

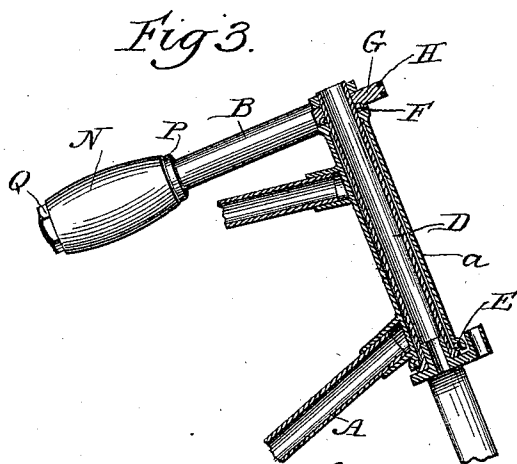
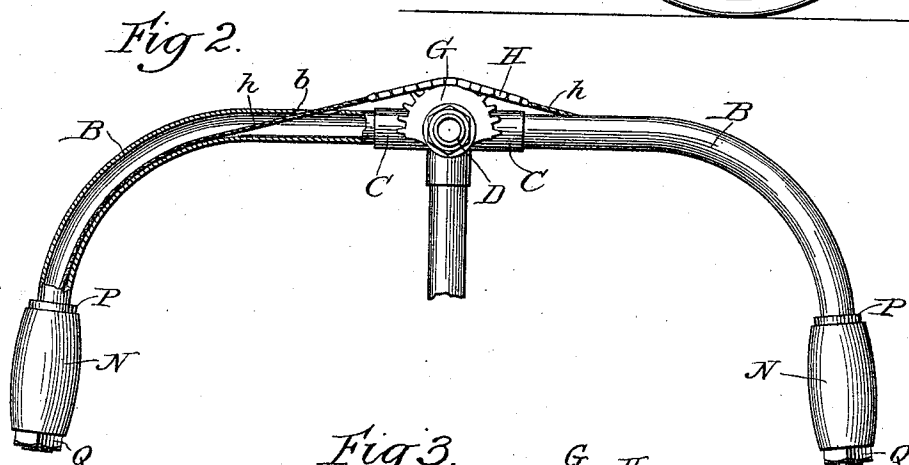
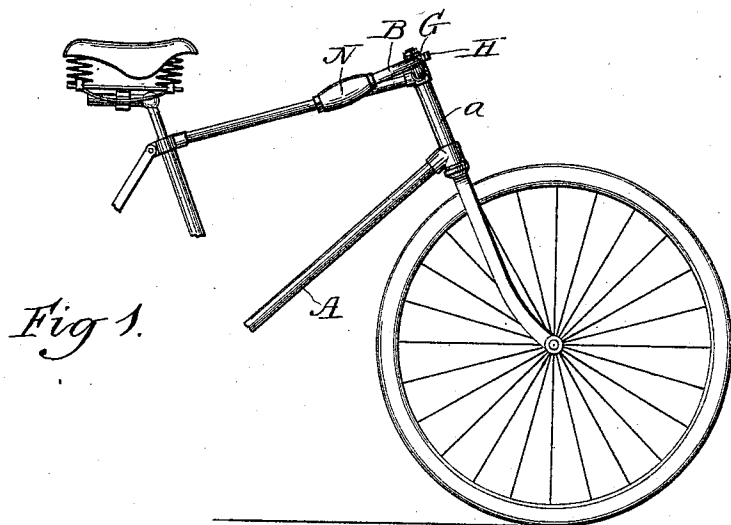
(No Model.)

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VELOCIPED.

2 Sheets—Sheet 1.

No. 496,388.

Patented May 2, 1893.



Witnesses  
Wm. J. Henning  
Wm. M. Rheem.

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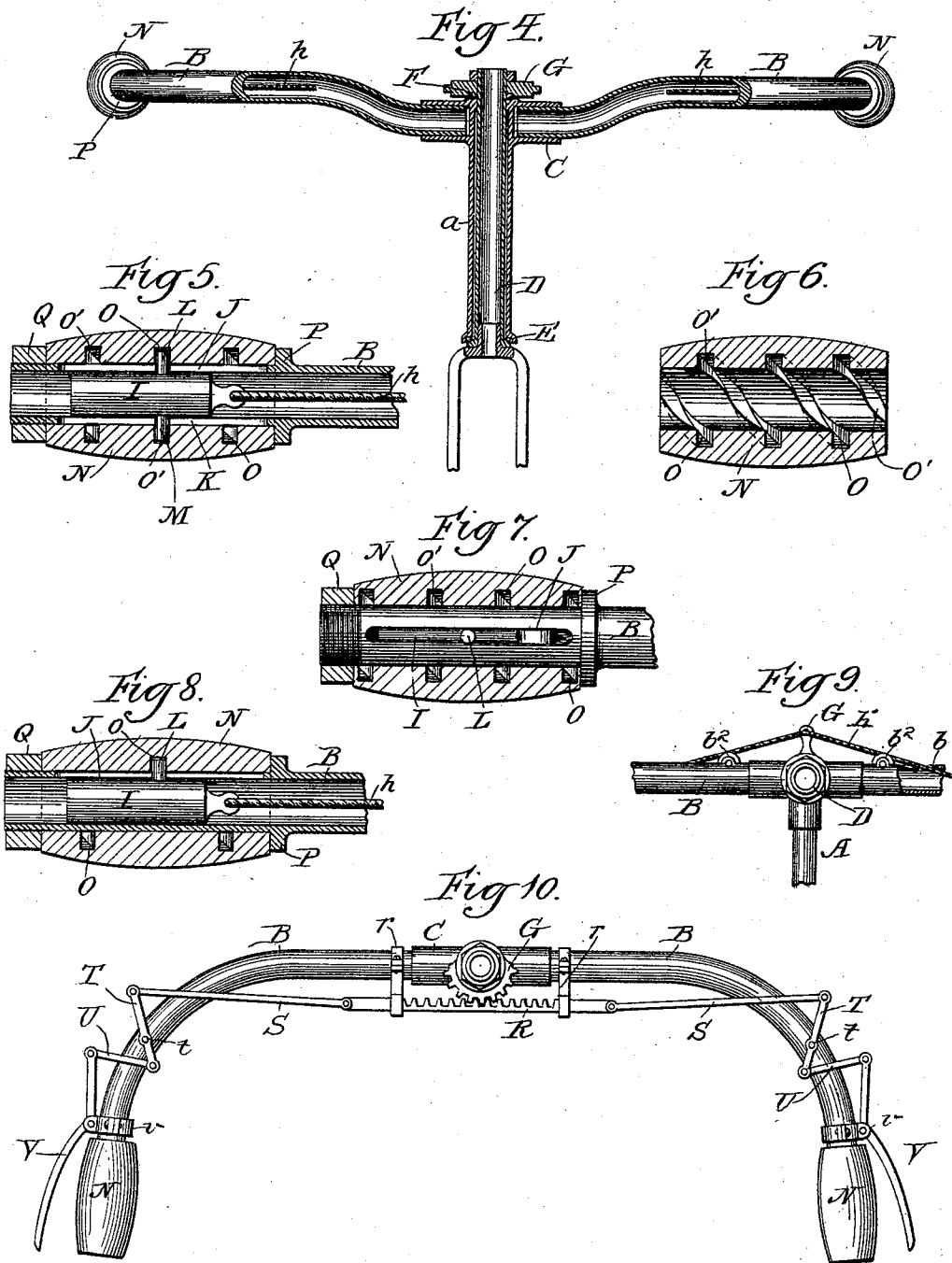
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# UNITED STATES PATENT OFFICE.

JAMES W. ADAMS, OF CHICAGO, ILLINOIS.

## VELOCIPEDE.

SPECIFICATION forming part of Letters Patent No. 496,388, dated May 2, 1893.

Application filed June 30, 1892. Serial No. 438,519. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES W. ADAMS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Velocipedes, of which the following is a full, clear, and exact specification.

My invention relates to improvements in velocipedes generally, but more particularly to bicycles, and it is more especially designed to improve the steering mechanism and increase the stability of the machine.

A fault of the bicycle, especially of that class known as the "safety," too well known to those familiar with the art to require elaborate explanation, is that the motion of the body of the rider, resulting from his efforts to preserve his equilibrium and brace himself by means of the handle or steering bar while applying the requisite propelling force to the pedals, renders the steering wheel unstable, deflecting it alternately to the right and left, and producing the wobbling or irregular travel of the machine. This fault is of course the direct result of employing the steering bar as a hand hold or brace while propelling the machine.

The primary object of my invention, therefore, is to provide improved means which will enable the rider to control the steering wheel of the velocipede without moving the handle bar.

A further object of my invention is to provide improved means which will enable the rider to steer the machine without moving the handle bar, and without removing his hands therefrom.

Another object of my invention is to provide the machine with a handle bar rigid with the frame of the machine, and having improved means thereon for controlling the steering wheel.

My invention consists of certain features of novelty in the construction, combination and arrangement of parts by which the said objects and certain other objects hereinafter explained are accomplished, as fully explained with reference to the accompanying drawings, and more particularly pointed out in the claims.

In the said drawings, Figure 1 is a side elevation of a portion of a bicycle provided with

my improvements. Fig. 2 is a plan view, partly in section, of the handle bar and head of the machine, on a larger scale. Fig. 3 is a vertical side section of the head of the machine. Fig. 4 is a vertical front section taken on a plane passing through the head of the machine. Fig. 5 is an enlarged detail sectional view of one of the handles and a portion of the handle bar. Fig. 6 is a detail sectional view of one of the handles detached. Fig. 7 is a detail sectional view similar to Fig. 5, but the section being taken at right angles to the section in the latter figure, and the handle bar being shown in elevation. Fig. 8 is a view similar to Fig. 5, but of a modification hereinafter explained. Fig. 9 is a detail plan view of a modified form of lever for deflecting the steering wheel, hereinafter explained; and Fig. 10 is a view similar to Fig. 2, but of a modified form of actuating mechanism.

Like signs of reference indicate like parts throughout the several views.

The features embodying my invention will be herein shown and described in connection with the ordinary "safety" bicycle, but it will of course be understood that such is but an example of the many forms which are susceptible of my improvements.

In carrying out my invention, I provide some fixed or rigid portion of the velocipede or bicycle frame A, preferably the head *a*, in which the steering stem is arranged with a rigid handle bar, B, which may be of the ordinary tubular form, and secured in any suitable manner to or formed on the upper end of such head *a*, at right angles to the said head and stem and also at right angles to the plane of movement of the driving wheel. As a convenient manner of securing the head and bar together, the head may be provided at or near its upper end with jetting hubs or sleeves C, into which the two portions of the handle bar are respectively secured, thus making such bar rigid with the frame of the machine.

The stem, D, of the steering wheel forks may pass through the head *a*, and be provided therein with suitable anti-friction bearings, such as the ball bearings, E, F, as usual. This construction leaves the steering wheel and its stem, D, to turn independently of the handle bar, and now in order that the move-

ments of the steering wheel may be under the control of the rider, I secure to the stem, D, at some suitable point, the lever G, which is provided with a connection extending to the outer or rear ends of the handle bar, within convenient reach, whereby the rider may impart the desired degree of rotation to the steering stem, D, for deflecting the steering wheel. As shown in Figs. 1 to 4, and 10, this lever G consists of a toothed segment lever, or the segment of a sprocket wheel, which is keyed or otherwise secured to the upper end of the stem D, preferably just above the head, *a*. The lower side of such segment lever, if desired, may serve as the upper bearing for the balls of the bearing F, while the lower bearing of such balls may be formed in the head *a*.

As shown in Fig. 2, the connection above referred to, between the lever G and the ends of the handle bar, consists of a short length of sprocket chain, H, which engages with the teeth of such segment lever, G, and is preferably of sufficient length only to turn the segment through an arc of forty-five degrees in either direction, this being a sufficient deflection of the steering wheel for all practical purposes, but of course any greater length of chain may be employed for giving a greater degree of deflection, if desired. It is desirable, however, that a short length of chain be used, since it is also desirable that for the sake of neatness and simplicity the connection, of which the chain, H, is a part, should after passing around the lever G, enter the handle bar through openings *b*, on both sides, and pass therealong; and in order to do this, it is desirable that the portions which enter the handle bar should consist of thin wires or cables, *h*, for it will be understood that such cables will create less friction against the handle bar, and will necessitate less opening (*b*) for their passage into the handle bar. I mention these features, however, as desirable, rather than essential to the fundamental principle of my invention.

In order that the outer ends of the handle bar may be brought up to the level of the lever G, in the plane of movement thereof I preferably bend such ends of the bar slightly upward, as more clearly shown in Fig. 4, thus avoiding undue deflection of the connection *h*.

The rear ends of the cables *h*, are respectively secured in any suitable manner to the longitudinally reciprocating lugs or blocks I, located in each end of the hollow handle bar B, as shown more clearly in Fig. 5. At this point the handle bar is provided at each end with two longitudinal slots J, K, which constitute guides for the lugs I, while serving for the passage of pins, L, M, that are secured to or formed on the lugs I, and protrude a short distance through said slots, thus permitting the lugs I to be reciprocated or moved longitudinally only.

The handles N, which may be of the usual or of any suitable form, are located upon the

ends of the handle bar, over the slotted portions thereof, and are provided with internal screw threads or spiral grooves, O, into which the protruding ends of the pins L, M, project. The handles are of course rotatable on the handle bar, and may be held against longitudinal movement thereon in any suitable manner, as by means of the shoulders or flanges P, and the removable nuts or taps, Q. Thus it will be seen that by turning or twisting the right or left handle, according to the direction in which it is desired to steer, the pins L, M, will be caused by the spiral groove to slide along the slots J, K, and pull the lugs I and cables *h* with them, and consequently deflect the steering wheel through the intermediary of the chain H and lever G. It is desirable to employ two of the pins L, M, on each of the lugs I, on opposite sides, so as to avoid the possibility of the binding of such lug within the handle bar, and since the length of the ordinary handle is such as to require that the pins be placed substantially diametrically opposite each other, as otherwise their movement would be prematurely arrested by coming against the shoulder P, or nut Q, it becomes necessary to employ a double spiral groove in each handle, as shown in Figs. 5, 6 and 7. The pin L projects into the groove O, while the pin M projects into the other one, O', the two grooves of course being of the same pitch and parallel, as will be understood. This double screw, however, is not absolutely essential, as the handle might be constructed with one groove or screw only, as shown in Fig. 8, the lug I in that event being provided with a single pin; and it will also be understood that two pins might be employed even with a single groove or screw, should it be deemed expedient to make the handle of such a length as to leave sufficient play at each end of the groove for the pins to move back and forth the requisite distance to effect the desired degree of deflection of the steering wheel. The pitch of the screw should be such that about a one-half revolution of the handle will cause the steering wheel to be deflected about forty-five degrees, and at the same time it should not be so great as to render it difficult of manipulation; and on the other hand it should not be so slight as to render it difficult to deflect the steering wheel by means of one handle only, that is, it is desirable that it should be so constructed that the rider could steer to the right by turning or twisting the right hand handle to the right, without applying any power to the left hand handle, and vice versa. Thus it will be seen that the application of my improvements to a machine does not materially affect the flexibility of the steering wheel, but leaves such wheel free to be deflected from side to side by the manipulation of either as well as both of the handles, and when neither handle is gripped by the rider the steering wheel is practically as free as that of the ordinary machine. I have found that with a lever, G, of about

one and one-half inches in length or radius, it will require a throw of about one and one-eighth inches to deflect the steering wheel forty-five degrees, and to effect this length of throw of the lever G by a half turn of the handle, the spiral groove will of course require a pitch of about one and one-eighth inches to a half turn; but I do not wish to be understood as binding myself to these proportions, as the same may be readily varied, and differently calculated by the ordinary mechanic. A segment lever, such as the described lever, G, is the preferable form of lever, as it always presents the same length of leverage to the connection H, *h*, and does not cause the cables *h*, to vibrate in their passages, *b*, but such form of lever is not absolutely essential, and if desired a plain lever such as the form shown in Fig. 9 may be employed. With such plain lever, the sprocket chain H would of course be unnecessary and a single cable, H', connected to the lever might be employed, the handle bar, if desired, being provided near each of the openings, *b*, for the passage of the cable H', with anti-friction rollers, *b*<sup>3</sup>, to relieve the cable of undue friction against the handle bar.

In the form shown in Fig. 10, instead of a flexible sprocket chain, and cables for operating the lever G, as above explained, I employ a rack bar R, which engages the teeth of the lever G, and may be mounted upon the handle bar or frame of the machine, by loops or brackets *r*, clamped on the handle bar. The ends of this bar R, are pivoted to connecting rods, S, which in turn are connected to short levers T, pivoted at *t*, to the handle bar, and the ends of these levers T are in turn connected by short links, U, to the shorter arms of hand levers V, which may be clamped to the handle bar by means of collars *v*, and arranged in any position which will be convenient to the hands of the rider, so that both the handle, N, and the lever V may be grasped in one hand for shifting the rack bar R to one side or the other, and effecting the deflection of the steering wheel.

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

1. In a velocipede, the combination of the head *a*, a steering wheel, having a steering stem arranged in said head, a lever secured to said stem a handle bar rigidly secured to the top of said head at right angles to said stem and to the plane of movement of the driving wheel, handles on said handle bar and steering mechanism connected to said lever and supported on said handle bar and being accessible to the hand of the rider at each of said handles, substantially as set forth.

2. In a velocipede, a rigid frame having the head *a* a steering wheel having a steering stem arranged in said head and a hollow handle bar rigidly secured to the top of said head at right angles to the said head and stem and

to the plane of movement of the driving wheel, in combination with movable handles on said handle bar, and a steering connection running through said handle bar between said steering stem and handles, substantially as set forth.

3. In a velocipede, the combination with the head *a*, and the steering wheel having a steering stem arranged in said head of a handle bar rigidly secured to the top of said head and at right angles to said head and stem and to the plane of movement of the driving wheel, a steering mechanism supported on and extending lengthwise of said handle bar and being connected to the handles thereof, substantially as set forth.

4. In a velocipede, the combination of the frame having a rigid head *a*, the steering wheel, having a steering stem arranged in said head a lever for deflecting said wheel, secured to said stem a handle bar rigidly secured to the top of said head at right angles to said head and stem and to the plane of movement of the driving wheel, rotatable handles on said bar and a connection for oscillating said lever, having screw connection with said handles, substantially as set forth.

5. In a velocipede, the combination of the frame, a steering wheel, a lever for deflecting said wheel, a hollow horizontal handle bar rigidly secured to said frame substantially in the plane of movement of said lever, rotatable handles on said bar having spiral grooves therein, lugs engaging in said grooves and attachments between said lugs and lever, passing through said handle bar, substantially as set forth.

6. In a velocipede, the combination of the steering wheel, a lever for controlling said wheel, the frame having a hollow handle bar provided with openings and being rigidly secured thereto at right angles to the plane of movement of the driving wheel and substantially in the plane of movement of said lever, rotatable handles on said bar and flexible connections extending from said lever through said openings into and along said handle bar and being connected to and operated by said handles, substantially as set forth.

7. In a velocipede, the combination of the frame the steering wheel, a lever for deflecting said wheel, an independent hollow handle bar rigidly secured to said frame transversely thereof having a slot or guide therein, a lug connected with said lever arranged in each end of said handle bar and having a pin projecting through said slot or guide, and screws mounted on said handle bar and engaging said pins, substantially as set forth.

8. In a velocipede, the combination of the steering wheel, a lever for deflecting said wheel, an independent handle bar having slots or guides formed in the ends thereof, rotatable handles mounted on said handle bar and each having a spiral groove formed in its interior, lugs arranged within said handles and

having pins engaging in said spiral grooves, and a connection between said lugs and lever, substantially as set forth.

9. In a velocipede, the combination of a steering wheel, a lever for deflecting said wheel, an independent handle bar having two slots or guides formed in each end thereof, rotatable handles mounted on said handle bar and having double spiral grooves formed in their interiors, lugs arranged within said handles and each having two pins engaging in said spiral grooves, and a connection extending from said lugs through said handle bar to the said lever, substantially as set forth.

10. In a velocipede, the combination of a frame having a head, a handle bar rigidly secured to said head, a steering stem journaled in said head, a lever secured to said stem above said bar, but on a level with the ends of the latter and means for oscillating said lever independently of said bar, substantially as set forth.

11. In a velocipede, the combination of the

frame having a head, a hollow handle bar rigidly secured to said head and having its ends bent upwardly, a steering stem journaled in said head, a lever secured to said stem above said bar but on a level with the ends of the latter, screws on said bar and an attachment connected between said lever and screws, passing through said bar, substantially as set forth.

12. In a velocipede, the combination with the frame of a rigid hollow handle bar secured thereto, the steering stem journaled in said frame, a lever on said stem, rotatable handles on said bar having spiral grooves therein, lugs arranged in said bar adapted to be reciprocated by said spiral grooves and having connection with said lever and the shoulders P and taps Q for restricting the movement of said handles, substantially as set forth.

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