

(No Model.)

3 Sheets—Sheet 1.

H. LA CASSE.

TRICYCLE.

No. 389,517.

Patented Sept. 11, 1888.

Fig. 1.

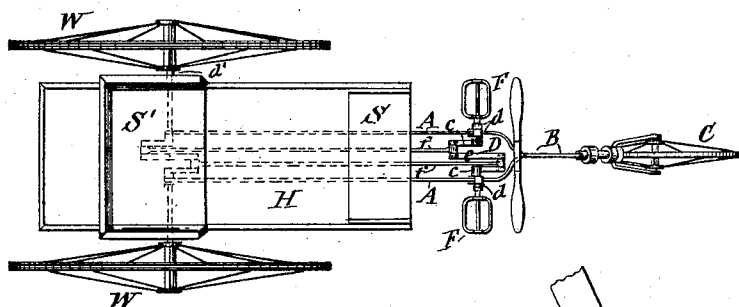
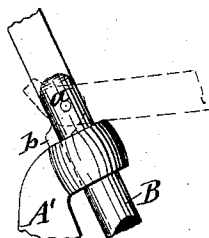
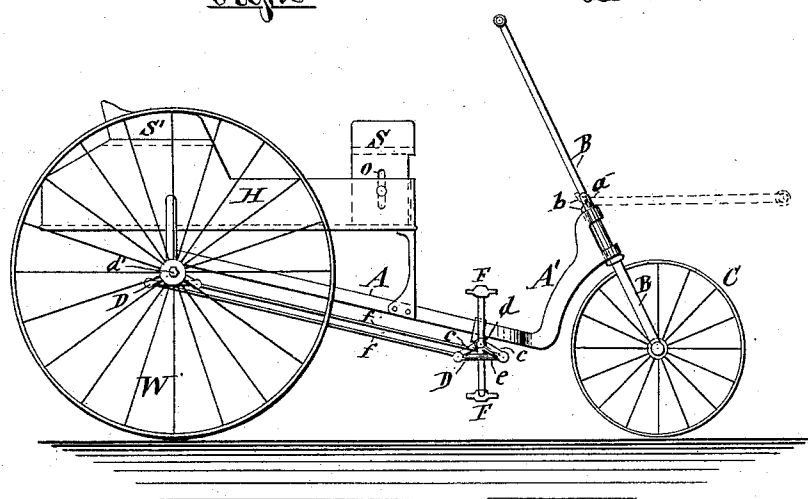


Fig. 3.



Ex. 2



Witnesses.

Ch. Bendixon

A. F. Wabz.

Inventor:

Henry La Casse

per Health, Laasethy  
his Atty -

(No Model.)

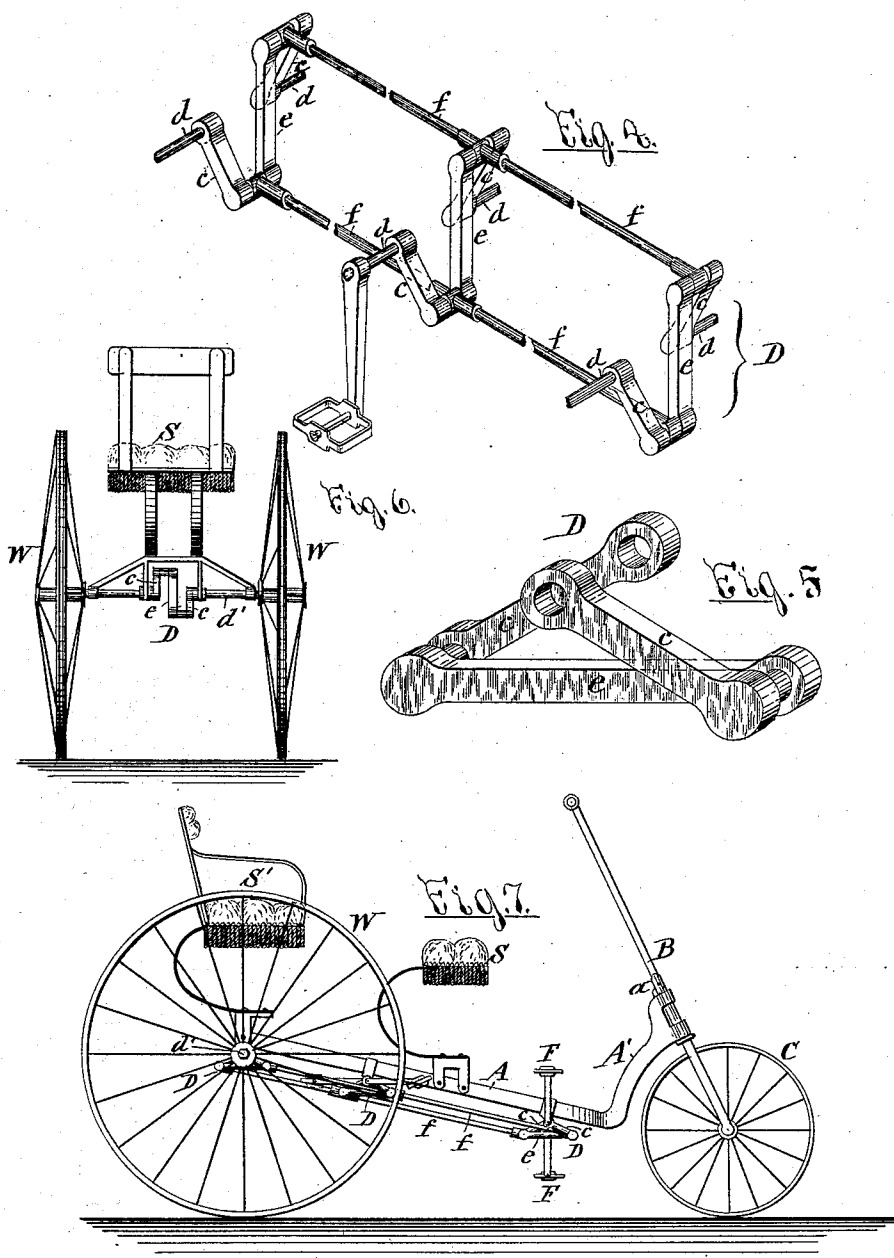
3 Sheets—Sheet 2.

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Witnesses

C. Bendixson

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Inventor.

Henry La Casse  
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(No Model.)

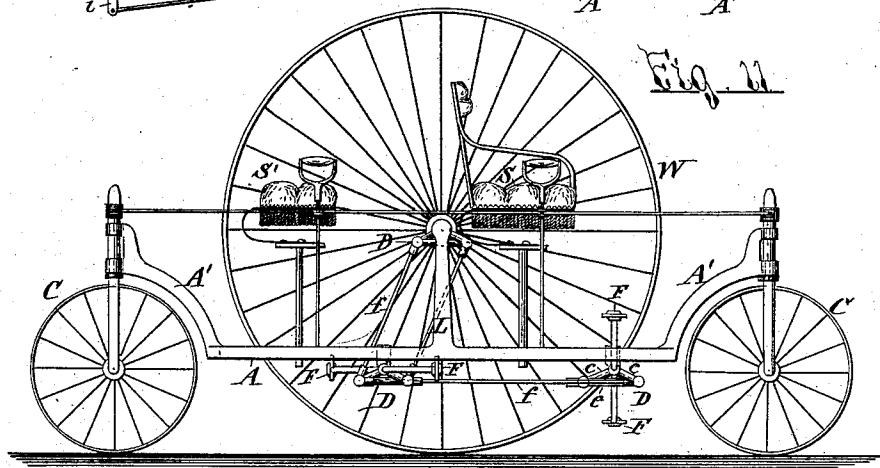
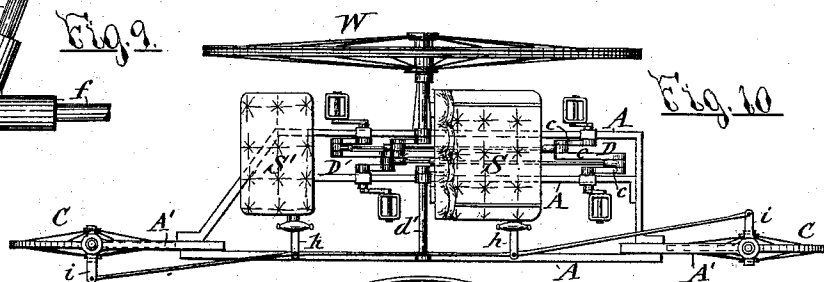
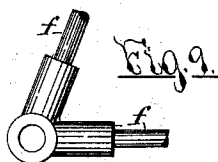
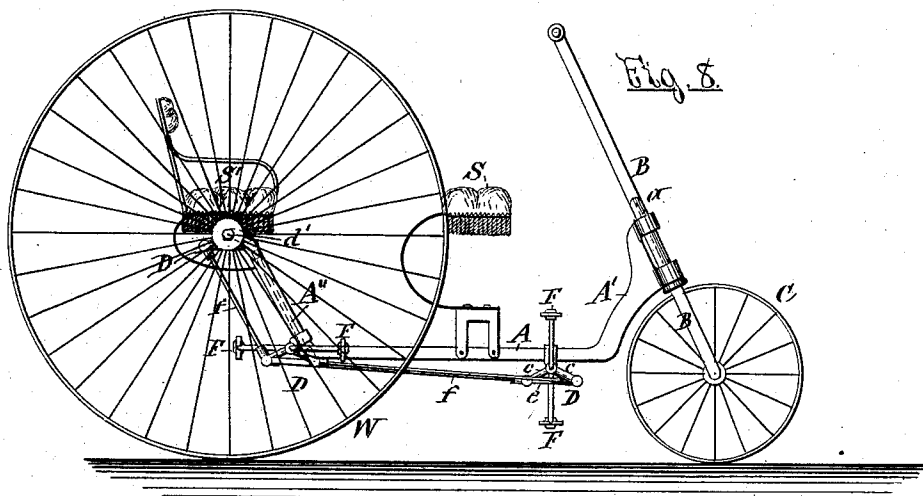
3 Sheets—Sheet 3.

H. LA CASSE.

TRICYCLE.

No. 389,517.

Patented Sept. 11, 1888.



Witnesses.

W. B. Burdison

A. F. Walz

Inventor.

Henry La Casse  
per Wm. La Cass & Wm  
his Atty

# UNITED STATES PATENT OFFICE.

HENRY LA CASSE, OF AUBURN, ASSIGNOR OF ONE-HALF TO FREDERICK  
H. GIBBS, OF SYRACUSE, NEW YORK.

## TRICYCLE.

SPECIFICATION forming part of Letters Patent No. 389,517, dated September 11, 1888.

Application filed June 14, 1886. Serial No. 205,075. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY LA CASSE, of Auburn, in the county of Cayuga, in the State of New York, have invented new and useful Improvements in Tricycles, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention consists, first, in a novel construction of a crank which is without a dead-center; secondly, in a novel application of such cranks to a velocipede or analogous vehicle for transmitting motion thereto; thirdly, in an adjustable arrangement of the seat in relation to its distance from the pedals, so as to accommodate the same to drivers of different sizes; fourthly, in mounting on the frame of the velocipede or analogous vehicle a box for transporting baggage or other articles, and supporting on said box a seat in a position to render the pedals conveniently accessible by the occupant of the seat; fifthly, in the combination, with the steering-wheel, of a steering-post which is articulated to allow it to be tilted from an upright to a horizontal position, so as to permit of manipulating it either from the seat in proximity to the steering-wheel, or from the seat on the rear portion of the vehicle or allow it to be used as a tongue, by which to draw the vehicle; and the invention furthermore consists in certain peculiarities of the detail of the vehicle, all as hereinafter more fully described, and specifically set forth in the claims.

In the accompanying drawings, Figure 1 is a plan view of a velocipede carrying a box with seats supported thereon and provided with my improved crank. Fig. 2 is a side elevation of the same. Fig. 3 is an enlarged detail view of the joint of the steering-post. Fig. 4 is a detached isometric view of a series of my improved cranks connected together. Fig. 5 is an enlarged detail view of one of the cranks. Fig. 6 is a rear end view of a tricycle embodying my invention. Fig. 7 is a side elevation of the same equipped with two seats. Fig. 8 is a side elevation of my invention embodied in another style of tricycle. Fig. 9 is an enlarged detached view of the rigid joint of two connecting-rods, by which motion is transmitted from cranks to

cranks located at different elevations on the vehicle. Fig. 10 is a plan view showing my invention embodied in a tricycle having two steering-wheels arranged tandem and to one side of the driving-wheel, and Fig. 11 is a side elevation of the same.

Similar letters of reference indicate corresponding parts.

A represents the frame of the vehicle, which frame may be of any suitable construction, according to the style of the vehicle. The forward or steering end of the frame is formed with a raised goose-neck, A', terminating with vertical journal-boxes, in which is pivoted the steering-post B, the lower end of which is bifurcated and has journaled in the bifurcation the steering-wheel C.

The steering-post I provide above the aforesaid vertical journal-boxes with a loose joint or hinge, *a*, by which the upper section of said post is connected to the lower section of the same.

The foot of the lower section is formed with a laterally-projecting heel, *b*, and by turning the steering-post in its pivot on the frame, so as to cause the aforesaid heel *b* to project rearward, the latter is caused to bear on top of the frame and thus support the steering-post in its upright position, to be manipulated by the rider of the vehicle seated near the steering-wheel. When the heel projection *b* is in the aforesaid position, the upper section of the steering-post can be tilted forward or into a horizontal position, as represented by dotted lines in Figs. 2 and 3 of the drawings, and when in said position the upper section of the steering-post can be used as a tongue for drawing the vehicle. By turning the steering post about its pivot on the frame, so as to cause the heel *b* to project forward, the upper section of the steering-post can be tilted rearward, so as to render it convenient of access for steering by the occupant of a seat on the rear portion of the frame.

D represents my improved crank, which I form of two crank-arms, *c c*, which stand at an angle in relation to each other, and are attached at one end to the adjacent ends of a divided shaft or of two axle sections or journals, *d d*, and are connected with each other at the opposite end by a diagonal arm, *e*. One of

said cranks I connect to one end of the frame A by mounting the journals  $d d$  thereof in suitable boxes or bearings on the frame, and to the extremities of said journals I rigidly attach pedal-cranks F F. Another crank D of the aforesaid construction, I connect in a similar manner to the axle  $d'$  of the driving-wheels W W, and when the frame A is of the form shown in Figs. 1 and 2 of the drawings, or in any case where the vehicle is designed to be operated by a single person, I connect the forward crank D directly with the rear crank by rods  $f f$ , connected to said cranks at the junctures of the crank-arms  $c c$  and diagonal arms  $e$ , as illustrated in Figs. 1 and 2 of the drawings.

In velocipedes or tricycles or other analogous vehicles which are designed to be operated by two or more persons, I employ one or more intermediate cranks D, journaled on the frame A between the forward crank and axle of the driving-wheels, and connect the several cranks by rods  $f f$  in the manner hereinbefore described, the intermediate cranks D being provided with pedal-cranks, which I dispose at a different angle from those of the forward crank, as represented in Fig. 7 of the drawings, thereby causing the different sets of pedal-cranks to alternately come into their most advantageous position for exerting their power. When the vehicle is equipped with more than one set of pedal-cranks, as aforesaid, I mount on the frame A a corresponding number of seats, S S', one in front of the other, or in proper positions to render the said pedal-cranks conveniently accessible by the feet of the occupants of said seats, the rods  $f f$  serving to transmit the motion to the axle of the driving-shaft.

When it is desired to maintain the frame A horizontal and as low as possible, I terminate said frame with an upward and rearwardly inclined extension,  $A'$ , at the rear end and journal the axle  $d'$  of the driving-wheels on the upper end of said extension, as illustrated in Fig. 8 of the drawings, and in this case I journal the intermediate crank D on the rear end of the horizontal portion of the frame, as shown.

Inasmuch as all the cranks are of uniform dimensions and shape, the connecting-rods are maintained parallel and at uniform angles in relation to each other during the movement of the cranks, and hence the adjacent ends of the connecting-rods may be rigidly connected, as shown in Fig. 9 of the drawings, which represents a joint of two rods transmitting motion to cranks located at different elevations on the vehicle, as represented in Fig. 11 of the drawings.

Figs. 10 and 11 of the drawings represent a tricycle which has two steering-wheels, C C, arranged tandem and pivoted to goose-necks  $A' A'$ , which project from opposite ends of the frame A on one side thereof, the driving-wheel W being arranged on the opposite side and in the center of the length of the frame A, and

the axle of said wheel being journaled on posts L, rising from the center of the frame. In this instance two cranks, D D, with pedal-cranks F F, are journaled on the frame A, one of said cranks D being located near the front end of the frame, and the other crank D being arranged back of the center of the frame; hence the junction of the horizontal transmitting-rods  $f f$  with those extending from the intermediate crank to the crank of the axle  $d'$  is at an acute angle, as represented in Fig. 9 of the drawings, the seats S S of the operators being arranged one in front and the other at the rear of the axle  $d'$ , so as to render the pedals convenient for operation by the occupants of the seats.

The steering apparatus consists of pivoted levers  $h h$  at the sides of the seats, and suitably connected with arms  $i i$ , projecting laterally from the sides of the steering-posts, on which the steering-wheels are journaled. I do not, however, limit myself to any particular form of steering apparatus.

In order to adapt the velocipede or analogous vehicle for transporting baggage or other articles, I mount on the frame A a box, H, and support on said box a seat, S, in a position to enable the occupant of said seat to operate the pedal-cranks of the crank D on the forward portion of the frame A, as illustrated in Figs. 1 and 2 of the drawings. Said seat I make adjustable in its elevation or in its distance from the pedals by providing the supporting-legs of the seat with vertical slots  $o$ , through which pass the bolts by which the seat is secured to the sides of the box. By raising or lowering said seat it can be accommodated to riders of different sizes.

If desired, one or more additional seats, S', may be placed on the box back of the operators' seats, as shown in Figs. 1 and 2 of the drawings.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the rear-seat-supporting frame provided with journal-bearings, axle journaled in said bearings, side bars extending from said frame forward and at their front ends connected rigidly to the bifurcated neck  $A'$ , provided with vertical journals, a steering-wheel secured in a bifurcated post, B, the upper end of said post being journaled in the bifurcated neck  $A'$ , a handle connected to said post for turning said steering-wheel, and adjustable actuating devices hung on the side bars for transmitting motion to the axle and driving-wheels, substantially as and for the purpose set forth.

2. In a tricycle, the combination of a driving-wheel and its axle, a main frame having a steering-wheel at the end thereof and carrying two or more seat-supports, and two or more sets of driving-pedals supported on said frame and connected by a common power-transmitting device to the driving-axle, substantially as and for the purpose specified.

3. In a tricycle, the combination of a carrying-frame, upon which are adjustably supported two or more seats, two or more sets of treadles mounted adjustably on said frame and  
5 connected to the driving-shaft by a power-transmitting device substantially of the character shown, steering-wheel held in place by a bifurcated steering-post having hinged to its upper end the steering-rod B, all constructed and operating substantially as specified.

4. In a tricycle, the combination of the bifurcated neck A', side bars connected to the arms thereof and to the axle-support, treadles carried by sliding boxes secured in place on  
15 the side bars, adjustable seat mounted on the rear frame of the tricycle, and a steering-rod hinged to the post B of the steering-wheel and adapted for use in drawing the tricycle, all constructed substantially as and for the purpose  
20 specified.

5. The combination, with the bifurcated neck A', of the side bars, A A, connected to the arms of the neck A' at one end and to the axle-supporting frame at the other end, and  
25 actuating means, substantially as described, secured to boxes hung on the side bars, substantially as and for the purpose set forth.

6. The combination, in a tricycle, of two sets of actuating devices adjustably secured to  
30 the frame between the steering-wheel and drivers and located relatively near the axle-support and the forward end of the tricycle, and adjustable seats for the riders in convenient proximity to the treadles of the actuating devices, substantially as and for the purpose set  
35 forth.

7. The combination, with the bifurcated neck A', of the side bars, A A, connected to the arms of the neck A' and to the axle-supporting frame, two or more sets of independently-adjustable treadles mounted on the side bars, and means for transmitting motion from said treadles to the axle, substantially as and for the purpose set forth.

8. The combination, with the bifurcated neck A', of the side bars, A A, connected to the neck A' and to the axle-supporting frame, two or more sets of independently-adjustable treadles mounted on the side bars, means for  
45 transmitting motion from said treadles to the axle, and adjustable seats for the riders in convenient proximity to the treadles, substantially as and for the purpose set forth.

9. In a tricycle, the combination of driving-wheels and steering-wheel connected together by means of side bars carrying adjustable actuating means and connected at the forward end to the forwardly and upwardly curved bifurcated goose-neck A', substantially as and  
50 for the purpose set forth.

10. In a tricycle, the combination of an axle, d', carrying propelling devices, driving-wheels W W on said axle, and a steering-wheel connected to the supporting-frame of the axle  
5 by means of side bars connected at one end to the rear-axle-supporting frame of the tricycle, and secured at the opposite end to a bifurcated

goose-neck supported on the post of the steering-wheel, and provided with vertical bearings within which said post is held, so as to  
70 permit the same to be turned, with adjustable treadles mounted on said side bars and connected to the propelling devices on the axle for propelling the tricycle.

11. The combination of the axle-supporting  
75 frame, axle journaled in said frame, side bars, A A, extending from said frame forward and at their front ends connected rigidly to the sides of the curved neck A', provided with vertical journals, a steering-wheel secured in  
80 a bifurcated post the upper end of which is journaled in said curved neck A', a handle connected to said post for turning said steering-wheel, and actuating devices hung on said side bars transmitting motion to the axle and  
85 driving-wheels, substantially as and for the purpose set forth.

12. In a tricycle, the combination of a driving-wheel and its axle, a main frame terminating in a curved neck, A', a steering-wheel at the end thereof, the post of which is  
90 journaled in the neck A', two or more seat-supports mounted on the frame A A, and two or more sets of driving-pedals supported on said frame and connected by a common power-  
95 transmitting device to the driving-axle, substantially as and for the purpose specified.

13. In a tricycle, the combination of a carrying-frame upon which are adjustably supported two or more seats, two or more sets of  
100 treadles mounted on said frame in boxes sliding thereon and connected to the driving-shaft by a power-transmitting device of the character shown, steering-wheel held in place by a bifurcated steering-post journaled in bearings in the neck A', and having hinged to its upper end the steering-rod, all constructed and operating substantially as specified.

14. In a tricycle, the combination of a curved neck supported on the steering-post by journals in said neck, side bars connected to the sides of said curved neck and to the axle-support, treadles carried by adjustable boxes secured in place on the side bars, adjustable seat  
110 mounted on the tricycle, and a steering-rod hinged to the post of the steering-wheel and adapted for use in drawing the tricycle, all constructed substantially as and for the purpose specified.

15. The combination of the curved neck  
120 A', having vertical journals formed therein for the post of the steering-wheel, side bars connected to said curved neck at one end and at the other end secured to the rear truss-frame in which the driving-axle is journaled, and  
125 actuating means, substantially as described, adjustably secured to the side bars, substantially as and for the purpose set forth.

16. The combination, in a tricycle, of two sets of adjustable actuating devices secured to  
130 the side bars of the frame between the steering-wheel and drivers and located relatively near the axle-support and the forward end of the tricycle, and adjustable seats for the riders in

convenient proximity to the treadles of the actuating devices, substantially as and for the purpose set forth.

17. The combination of a curved neck, A', provided with vertical journals for the steering-post, the side bars, A A, connected to said neck A' and to the axle-support, two or more sets of independently-adjustable treadles mounted on the side bars, and means for transmitting motion from said treadles to the axle, substantially as and for the purpose set forth.

18. The combination of the curved neck A', provided with vertical journals, the side bars, A A, connected to the neck A' and to the axle-support, two or more sets of independently-adjustable treadles mounted on the side bars, means for transmitting motion from said treadles to the axle, and adjustable seats for the riders in convenient proximity to the treadles, substantially as and for the purpose set forth.

19. In a tricycle, the combination of an axle, d', carrying propelling devices, driving-wheels on said axle, and a steering-wheel connected to the same by means of side bars connected at one end to the rear truss frame of the tricycle and converging at the opposite end to a curved neck, A', supported on the post of the steering-wheel, said neck being provided with vertical bearings within which said post is held, so as to permit the same to be turned for steering the tricycle, with adjustable treadles mounted on said side bars and connected to the propelling devices on the axle for propelling the tricycle.

20. In a tricycle, the curved neck provided with vertical journals in which is held the steering-post B, in combination with a hinged extension of said steering-post, projecting above said neck A', and provided with the laterally-projecting heel b, bearing on the upper face of the neck A' to steady the steering-wheel, all constructed and operating substantially as and for the purpose specified.

21. In a tricycle, the curved neck A', provided with vertical journals, the side bars connected to the neck A' at one end and to the axle-support at the other end, actuating means, substantially as described, secured to the side bars, a steering-rod hinged to the post of the steering-wheel and provided with the laterally-projecting heel b, bearing against the upper face of the neck A' to steady the steering-wheel, all constructed and operating substantially as set forth and shown.

22. In a tricycle, the combination of driving-wheels W and a steering-wheel, C, connected together by means of side bars secured to the rear truss-frame at one end and at the opposite end rigidly secured one at each side of a curved neck provided with vertical journals in which the post of the steering-wheel is held,

actuating means held in place on said side bars by boxes sliding on the same, seats in convenient proximity to the treadles, and a steering-rod connected to the steering-post for controlling the steering-wheel, all constructed and operating substantially as and for the purpose set forth.

23. In a tricycle, driving-wheels hung on an axle which is journaled in a rear truss-frame having bearings for the same, steering-wheel hung in a bifurcated post held in place by vertical journals in a curved neck, A', the lower curved arm of said neck being connected to side bars, the front ends of which are rigidly secured to said curved neck and the rear ends of which are secured to the rear truss frame, boxes sliding on the side bars carrying treadles journaled in said boxes, seat for the driver carried above the treadles, and actuating means connecting the treadles and axle for propelling the machine, substantially as shown.

24. In a tricycle, the combination of driving-wheels and steering-wheel connected together by means of side bars secured at their rear ends to the rear truss-frame at each side of the actuating means on the axle, said side bars extending thence forward and at their front ends converging to the arm of a curved neck, A', to which they are rigidly connected, adjustable treadles carried by boxes mounted on the side bars, curved neck A', provided with vertical journals supported on the bifurcated post by which the steering-wheel is held, seat in convenient proximity to the treadles, and a rod connected to the steering-wheel post for guiding the same, all constructed and operating substantially as specified.

25. In a tricycle, the combination of driving-wheels and steering-wheel connected together by means of side bars secured at their rear ends to the rear truss-frame at each side of the center of the axle, said side bars extending thence forward and at their front ends converging to the arm of a curved neck, A', to which they are rigidly connected, adjustable treadles carried by boxes mounted on the side bars, curved neck A', provided with vertical journals supported on the bifurcated post by which the steering-wheel is held, seat in convenient proximity to the treadles, and a rod connected to the steering-wheel post for guiding the same, all constructed and operating substantially as specified.

In testimony whereof I have hereunto signed my name and affixed my seal, in the presence of two attesting witnesses, at Syracuse, in the county of Onondaga, in the State of New York, this 12th day of June, 1886.

HENRY LA CASSE. [L. S.]

Witnesses:

IRVING A. WESTON,  
C. H. DUELL.