(No Model.) 2 Sheets—Sheet 1.

# E. G. LATTA.

## VELOCIPEDE.

No. 327,399. Patented Sept. 29, 1885.

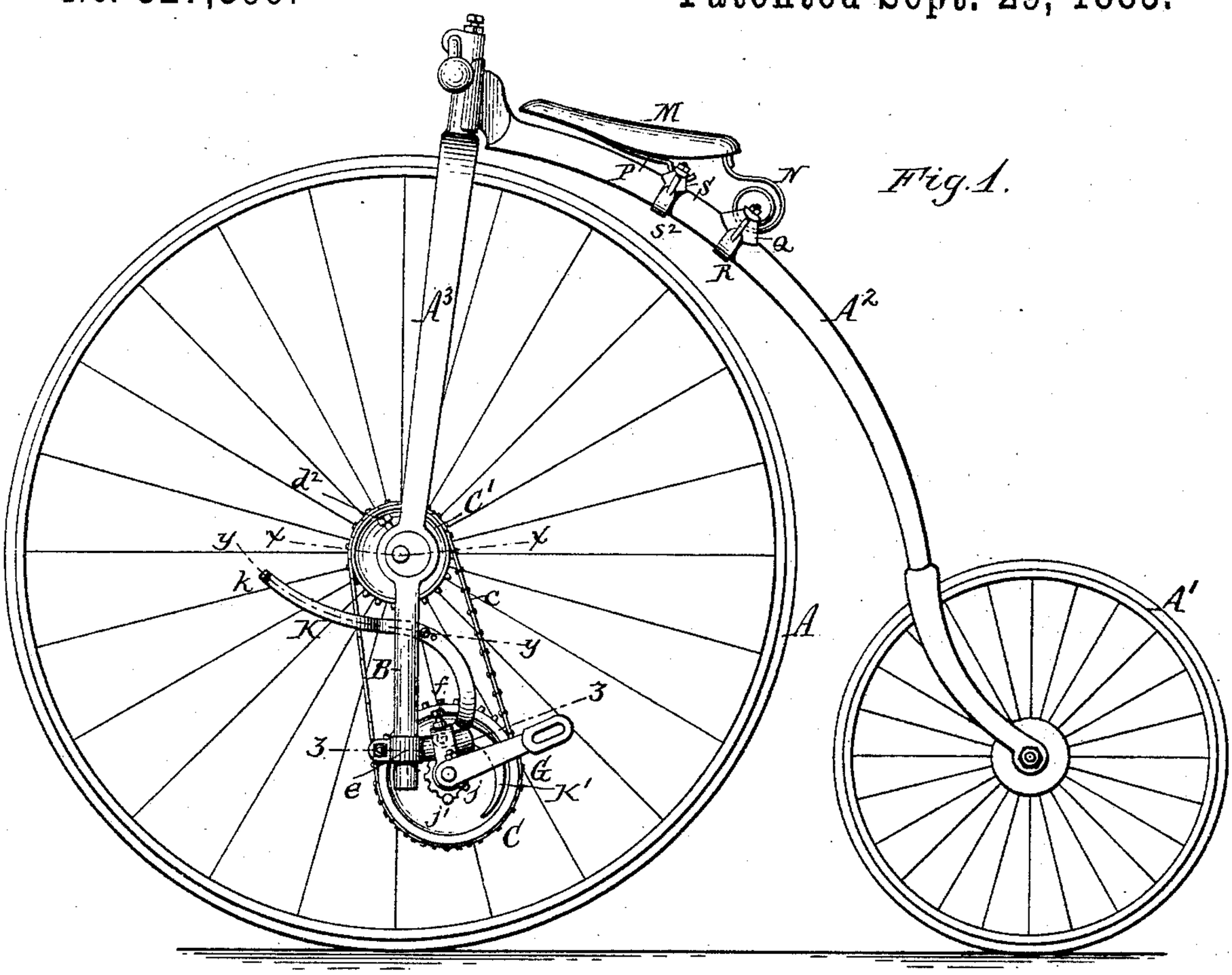



Fig. 1.

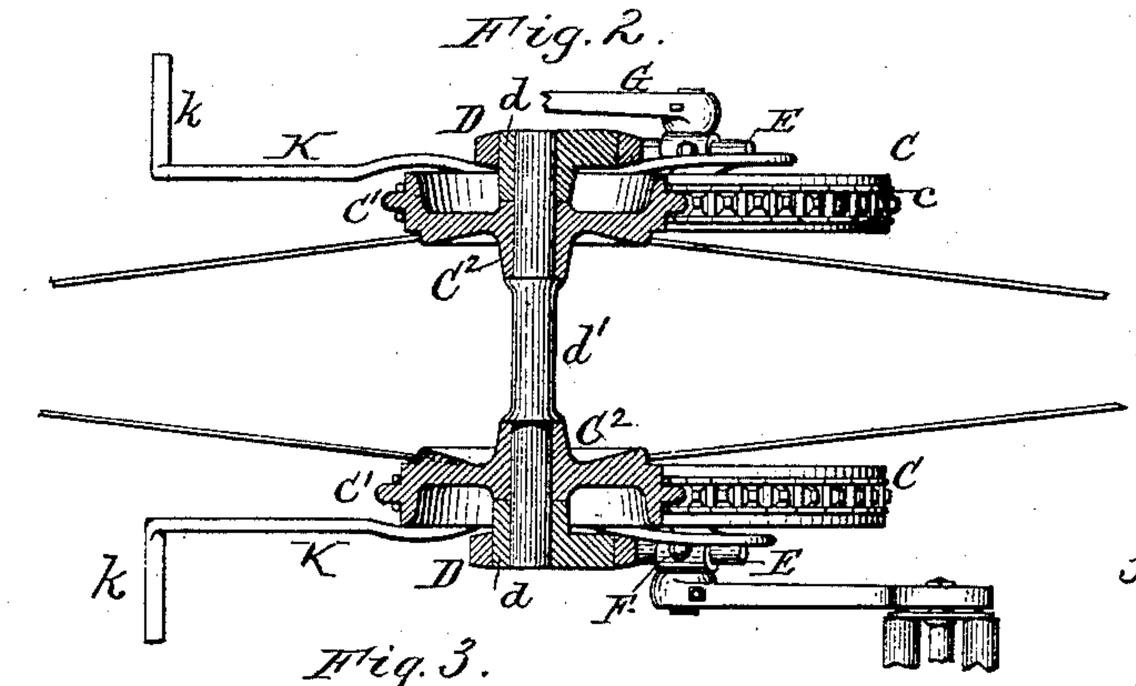



Fig. 2.

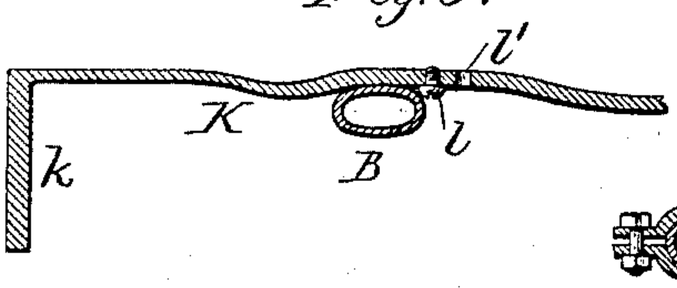



Fig. 3.

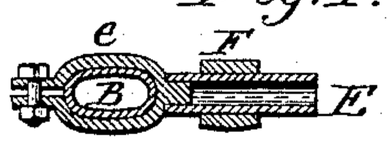



Fig. 4.

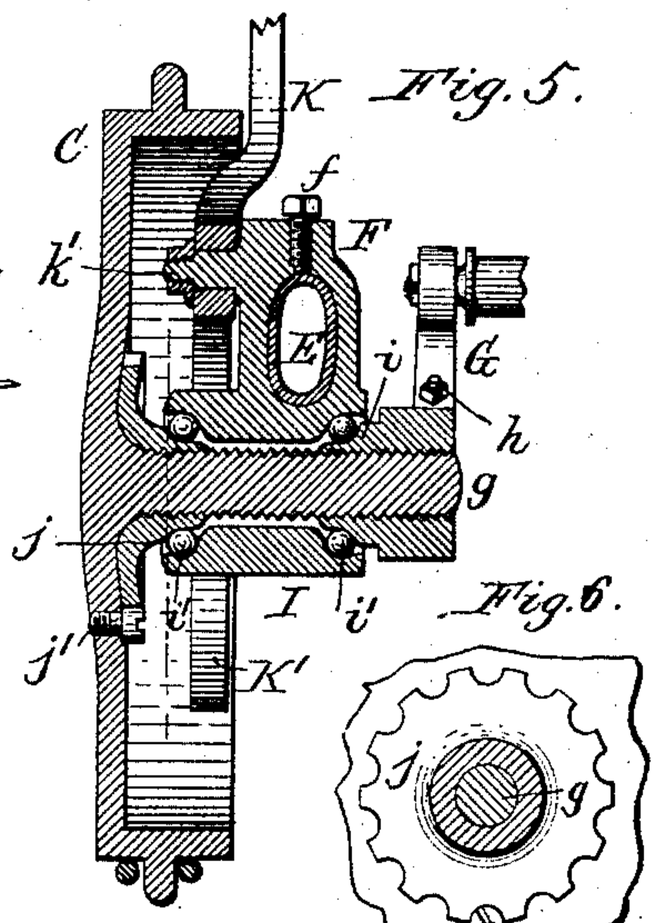
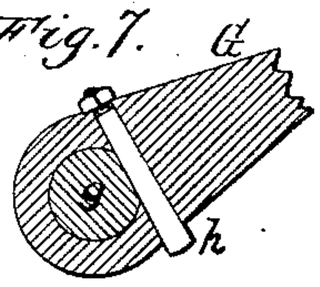



Fig. 5.




Fig. 6.

Fig. 7.

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(No Model.) 2 Sheets—Sheet 2.

# E. G. LATTA.

## VELOCIPEDE.

No. 327,399. Patented Sept. 29, 1885.

Fig. 9.

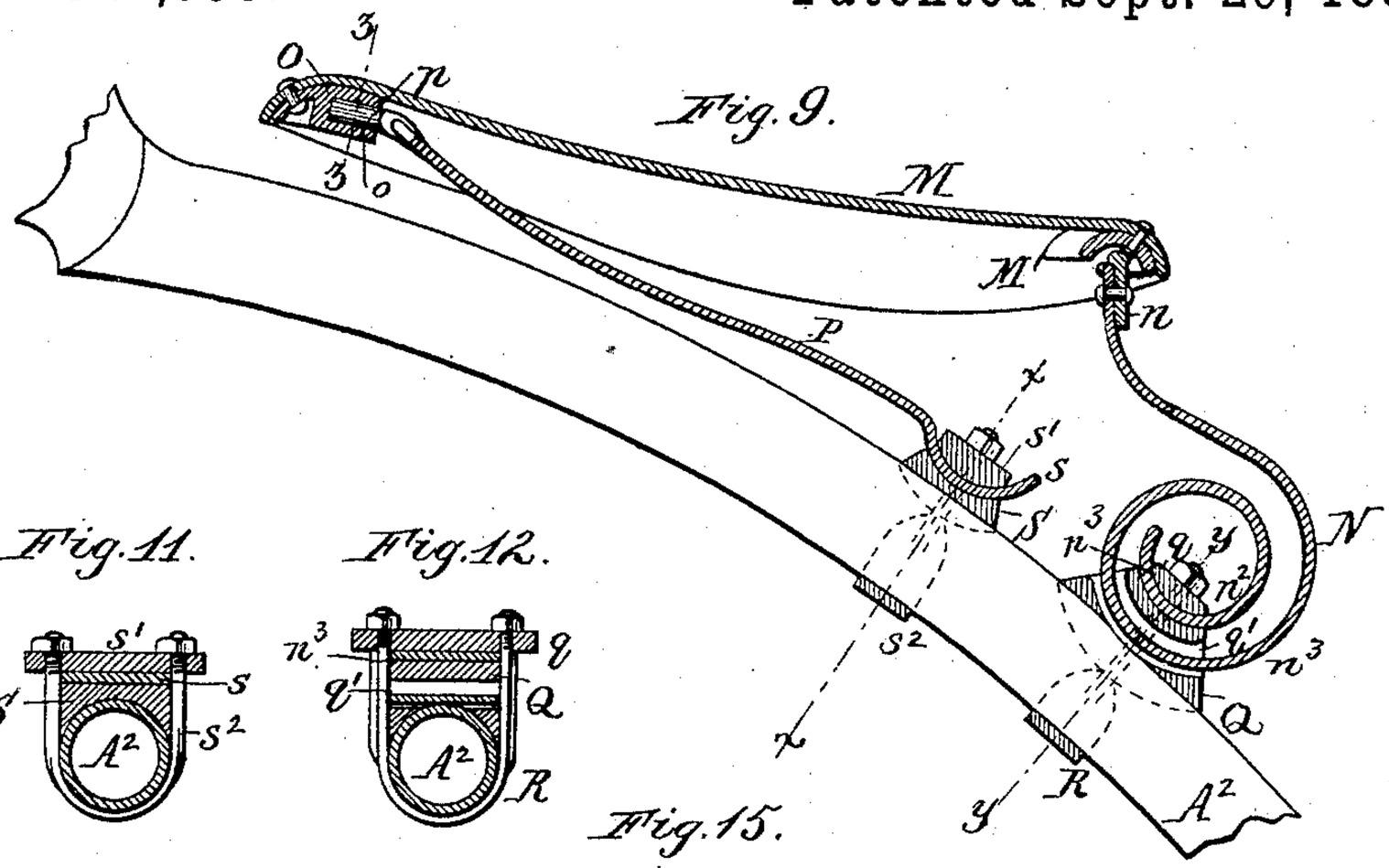



Fig. 11.




Fig. 12.




Fig. 13.

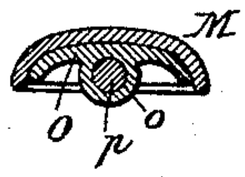




Fig. 10.




Fig. 14.

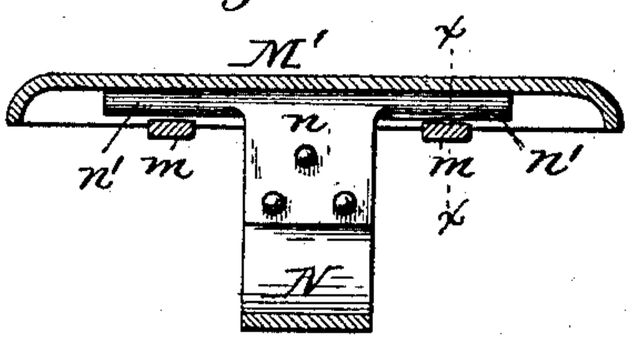
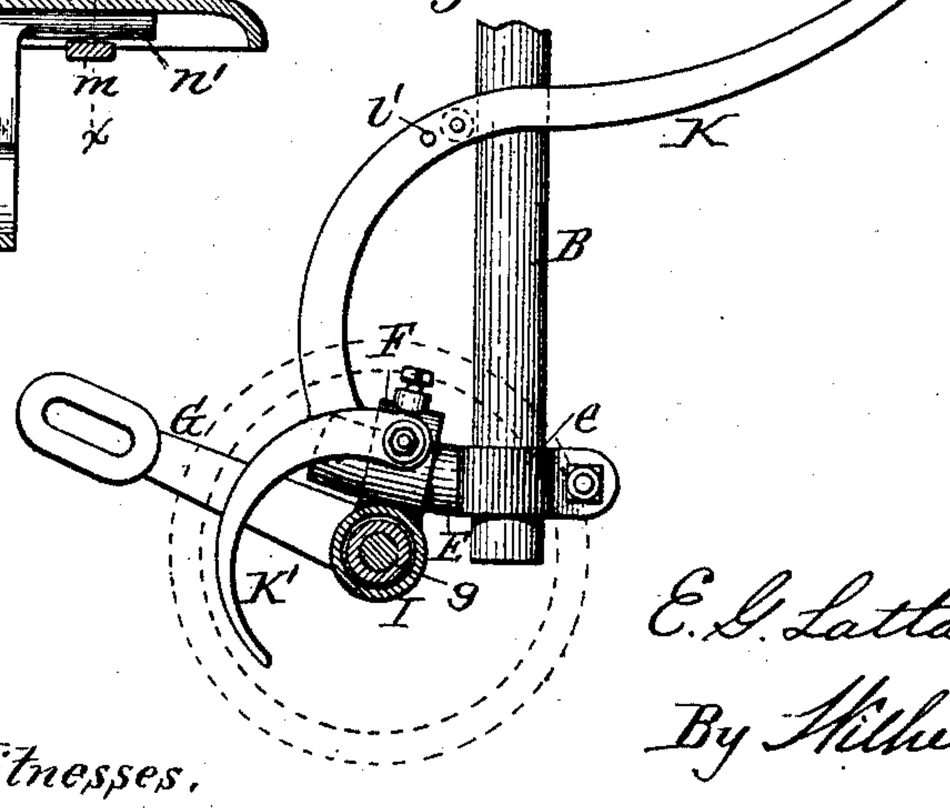



Fig. 8.

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By Wilhelm Bonner
Attorneys.

N. PETERS, Photo-Lithographer, Washington, D. C.

# UNITED STATES PATENT OFFICE.

EMMIT G. LATTA, OF FRIENDSHIP, NEW YORK, ASSIGNOR OF ONE-HALF TO ADRIAN C. LATTA, OF SAME PLACE.

## VELOCIPEDE.

SPECIFICATION forming part of Letters Patent No. 327,399, dated September 29, 1885.

Application filed March 31, 1885. (No model.)

*To all whom it may concern:*

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

The object of this invention is to provide a simple device for adjusting the driving-wheel in the fork-arms; also, to provide a simple device for adjusting the crank-wheels, to which power is primarily applied, and from which it is transmitted to the driving-wheel by endless chains; also, to provide the crank-wheels with a ball-bearing which can be readily adjusted for wear, and which will permit the crank-wheels to be readily aligned with the chain-wheels on the hub of the driving-wheel; also, to provide the machine with a safe and effective brake; also, to provide the machine with a saddle which may be adjusted for riders of different sizes, and which can be readily raised at either end and adjusted forwardly or backwardly on the perch, and be readily removed from the machine, if desired.

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

In the accompanying drawings, consisting of two sheets, Figure 1 is a side elevation of a bicycle provided with my improvements. Fig. 2 is a horizontal section, on an enlarged scale, in line *x x*, Fig. 1. Fig. 3 is a horizontal section of the foot-lever, on an enlarged scale, in line *y y*, Fig. 1. Fig. 4 is a horizontal section of the support of the crank-wheel, on an enlarged scale, in line *z z*, Fig. 1. Fig. 5 is a cross-section, on an enlarged scale, of one of the crank-wheels and supporting parts. Fig. 6 is a face view of the cone applied to the crank-wheel. Fig. 7 is a cross-section through the crank-boss. Fig. 8 is a side elevation of the brake on an enlarged scale. Fig. 9 is a longitudinal section of the saddle. Fig. 10 is a top plan view thereof with the leather cover of the saddle shown in dotted lines. Figs. 11, 12, and 13 are cross-sections in lines *x x*, *y y*, and *z z*, Fig. 9, respectively. Fig. 14 is a cross-section in line *x x*, Fig. 10. Fig. 15 is a cross-section in line *x x*, Fig. 14.

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

A represents the driving-wheel; A′, the rear wheel; $A^2$, the perch, and $A^3$ the fork of the driving-wheel.

B represents an arm extending downwardly from the lower end of each fork below the center of the driving-wheel.

C represents the crank-wheels, *c* the endless chains, and C′ the chain-wheels formed on the hub of the driving-wheel.

D represents a circular frame or lug, formed at the junction of each fork-arm with the arm B, and *d* represents the bearings of the axle, which are seated in the frames D and capable of turning therein.

*d′* represents the axle to which the hubs $C^2$ of the driving-wheel are secured, and which are journaled in the bearings *d* in any suitable manner. Plain cylindrical bearings are shown in the drawings, but ball-bearings of ordinary and well-known construction are preferably employed. The journals of the axle *d′* are arranged eccentrically in the bearings *d*, so that by turning the bearings in the circular frames D the axle and the driving-wheel attached thereto can be adjusted forwardly or backwardly, or up and down, as may be desired. The bearings *d* are secured in the frames D by set-screws $d^2$ after the bearings have been adjusted. By this means the driving-wheel may be arranged forwardly in the fork, as represented in Fig. 1, for greater safety in descending hills or in riding over rough roads, or backwardly for better control on good roads, or better application of power in traveling uphill, and the driving-wheel may be raised or lowered in the fork for adjusting the drive-chains, as may be desired. The balls of the bearing may be arranged between the box *d* and the journals of the axle, or separate bearing-boxes may be secured in the boxes *d* if desired. This eccentric box is equally desirable

in ordinary bicycles for the purpose of shifting the driving-wheel and increasing or decreasing the rake of the machine.

E is an arm, which extends rearwardly from the arm B, and is secured thereto by a clamp-sleeve *e*, so as to be vertically adjustable on the same.

F is a bracket or support, which is attached to the arm E, and which supports the crank-wheel and brake mechanism. The bracket F is adjustable forwardly and backwardly on the arm E, so that the crank-wheel can be adjusted forwardly or backwardly, if desired, and is secured to the arm E by a set-screw, *f*, when adjusted. By raising and lowering the arm E on the arm B the tension of the driving-chain is adjusted. The arm E is of the same form in cross-section as the arm B, so that the bracket F can be directly applied to the arm B upon removing the arm E. By this means the crank-wheel can be placed in its extreme forward position.

It is obvious that the arm E may be reversed upon the extension B, so as to project forwardly from the latter, and this may be desirable when the extension B is not perpendicular, but has a certain backward inclination.

For a less expensive construction the arm E can be made in one piece with the arm B, when the drive-chain is adjusted by the eccentric bearing-box *d*.

*g* represents the shaft or axle of the crank-wheel C, made in one piece therewith and provided with an external screw-thread throughout its length.

G represents the crank, secured to the outer end of the axle *g* by means of an internally screw-threaded hub and a key, *h*.

I represents the bearing-box, formed on the bracket F, *i* the cone formed on the inner side of the hub of the crank G, and *j* the cone secured to the outer side of the web or plate of the crank-wheel C around the axle *g*. The web or plate of the crank-wheel is formed near the edge of its rim, in order to afford a long bearing for its axle in the box I.

*i'* represents the balls interposed between the box I and the cones *i* and *j*. This construction locates the two rows of balls comparatively far apart, and is more compact than the usual construction, as well as cheaper and more rigid. The bearing is adjusted by turning the cone *j* on the screw-threaded shaft as far as is necessary, and then securing it in position by a set-screw, *j'*, which taps into the web of the crank-wheel, and engages with its head in one of a number of notches with which the periphery of the flange of the cone *j* is provided, as represented in Figs. 5 and 6. If it is found, after several adjustments, that the crank-wheel is out of line with the chain-wheel on the axle *d'* of the driving-wheel, the key *h* is removed, and the crank is turned on the axle *g* until the chain-wheels are in line, when the key is again inserted and the crank secured.

K represents the brake-levers, provided at their forward ends with foot-rests *k*, and pivoted to the brackets F by bolts or studs *k'*, projecting inwardly from said brackets into the depressions in the chain-wheels.

K' represents the short arm of the brake-lever, which forms the brake-shoe, and bears, when the brake is tightened, against the inner side of the crank-wheel C.

*l* represents a small screw or projection, secured in one of several openings, *l'*, formed in the brake-lever K, and bearing against the rear side of the arm B, so as to support the brake-lever in a position in which the brake-shoe K' clears the crank-wheel when it is not desired to apply the brake, the support afforded by the projection *l* being sufficient to permit the foot to be supported on the foot-rests without applying the brake. When it is desired to apply the brake, the levers K are sprung inwardly by a pressure against the foot-rests until the stops *l* pass by the arms B, when a downward pressure of the foot-rests applies the brake. By combining the brake with the crank-wheel the pressure is applied below the center of the driving-wheel, which prevents the machine from turning over forwardly when the brake is applied, and enables the machine to be held in check on steep grades with safety. The tightening of the brake is also less tiresome to the rider than in a brake applied by hand, especially in coasting down long hills. The spring of the brake-levers holds these levers against the arms B with sufficient force to prevent noise.

In order to release the brake the foot-levers are raised by an upward pressure under the foot-rests, or, if desired, a retracting-spring may be connected with the brake-levers. The latter may be arranged to project backwardly of the arms B, instead of in front of the same, as shown; in which case the rider may bring the machine to a sudden stop without danger of being thrown forward; but such an arrangement of the brake-lever is not as desirable as the one shown.

M represents the cover or seat of the saddle, which may be constructed of leather or other flexible material.

M' is the metallic stretcher or transverse plate, to which the rear end of the seat M is fastened in the usual manner.

*m m* represent hooks formed on the under side of the stretcher M' on both sides of the center line of the saddle.

N represents the spring whereby the rear end of the saddle is supported, and *n* represents a cross-head secured to the upper end of the spring N, and provided with laterally-projecting pivots *n'*, which engage with the hooks *m m* of the seat. The hooks *m* open

forwardly, as shown in Fig. 15, so that the saddle can be disconnected from the pivots $n'$ by a forward movement of the cross head $n$, which can be easily effected by pushing the upper end of the spring N forwardly. The pivots $n'$ and hooks $m$ form hinges on both sides of the spring N, which permit the saddle to keep its proper position when the spring is compressed and prevent the rear portion of the saddle from tipping sidewise.

O is a metallic plate or support, which is riveted to the under side of the front end of the seat M, and provided with a central socket, $o$, opening rearwardly.

P represents a spring, which supports the front end of the saddle, and is provided at its front end with a pivot, $p$, which engages in the socket $o$. Upon disconnecting the cross-head $n$ from the stretcher M', the seat can be moved forwardly, so as to disengage the socket $o$ from the pivot $p$, and in this manner the saddle can be quickly detached from the machine when desired—for instance, when the machine is left out in the rain, or when the machine is left in a place where it might be used by other persons.

The lower portion of the spring N is coiled, as represented in Fig. 9, and secured to the perch $A^2$ by a bracket, Q, which rests against the upper side of the perch. The inner coil, $n^2$, of the spring N rests against the upper concave side, $n^3$, of the bracket Q, and is secured thereto by a cross-piece, $q$, which is held in place by a clip, R. The latter straddles the perch and its legs pass through recesses in the sides of the bracket Q, so that upon tightening the screw-nuts at the ends of the clip the bracket is secured to the perch and the spring to the bracket. Upon loosening the clip the bracket can be moved forwardly and backwardly on the perch, thereby adjusting the saddle forwardly or backwardly, and the spring can be turned in its seat in the bracket, thereby throwing the upper end of the spring forwardly or backwardly, as may be desired. The bracket is provided with a curved slot or opening, $q'$, through which the outer coil, $n^3$, of the spring passes loosely, so as to permit the spring to play freely.

Instead of constructing the spring of a flat bar of steel, as shown, it may be bent of a single length of wire having its center portions bent to form the cross-bead $n$, and its parallel ends bent to form the scroll-spring.

It is obvious that a spring with a single coil may be used instead of the double coil which is shown in the drawings.

The rear end, $s$, of the spring-arm P is curved, as shown in Fig. 9, and secured to a bracket, S, by a cross-piece, $s'$. The bracket S is secured to the perch by a clip, $s^2$, which also serves to hold the cross-piece $s'$ against the curved end of the spring P, and the latter against the bracket.

By loosening both clips R and $s^2$ the saddle can be raised or lowered at both ends to suit different riders, or it may be adjusted forwardly or backwardly on the perch to any desired position, while, by moving the clips toward or from each other on the perch, any desired tension may be given to the seat. By separating the clips on the perch the spring N is compressed and its tension increased.

For a less expensive construction the front end of the spring P may be riveted to the front end of the seat, and, if desired, the spring N may be used with a seat, the front end of which is secured to the neck of the perch, thereby dispensing with the supporting-spring P.

The hooks $m$ and pivots $n'$ at the rear end of the seat, and the pivot $p$ and socket $o$ at the front end of the seat, constitute slip-joints, which open inwardly or toward each other and permit the ready attachment and removal of the seat, as described.

I claim as my invention—

1. The combination, with the fork $A^3$, provided with an extension, B, of an arm, E, projecting rearwardly from the extension B, and a crank-wheel support, F, adjustably secured to the arm E, substantially as set forth.

2. The combination, with the fork $A^3$, provided with an extension, B, of an arm, E, made vertically adjustable on the extension B and projecting therefrom, and a crank-wheel support, F, adjustably secured to the arm E, substantially as set forth.

3. The combination, with the crank-wheel arranged below the center of the driving-wheel, of a brake adapted to be tightened against the crank-wheel, substantially as set forth.

4. The combination, with the crank-wheel arranged below the center of the driving-wheel, of a brake adapted to be tightened against the crank-wheel and a foot-lever whereby the brake is operated, substantially set forth.

5. The combination, with the fork, of a brake-lever provided with a stop which supports the brake-lever and adapts the same for use as a foot-rest, substantially as set forth.

6. The combination, with the fork provided with an extension, B, of an arm, E, bracket F, crank-wheel C, and brake-lever K, pivoted to the bracket F, substantially as set forth.

7. The combination, with the crank-wheel C, provided with an axle, $g$, of a bearing-box, I, an inner adjustable cone, $j$, and a crank, G, provided with a cone, $i$, and secured to the outer end of the axle by a screw-thread and key, substantially as set forth.

8. The combination, with the fork provided with circular frames D, of bearings $d$

seated in said frames and capable of being turned therein, and the axle $d'$, eccentrically journaled in the bearings $d$, substantially as set forth.

9. The combination, with the fork provided with circular frames D, of circular bearings $d$, seated in said frames, a driving-wheel, A, having its axle journaled eccentrically in the bearings $d$, and provided with chain-wheels C', crank-wheels C, and drive-chains $c$, substantially as set forth.

10. The combination, with the perch and saddle, of the scroll-spring N and the supporting bracket Q, provided with a curved seat, $n^3$, to which the curved end of the spring is adjustably secured, substantially as set forth.

11. The combination, with the perch and saddle, of the scroll-spring N, the supporting-bracket Q, provided with a curved seat, $n^3$, and slot $q'$, and a clip, R, substantially as set forth.

Witness my hand this 24th day of March, 1885.

EMMIT G. LATTA.

Witnesses:
HERMAN RICE,
W. WARD RICE.