(No Model.)

# W. F. CORNELIUS.

## BICYCLE.

No. 455,864. Patented July 14, 1891.

Fig. 1.

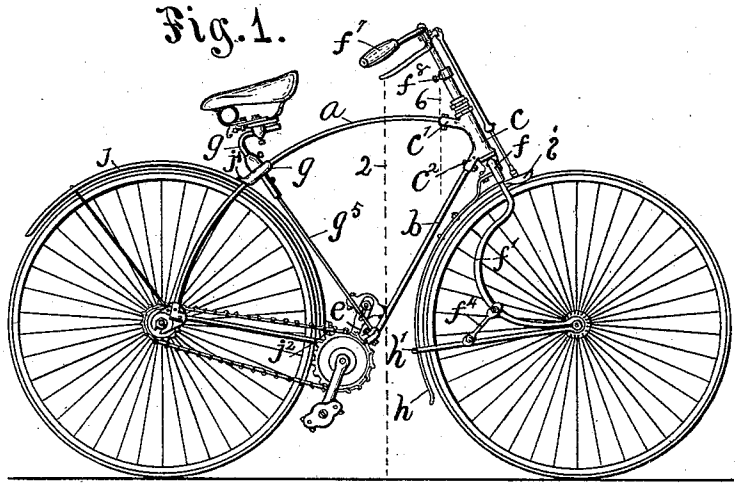


Fig. 2.

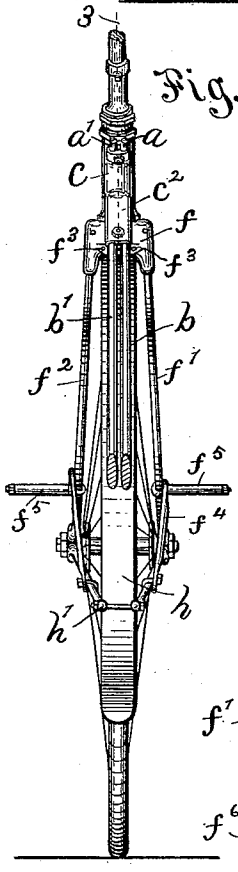


Fig. 5.

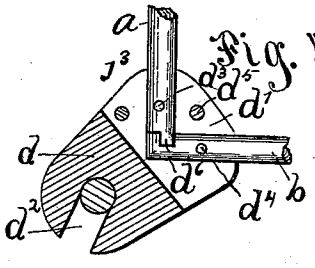


Fig. 3.

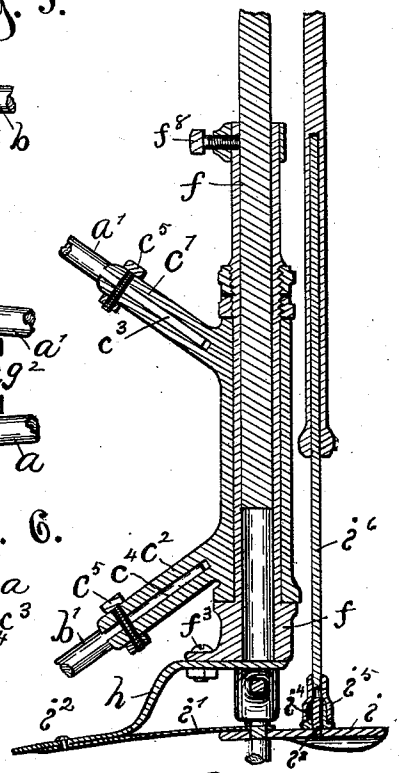


Fig. 4.

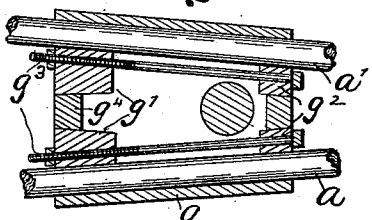


Fig. 7.

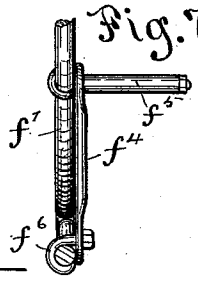


Fig. 6.



Witnesses:

Jos. W. Teeter

G. B. Leeds

Inventor.

Wilbur F. Cornelius

By Abe. L. Teeter

Atty.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

# UNITED STATES PATENT OFFICE.

WILBUR F. CORNELIUS, OF INDIANAPOLIS, INDIANA.

## BICYCLE.

SPECIFICATION forming part of Letters Patent No. 455,864, dated July 14, 1891.

Application filed October 10, 1890. Renewed May 20, 1891. Serial No. 393,489. (No model.)

*To all whom it may concern:*

Be it known that I, WILBUR F. CORNELIUS, of Indianapolis, in Marion county, and State of Indiana, have invented certain new and useful Improvements in Bicycles; and I hereby declare the following to be a full, clear, and exact description of the invention, which will enable others skilled in the manufacture and application of inventions of its class to make and use the same.

The objects of my invention are, first, to produce a machine that shall be more elastic by making certain parts of the frame of spring-steel instead of inflexible tubing, as ordinarily used; second, the production of a machine that shall be sufficiently elastic for being constructed, as shown and described in the following specification and accompanying drawings.

Figure 1 is a side elevation of my invention. Fig. 2 is a vertical section through line 2, looking to the right. Fig. 3 is an enlarged vertical section of steering-head through line 3. Fig. 4 is an enlarged longitudinal sectional view through center of seat-clamp. Fig. 5 is an enlarged vertical sectional detail view of rear frame-clamp or axle-block. Fig. 6 is an enlarged vertical cross-sectional view on line 6. Fig. 7 is an enlarged back view of section of front fork having coaster and tension-adjusting brace attached.

$a$, $b$, $c$, and $d$ form the frame of my bicycle, $a$ and $a'$ being preferably of round rods reaching from the steering-head sleeve $c$ to axle-block $d$, which is provided at $d^2$ with a space adapted to fit over the axle-bar of rear wheel. $b$ and $b'$ are in this case also round bars reaching from the lower end of $c$ to axle-blocks $d$ and $d'$, there being necessarily one on each side. At intermediate points said bars pass through clamps $g$ and $e$, said clamps being for the double purpose of the bracing respective bars at said points and providing supports for the seat and pedal-shaft, respectively.

The strain on the bars $a$ and $b$ tends to force said bar $a$ into block $d$, while the tendency from strain on $b$ acts in a reverse direction, thus tending to draw bar $b$ away from said block $d$. Hence to secure most thoroughly, $a$ and $b$ are interlocked, as seen at $d^6$, a transverse gain being cut into the bar $b$ at the junction of $a$ and $b$ and near the end of the latter, and a tenon formed at end of bar $a$, adapted to fit into said gain. $b$ is first introduced into a closely-fitting opening in block $d$; then $a$ is inserted till it engages with $b$, as seen at $d^6$, when they are both pinned or riveted, as seen at $d^3$ and $d^4$, a bolt or screw passing through said block at $d^5$, said block being split vertically through the center of the section embraced by the angle formed by $a$ and $b$, so that the bolt or screw at $d^4$ closes the sides of $d$ at this point, thus causing the said bars to be securely bound. At the opposite end of this frame these bars are inserted into the projections $c'$ and $c^2$, fitting very closely into the holes in said projections, and said holes being slotted from one to the other, as seen at $c^3$ and $c^4$. The bolts $c^5$ are preferably of such size that they will cut slightly into the bars at their inner sides, and when drawn firmly down the upper and lower sides of said projections $c'$ and $c^2$ are compressed between the bars, the spaces $c^3$ and $c^4$ being slightly contracted by the binding force of said bolts $c^5$, thus securing the bars firmly.

$e$ is a clamp secured to the bars $b$ and $b'$ at a suitable point for the purpose of bracing the frame and also providing support for the bearings of the driving mechanism.

The seat-clamp $g$ has internally the form of a broad, flattened, or oblong tapering band, excepting that it is provided with a cross-bar $g^4$ at each end, against which certain wedges are adapted to bear, said wedges $g'$ at one end and $g^2$ at the other. These wedges are shaped so as to conform to the shape of bars $a$ and $a'$ on their outer sides, and are preferably flat on the sides bearing against cross-bars $g^4$. These wedges are adapted to operate in opposite directions, so that the bolts $g^3$, one being on each side, each pass through two wedges $g'$ and $g^2$ on respective sides. Thus it will be seen that when the nuts on bolts $g^3$ are drawn the respective two wedges $g'$ and $g^2$, with which said bolts are engaged, will be tightened, by which means said bars $a$ and $a'$ are securely braced and said clamp thoroughly secured to said bars. Said seat-clamp is also provided with an upwardly-projecting sleeve, which supports the adjustable seat-bar $g^6$, said sleeve being provided with a set-screw, whereby said seat-bar may be secured at any

desired height. Said seat-bar $g^6$ is preferably made of tubing, or is tubular, at least, in its lower end section to admit of the insertion of a brace-rod $g^5$, said brace-rod resting at lower end in gear-clamp $e$ and being held in position by a set-screw, which is at or near lower end of seat-bar $g^6$. It is necessary to use this brace only when the rider is a person of more than the average weight that the bicycle is intended ordinarily to bear. $g$ is also provided with a small projection $j'$, to which is attached the guard $j$. Said guard is also attached to a similar projection $j^2$ on gear-clamp $e$. Said guard is also supported by a brace-rod secured to it at or near its rear end and proceeding on either side to axle-blocks $d$ and $d'$ and secured thereto at $j^3$.

$f$ is the tubular steering-head, to the upper end of which is attached an adjustable handle-bar $f^7$, secured by set-screw $f^8$. Said steering-head divides at its lower end into two tubular branches, within which are secured the upper ends of spring-bars $f'$ and $f^2$, which, together with said head, constitute the "front fork," as it is usually termed, which supports the front wheel. Said spring-bars $f'$ and $f^2$ proceeding from said steering-head in a curved line, as shown, and making one turn about the axle, form an eye within which said axle is held. Then they proceed in a straight line to the rear of said wheel to a point $h'$, where they serve, in combination with a bolt passing through them, as a clamp or fastening for the lower end of a brace-spring and guard $h$, said spring $h$ being secured at its upper end to stock $f$ at $f^3$ by two bolts, so that it affords great lateral support, while at the same time it allows of sufficient action in the springs $f'$ and $f^2$.

$f^4$ is a tension-brace which may be adjusted to give any required elasticity to the springs $f'$ and $f^2$. This brace is secured to springs $f'$ and $f^2$ at lower end by eyebolts $f^6$, and at its upper end by eyebolts $f^5$, said latter bolts also serving as coasters when provided with a suitable section of tubing serving to enlarge sufficiently the section $f^5$, adapting it to be used as a foot-rest in coasting.

As a means for adjusting the tension-brace $f^4$, when it is desired to make the spring of the front fork more elastic, the eyebolts holding said brace are loosened and the brace placed in a more nearly horizontal position, and when it is desired to secure less elasticity the brace should be placed in a more nearly vertical position and secured by said bolts.

$i$ is the brake shaped so as to conform to the shape of tire of the wheel, and is secured by a flat spring $i'$ to spring $h$ at $i^2$ by a rivet. Said brake is provided with a small stud or pin $i^3$ projecting upwardly, and on this is pressed some elastic nipple $i^4$, such as soft rubber. Then over this a cup $i^5$, to which is attached an adjustable brake-rod $i^6$. The said rubber nipple, interposed as it is between the metallic parts, will always prevent rattling.

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

1. In a bicycle, the combination of a frame and a seat-clamp provided with binding-wedges adapted to bind said clamp securely to said frame, substantially as shown.

2. In a bicycle-frame, the combination embracing a steering-head provided with two projections, each having longitudinal parallel holes lying near together, a slot running from one hole to the other, frame or reach bars inserted into said holes, and bolts passing through said projections through said slots and between said bars, cutting slightly into the latter, as and for the purposes set forth.

3. In a bicycle-frame and axle-block provided with a recess to rest upon the rear axle, holes in said block placed at or nearly at right angles to each other, a slot being cut entirely through the dividing-wall betwixt said holes, a bolt passing through said wall across said slot for the purpose of compressing said slot and binding said block upon frame-bars, in combination with frame-bars joined and interlocked within said block, substantially as set forth.

4. In a bicycle-frame, the combination of upper frame-bars, a seat block or clamp encircling said bars, four wedges within said block, two bearing against each bar and adapted to be drawn longitudinally toward each other on being tightened, and a bolt passing through said wedges adapted to draw them, substantially as shown.

5. In a bicycle, a steering-wheel fork composed of a stock provided at its lower end with two lateral projections extending downwardly, a spring-bar firmly secured in each of said projections, said bars making a backwardly-circular bend, reaching forward encircling the axle, and returning to rear of wheel, where they are joined together, and a brace-spring, serving as mud-guard, secured to said stock at upper end and near lower end to junction of said spring-bars, substantially as set forth.

6. In a bicycle, a steering-wheel fork composed of a stock provided with two lateral projections extending downwardly, a spring-bar firmly secured in each of said projections, said bars making a backwardly-circular bend, then reaching forward encircling the axle, and returning in a nearly horizontal and straight line to rear of wheel, where a junction of said bars is formed, a brace-spring, serving as mud-guard, secured at upper end to said stock and near lower end to bars at said junction, and an adjustable tension-brace secured at one end to said circular bend and at other to section lying nearly in a horizontal line, substantially as set forth.

7. In a bicycle, the combination, with a wheel, a spring-fork composed of a stock, spring-bars proceeding therefrom and securely fastened thereto at upper end, making a circularly-backward turn and proceeding

then forward encircling the axle, a brace-spring and mud-guard, an adjustable tension-brace, and a foot-rest, substantially as set forth.

8. In a bicycle, a brake, a pin projecting upwardly from said brake, an elastic nipple adapted to be placed over said pin, a plunger-rod cup-shaped at its lower end adapting it to be placed over said elastic nipple, substantially as set forth.

9. In a bicycle, a brake-plate, a spring provided in or secured to said brake-plate by which it is held in position, a pin projecting upwardly from said brake-plate, a brake-plunger rod cup-shaped at its lower extremity, and an elastic nipple adapted to be intercepted betwixt said pin and said cup-shaped end of plunger-rod, substantially as set forth.

10. In a bicycle, the combination embracing a brake-plate, an upwardly-projecting pin secured to said plate, a rubber or elastic nipple adapted to be placed on said pin, and a plunger-rod terminating in an inverted cup at its lower end adapting it to be placed over said nipple, substantially as set forth.

In testimony that I claim the foregoing I set my hand hereunto this 7th day of October, 1890.

WILBUR F. CORNELIUS.

Witnesses:
GEORGE T. PORTER,
W. H. JORDAN.