

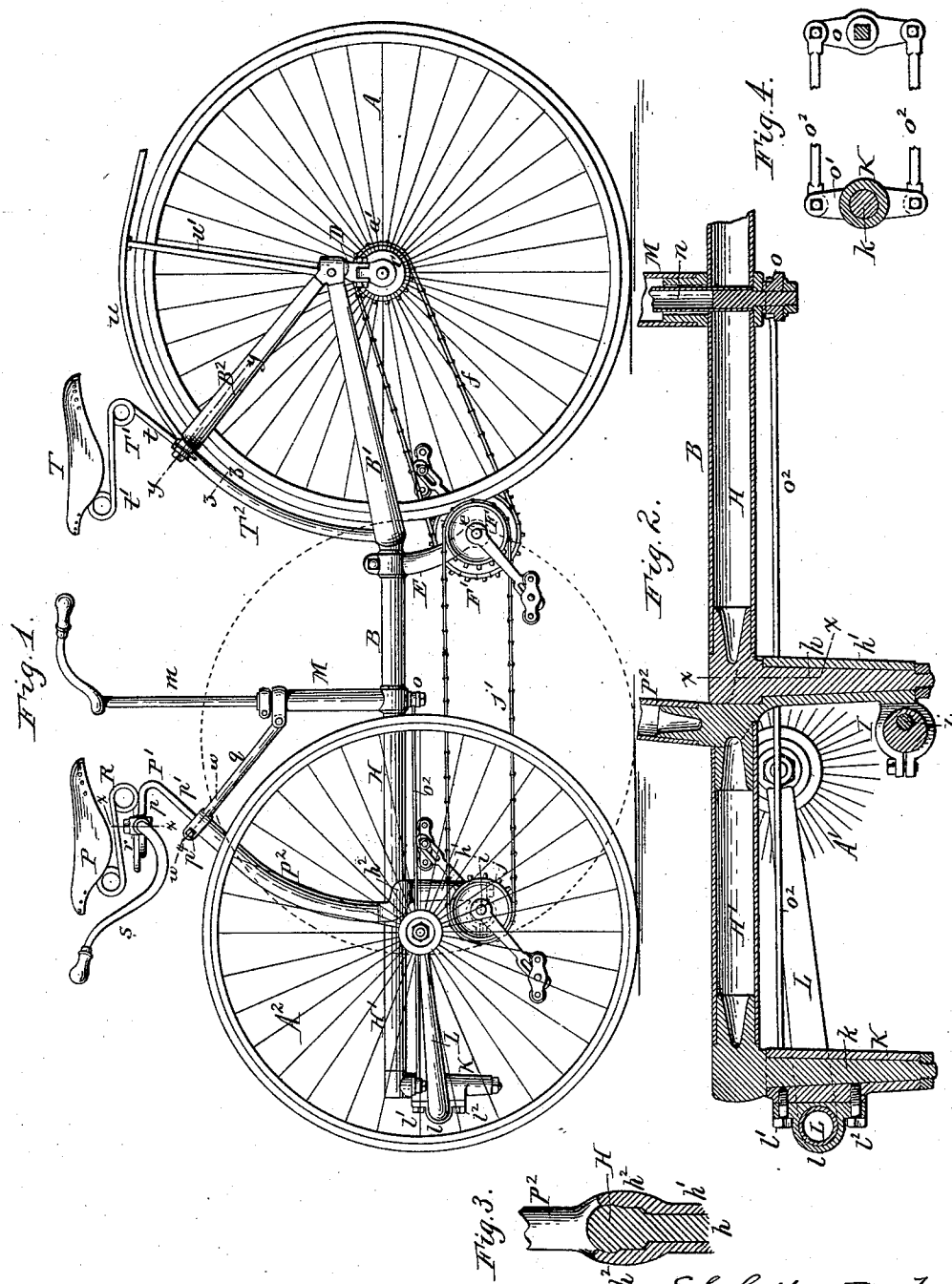
(No Model.)

3 Sheets—Sheet 1.

E. G. LATTA.
VELOCIPEDÉ.

No. 578,644.

Patented Mar. 9, 1897.



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

E. G. Latta Inventor.
By Wilhelm H. Bonner,
Attorneys.

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E. G. Latta Inventor.
By Wilhelm Honner.
Attorneys.

(No Model.)

3 Sheets—Sheet 3.

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Fig. 9.

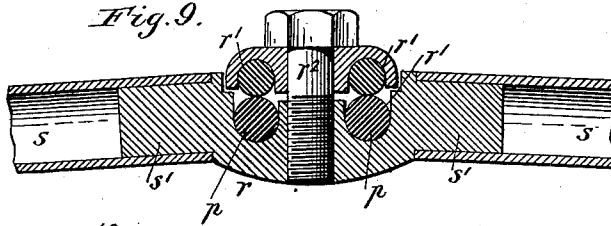


Fig. 10.

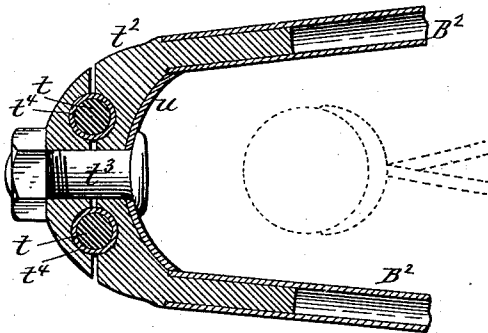


Fig. 11.

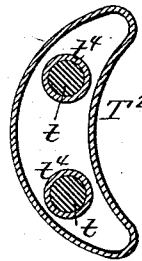


Fig. 13.

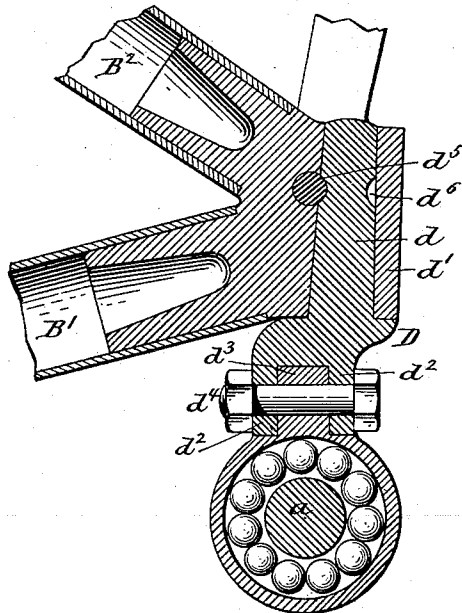
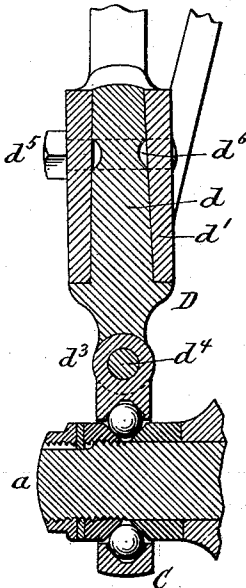


Fig. 12.



Witnesses:

Chas. Buchheit.
Theo. L. Popp.

E. G. Latta Inventor.
By Wilhelm Honner.
Attorneys.

UNITED STATES PATENT OFFICE.

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

VELOCIPEDÉ.

SPECIFICATION forming part of Letters Patent No. 578,644, dated March 9, 1897.

Application filed February 2, 1888. Serial No. 262,707. (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
5 useful Improvements in Velocipedes, of which the following is a specification.

The object of this invention is to produce a light and safe tricycle which can be readily converted from a tandem or double machine
10 to a single machine, which in its tandem form may be used by two ladies and in its single form shall be no more complicated than if it were constructed as a single machine only.

A further object of the invention is to provide a simple double driving-gear of variable speed and power; also to render the steering mechanism safer and more effective, and, finally, to improve the means whereby the driving-wheel bearings, the saddles, front
20 handle-bar, and mud-guard are secured to the frame of the machine.

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

25 In the accompanying drawings, consisting of three sheets, Figure 1 is a side elevation of my improved tricycle arranged in the form of a tandem or double machine. Fig. 2 is a vertical longitudinal section of a portion of the main frame thereof, on an enlarged scale. Fig. 3 is a cross-section in line *xx*, Fig. 2. Fig. 4 is an enlarged fragmentary sectional top plan view of the mechanism whereby the steering-post is connected with the steering-
35 head. Fig. 5 is a top plan view of the machine. Fig. 6 is a cross-section of the front-saddle support and its brace in line *ww*, Fig. 1, on an enlarged scale. Fig. 7 is a perspective view of the adjustable support or pillar of the front saddle. Fig. 8 is a side elevation of the removable frame, which is detached from the machine when the latter is converted into a single machine. Fig. 9 is a vertical cross-section, on an enlarged scale, of the clamp whereby the spring of the front
45 saddle is secured to the saddle-pillar, the section being taken in line *xx*, Fig. 1. Fig. 10 is a cross-section, on an enlarged scale, of the clamp connecting the rear-saddle support to the upper fork of the driving-wheel, the section being taken in line *yy*, Fig. 1. Fig. 11

is a cross-section, on an enlarged scale, of the rear-saddle support, in line *zz*, Fig. 1. Fig. 12 is a vertical longitudinal section of one of the bearings of the driving-wheel and the
55 coupling whereby it is connected to the main frame, on an enlarged scale. Fig. 13 is a vertical cross-section of these parts at right angles to Fig. 12.

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

A represents the rear driving-wheel; *a*, its axle, provided with a sprocket-wheel *a'*.

A' A² are the front steering-wheels, and B
65 is the main frame of the machine.

B' B² represent the forks of the rear wheel, C are the bearing-boxes thereof, and D are couplings connecting said bearings to the inner ends of the forks B' B².

e represents the rear crank-shaft, journaled
70 in bearings formed at the lower end of an arm or bracket E, which is adjustably secured to the main frame B.

F F' represent two sprocket-wheels mounted upon the crank-shaft *e* and made of different diameters, and *f* is an endless chain running around the sprocket-wheel *a'* and one of the sprocket-wheels F F'.

The couplings D each consist of an upright stud or spindle *d*, which fits into an opening
80 or socket *d'*, arranged in a forging or enlargement formed at the junction of the inner ends of the forks B' B², and two vertical lugs or ears *d*², which embrace a lug *d*³, formed at the upper end of each bearing-box C, said lugs
85 being connected by a horizontal pivot-bolt *d*⁴, as shown in Figs. 12 and 13. The sockets *d'* are held upon the spindles *d* by horizontal pins or bolts *d*⁵, passing through openings in the sockets and engaging in annular grooves
90 or depressions *d*⁶, formed in the spindles. This construction permits the spindles *d* to turn on the bolts *d*⁵ to align the bearing-boxes C on the axle if one arm of the lower fork B' should be slightly longer than the other, and
95 the horizontal bolts *d*⁴ allow of the necessary lateral play of the bearing-boxes to enable the latter to assume a perpendicular position if one of the fork-arms is higher than the other.

The vertical spindles *d* are offset or located
100 on one side of a line drawn through the center of the bearing-boxes, so that upon revers-

ing the driving-wheel bearings the distance between the sprocket-wheels a' and $F F'$ will be increased, which enables the same drive-chain to connect the wheel a' with either wheel $F F'$, as may be necessary to obtain the desired relative speed. For this purpose the spindles d are offset from the center of the bearings C a distance about equal to the difference between the diameters of the sprocket-wheels $F F'$. In the position of the parts represented in Fig. 1 the large wheel F' is connected with the sprocket-wheel a' .

The wheels $F F'$ are secured to opposite ends of the crank-shaft e at about equal distances from the longitudinal center line of the machine, so that the wheel a' can be connected with either one of the wheels $F F'$ by reversing the driving-wheel A when used as a single machine or by reversing the crank-shaft. The chain f is tightened by adjusting the bracket E on the main frame B .

The main frame B consists of two detachable tubular sections or parts $H H'$. The section H is rigidly secured with its rear end to the lower fork B' and is provided at its front end with a depending upright spindle or shank h . The section H' is provided at its rear end with a vertical socket or sleeve h' , which fits over the spindle h of the section H and is secured thereto by a nut applied to the lower end of said spindle. The sleeve h' is rigidly held against turning on the spindle h by vertical lips or flanges h^2 , formed on the rear section H' and bearing against opposite sides of the front section, as shown in Fig. 3.

i is the front crank-shaft, which is mounted in eccentric bearings formed in brackets I , arranged at the lower ends of the sleeve h' . j is a sprocket-wheel secured to the crank-shaft i , and j' is a chain running around the sprocket-wheel j and one of the sprocket-wheels $F F'$. In the construction shown in the drawings the chain j' passes around the small wheel F and the chain f runs around the large sprocket-wheel F' . The sprocket-wheels $F F'$ form with the wheel a' a two-speed gear, and with the wheel j a double driving-gear for two riders. The wheels F and j are preferably of equal size, so that the riders keep step, and as the wheels $F F'$ are both secured to the same crank-shaft the wheel F transmits the power of both riders to the wheel a' . The front chain j' is adjusted by turning the eccentric bearings in the brackets I .

A very powerful gear is obtained by connecting the wheel j with the wheel F' and the wheel a' with the wheel F . This arrangement requires the front rider to pedal faster than the rear rider, which is in some cases desirable. The sprocket-wheels F, F' , and j are secured to their crank-shafts e and i in such a manner that, if desired, the wheels F' and j may be interchanged, which gives the driving-wheel A the same peripheral speed as if its sprocket-wheel a' were connected to the wheel F and enables the front rider to pedal

slower than the rear rider. This arrangement is sometimes desirable when a lady occupies the front seat.

k represents the vertical spindle arranged at the front end of the section H' , and K is the steering-head arranged upon the spindle and held thereon by a nut applied to the lower screw-threaded end of the spindle, as clearly shown in Fig. 2.

L represents a horizontal bow or curved tubular frame rigidly secured to a bracket or socket l , which is in turn secured to an oblong or oval enlargement formed on the front side of the steering-head by means of two horizontal bolts $l' l^2$. The journals of the steering-wheels $A' A^2$ are secured to or formed at the outer ends of the frame L . By giving this frame L a curved form the axles of the steering-wheels are located behind the steering-head, which renders the machine safer in turning than it would be if the steering-head were arranged in line with the axles of the steering-wheels. It also permits the machine to be built narrower. It is obvious that the same result will be obtained by making the branches of the frame straight from the steering-head to the steering-wheels, but I prefer to curve it, so as to provide ample room for the feet and legs of the front rider, as well as to contract the length of the wheel-base over what that length would be were the axles straight, and as is clearly apparent in Fig. 5 of the drawings.

M represents the upright steering-post, secured with its lower end to the section H of the main frame B , and m represents the handle-bar post, to the upper end of which the handle-bars are secured.

n is a short tube arranged in the steering-post M , and in which the handle-bar post is adjustably secured by a suitable clamp. The tube n passes through the section H of the main frame and is provided at its lower end with a cross head or bar o . The steering-head K is provided with a similar cross-head o' , which is connected with the cross-head o by connecting-rods o^2 , so that by turning the handle-bar post by means of the handle-bars in either direction this movement is transmitted to the steering-wheels.

P represents the front saddle, P' its pillar or supporting-frame, and P^2 the supporting-tube in which the saddle-pillar is adjustably arranged. The lower end of the tube P^2 is rigidly secured to the section H' of the main frame B , and its upper end is connected with the upper end of the steering-post M by a brace q . The upper end of this brace is united with the tube P^2 by a forging q' , which is provided with a stub or projection fitting into the tubular brace q . The tube P^2 is curved upwardly and backwardly for about two-thirds of its length, while its upper portion, which receives the saddle-pillar P' , is straight. The saddle-pillar P' consists of two horizontal legs $p p$, connected at their front ends and provided with inclined or angular branches

or extensions $p' p'$, as shown in Fig. 7. The lower ends of these branches are adjustably secured in openings p^2 , formed in the forging q' , which latter is split from these openings to its front side and provided with two lugs or ears p^3 , through which passes a clamping-bolt p^4 , as represented in Fig. 6. The lower ends of the branches p' project into the tube P^2 and are concealed by the latter.

R represents the spring of the front saddle, which is secured to the horizontal legs $p p$ of the saddle-pillar by a clamp r . The latter is composed of an upper and a lower plate provided in their adjacent portions with grooves or depressions r' , in which the branches of the saddle-spring and the legs $p p$ are seated, and a vertical clamping-bolt r^2 , connecting these grooved plates, as shown in Fig. 9.

s represents the front handle-bars, which are preferably made tubular and secured to lateral projections s' , formed on opposite sides of the clamp r . This clamp permits the spring R and the handle-bars to be adjusted forwardly and backwardly on the saddle-pillar independently of each other or together, as may be desired. By arranging the branches p' of the saddle-pillar at an angle to the horizontal legs p the front seat can be adjusted vertically and at the same time backwardly and forwardly to suit the average rider.

The saddle-pillar P' is preferably constructed of a single length or rod of steel. It is light, cheap, and slightly elastic, and, being double, it prevents the saddle from turning or twisting.

T represents the rear saddle, T' the pillar, and T^2 a curved supporting-tube secured with its lower end to the section H , and in which the saddle-pillar is adjustably secured. The saddle-pillar is composed of two branches or legs $t t$, which are formed in one piece with the saddle-spring t' and are arranged with their lower ends in sockets or openings formed in a forging t^2 , secured to the upper end of the fork B^2 . The forging t^2 and the upper end of the tube T^2 are split, as shown in Fig. 10, and a clamping-bolt t^3 passes through these parts, whereby the branches of the saddle-pillar T' are secured in said forging.

If desired, the saddle pillar and spring of the rear saddle may be constructed like those of the front saddle, but I prefer the construction above described, as the handle-bars are not attached to the saddle-frame, as in the construction of the front saddle. The tube T^2 is curved concentric with the rear wheel A and forms a mud-guard for the same.

u is an upward and rearward extension of the tube or mud-guard T^2 , extending rearwardly beyond the center of the wheel A . The rear portion of this extension u is supported by bars or braces u' , secured with their lower ends to the fork B^2 , and is secured at its front end to the forging t^2 . This extension is constructed of sheet metal and preferably made of semicircular cross-section, as shown

in Fig. 10, and is made of about the same width as the tube T^2 of the mud-guard.

The extension u of the mud-guard being arranged in rear of the saddle is subjected to little strain and can therefore be made lighter and at less expense than if the tube T^2 were extended backwardly sufficiently to take the place of the extension u .

The lower ends of the branches t are each inclosed by a small tube or sleeve t^4 , as shown in Figs. 10 and 11, to prevent the same from bending and to enable the holes in the forging t^2 to be made of the same size as those in the forging q' , so that a double saddle-pillar and separate spring like that of the front saddle may be employed for the rear saddle, if desired.

When it is desired to convert the tandem or double machine into a single tricycle, the front section H' of the main frame B , with its connecting parts, (shown in Fig. 8,) and the drive-chain j' and connecting-rods o^2 , are detached from the machine by removing the nut at the lower end of the front spindle k and the bolt at the lower end of the brace q . The steering-head K is then attached to the spindle h , arranged at the front end of the section H , and the cross-heads $o o'$ are connected by a shorter pair of connecting-rods. This arrangement brings the steering-wheels $A' A^2$ into the position represented by dotted lines in Fig. 1.

To pass the machine through a doorway or passage which is narrower than the machine, the upper bolt l' of the bracket l is removed and the bow or frame L is turned into a vertical position upon the lower bolt l^2 as a pivot. The steering-wheels will then stand horizontally, which considerably reduces the width of the machine.

A less expensive construction may be obtained by rigidly securing the frame L to the steering-head K and attaching the connecting-rods o^2 directly to the frame L . In this case the machine could be narrowed by removing the steering-head from its spindle, but this requires the connecting-rods to be detached in addition to the nut l' , or, in other words, the construction requires the removal of three nuts instead of a single nut, as in the first-described construction.

I claim as my invention—

1. In a velocipede, the combination with two front steering-wheels and a single rear driving-wheel and its axle provided with a sprocket-wheel, of two crank-shafts arranged in front of said rear wheel and provided with sprocket-wheels connected by a drive-chain arranged on one side of the center of the machine, and a drive-chain connecting the sprocket-wheel of the rear driving-wheel with the sprocket-wheel of one of said crank-shafts and arranged on the opposite side of the center of the machine, substantially as set forth.

2. The combination with the axle of the rear driving-wheel provided with a sprocket-wheel, and a crank-shaft provided with two

sprocket-wheels of different diameters, of the main frame provided with a socket or opening, a bearing-box provided with a spindle engaging in said socket and arranged on one side of the center of the bearing-box, whereby the distance between the sprocket-wheels of the axle and crank-shaft can be varied by reversing the driving-wheel in the main frame, and either sprocket-wheel of the crank-shaft can be connected with the sprocket-wheel of the axle by the same drive-chain, substantially as set forth.

3. The combination with the main frame of a velocipede provided with a socket or opening, of a bearing-box provided with an eccentric spindle engaging in said socket and a horizontal pin or bolt secured to the main frame and engaging in an annular groove or recess formed in said spindle, substantially as set forth.

4. The combination with the main frame, a single rear driving-wheel and two front steering-wheels, of a horizontal frame or bar connecting said steering-wheels and capable of being turned into a vertical position, to reduce the width of the machine, substantially as set forth.

5. In a velocipede, the combination with the main frame, a rear driving-wheel and a crank-shaft, of two front steering-wheels arranged outside of said crank-shaft, and a

curved frame connecting said steering-wheels and attached to the main frame and composed of two arms passing outwardly from the main frame and extending rearwardly outside of the orbits or circles described by the cranks, substantially as set forth.

6. In a velocipede, the combination with a rear driving-wheel and two front steering-wheels, of a main frame provided at its front end with a spindle, an auxiliary frame provided at its rear end with a socket adapted to fit over said spindle, and at its front end with a spindle, a frame or bar connecting the front steering-wheels, and a steering-head attached to said frame or bar, and adapted to be applied either to the spindle of the main frame or to the spindle of the auxiliary frame, substantially as set forth.

7. The combination with the main frame, composed of a front section provided at its rear end with a socket or sleeve and a rear section having a spindle, of a saddle-support secured to said front section and a crank-shaft bracket attached to said sleeve or socket, substantially as set forth.

Witness my hand this 30th day of January, 1888.

EMMIT G. LATTA.

Witnesses:

HERMAN RICE,
H. C. WILCOX.