring Q. From the clamp Q′ the branches of the spring are curved to form the coils or scrolls, and the ends of the branches extend backwardly and are secured to a block, r, which latter is pivoted to a coupling, R. The latter consists of two horizontal lugs, r' r', between which the block r is pivoted by an upright bolt, r^2, and two vertical lugs, s s, arranged at right angles to the lugs r' r' and connected by a horizontal bolt, s'.

s^2 is a strap running around the horizontal bolt s' and secured with its rear end to the front end of the saddle P by rivets or otherwise. This strap is provided with a suitable buckle, s^3, so that the tension of the saddle can be regulated as desired. The coupling R forms a universal joint between the saddle and spring Q, and is located in rear of the steering-spindle D′. This arrangement causes the steering-wheel A′ to be held in line with the driving-wheel A by the tension of the spring Q when the machine is not in use, and when in use the wheels are held in line by the tension of the spring and the weight of the rider.

Upon loosening the clamping-bolt q^3 the spring Q can be turned in its clamp so as to adjust the coupling R at the desired distance in rear of the steering-spindle, the tendency of the steering-wheel to maintain a direct course being increased as the coupling is moved backwardly away from the steering-spindle. The upper end of the latter is preferably tilted forward slightly, so as to stand at an angle to the steering post or head C, as shown in Fig. 1.

If the rider has learned to ride this class of machine with the saddle supported by a rear frame only, the pivot r^2 may be arranged in line with the steering-spindle D′, in which case the steering will be the same as if the saddle were disconnected from the front frame. When thus arranged, the saddle is more comfortable and capable of more complete adjustment and the steering-spindle D′ is relieved from a great part of the rider's weight. A further advantage of this construction is that the strains received by the steering-pivot when the front wheel strikes an obstruction are to a great extent counteracted by the backward pull of the saddle. These last-named advantages are also obtained when the coupling R is located in rear of the steering-spindle.

The front end of the saddle can be raised and lowered by loosening the clamp c and raising or lowering the handle-bar post C′. The branches of the rear spring P′ are arranged parallel with or at the same angle as the handle-bar post C′ and head C, so that both ends of the saddle can be raised and lowered, without disturbing the tension of the saddle. The strap s^2 requires to be adjusted only when one end of the saddle is raised or lowered, or when the tension of the saddle-springs or the leather saddle is adjusted, or when the coupling R is moved backwardly or forwardly. The inclined position of the steering-head and the branches of the rear spring Q causes the saddle to move backward or forward slightly as it is elevated or lowered, thereby bringing it in the proper position for a rider of large or small stature without requiring a separate horizontal adjustment. This construction also permits the front spring Q and its clamp Q′ to be adjusted on the steering post or head to locate the handles at any desired point above the saddle.

If desired, a ball-and-socket joint may be employed instead of the coupling R, or the coupling or joint may be omitted altogether and the strap s^2 be attached to a loop formed at the lower end of the front spring Q, which latter construction will also operate quite well.

In the modified construction illustrated in Fig. 10 my improved saddle is applied to an ordinary bicycle.

T is the steering-head; T′, the backbone or reach; T², the saddle, provided at its front end with a strap or loop, t, and t' is the rear spring of the saddle, attached with the lower ends of its branches to the backbone.

U represents the universal coupling, which is pivoted between two horizontal lugs, u u, formed on the rear side of the steering-head by a vertical bolt, u'.

v is the horizontal bolt of the coupling U, and V is a link, of rubber or other suitable elastic material, running around the horizontal bolt v and connected with the strap t of the saddle by a metallic loop or ring, v'. The metallic loop v' is molded into the rubber link V and the latter forms a spring for the front end of the saddle.

As bicycles are made of a suitable size to suit the rider, no vertical adjustment of the saddle is necessary.

I claim as my invention—

1. In a velocipede, the combination, with the main frame, a rear driving-wheel, and a front steering-wheel, of a bracket or support secured to the main frame, a bar or frame adjustably secured to said bracket and supporting the driving-gear, and a brace or braces pivoted with their rear ends to the frame of the driving-wheel, near the center of the latter, and secured with their front ends to said adjustable supporting-bar, the latter and its supporting-bracket being curved concentric with the pivot of said brace or braces, substantially as set forth.

2. The combination, with the front steering-

wheel, the rear driving-wheel, and the reach D, provided with a backward extension, E, forming a mud-guard for the driving-wheel, of a depending tube or bracket, F, secured with its upper end to the reach, and a supporting-bar, *f'*, adjustably secured in said depending tube and supporting the driving-gear, substantially as set forth.

3. The combination, with the front steering-wheel, the rear driving-wheel, and the reach, of a depending bracket, F, secured to the reach, a bar arranged in said bracket and supporting the crank-shaft and provided with a series of notches or recesses, and a transverse bolt attached to the depending bracket and engaging in one of said notches or recesses, substantially as set forth.

4. In a velocipede, the combination, with a journal bearing or box and its supporting-frame, of a screw-bolt held against longitudinal movement in one of said parts, and a screw-threaded lug or projection arranged on the other part and made laterally adjustable on the screw-bolt by turning the latter, substantially as set forth.

5. In a velocipede, the combination, with the fork or frame and a screw-bolt held against longitudinal movement in the fork, of a bearing-box provided with a lug having a threaded opening engaging with said screw-bolt, and means whereby the screw-bolt is held against turning after being adjusted, substantially as set forth.

6. In a velocipede, the combination, with the fork provided with perforated lugs *l' l²*, and a split lug, *l*, having a clamping-bolt, *m'*, of a bearing-box provided with lugs *k k*, and having screw-threaded openings, a screw-bolt, *m*, passing through the lugs of the fork and bearing-box and provided with an annular groove in which the clamping-bolt *m'* engages, substantially as set forth.

7. The combination, with the fork or frame and a screw-bolt held against lengthwise movement in said fork, of a bearing-box provided with a screw-threaded lug or lugs traversing said screw-bolt and arranged eccentrically on one side of the center of the bearing-box, whereby the position of the bearing-box on the bolt is changed upon reversing the box in the fork, substantially as set forth.

8. In a velocipede, the combination, with the two jointed or pivoted parts of the main frame, of a flexible saddle attached with one end to the front part of the main frame and with its opposite end to the rear part thereof, substantially as set forth.

9. In a velocipede, the combination, with the jointed or pivoted front and rear wheel-frames, of springs attached, respectively, to said front and rear frames, and a saddle suspended at both ends from said springs, substantially as set forth.

10. In a velocipede, the combination, with the pivoted or jointed front and rear wheel-frames, of a saddle attached with its ends to said front and rear frames, respectively, and capable of independent vertical adjustment at either end, substantially as set forth.

11. In a velocipede, the combination, with the two jointed or pivoted parts of the main frame, of a saddle attached at its rear end to the rear part of the main frame and at its front end to the front part of the main frame by a joint or coupling capable of adjustment toward and from the axial line of the pivot connecting the two parts of the main frame, substantially as set forth.

12. The combination, with the two jointed or pivoted parts of the main frame, of a saddle attached at its rear end to the rear part of said main frame, and a scroll or volute spring connecting the opposite end of the saddle with the front part of the main frame, substantially as set forth.

13. The combination, with the jointed or pivoted front and rear frames of a velocipede and a saddle, of a coiled spring supporting the rear end of the saddle and having its lower branches adjustably secured to the rear part of the main frame, and a volute or coiled spring supporting the front end of the saddle and adjustably secured to the front part of the main frame, substantially as set forth.

14. The combination, with the main frame, the inclined steering-head, and handle-bar post made vertically adjustable in the steering-head, of a saddle provided at its rear end with a coiled spring having inclined branches arranged parallel with the handle-bar post and adjustably secured to the main frame, a volute or coiled spring adjustably secured to the handle-bar post, and a universal joint or coupling connecting the front end of the saddle with said volute spring, substantially as set forth.

15. The combination, with the main frame, the steering-head, and the adjustable handle-bar post, of a saddle provided at its rear end with a coiled spring adjustably secured to the main frame and at its front end with a strap, a volute spring adjustably secured in a clamp secured to the handle-bar post, a coupling connecting said volute spring with the strap at the front end of the saddle and composed of a frame carrying a vertical bolt to which the branches of the volute spring are attached, and a horizontal bolt to which the strap of the saddle is attached, substantially as set forth.

Witness my hand this 4th day of February, 1888.

EMMIT G. LATTA.

Witnesses:
HERMAN RICE,
H. C. WILCOX.