

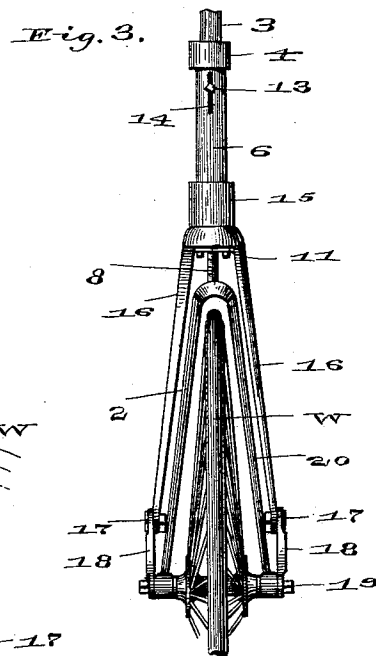
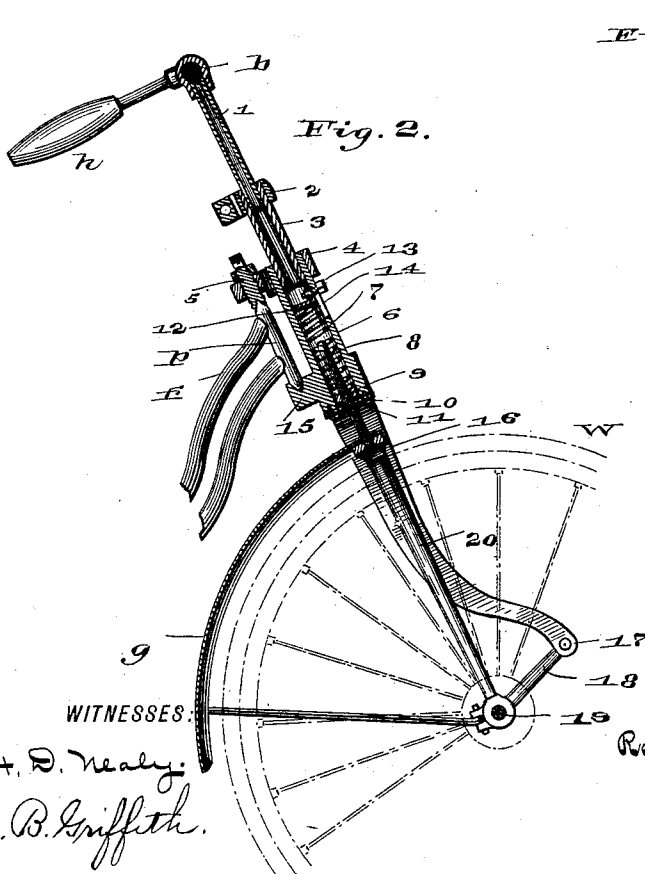
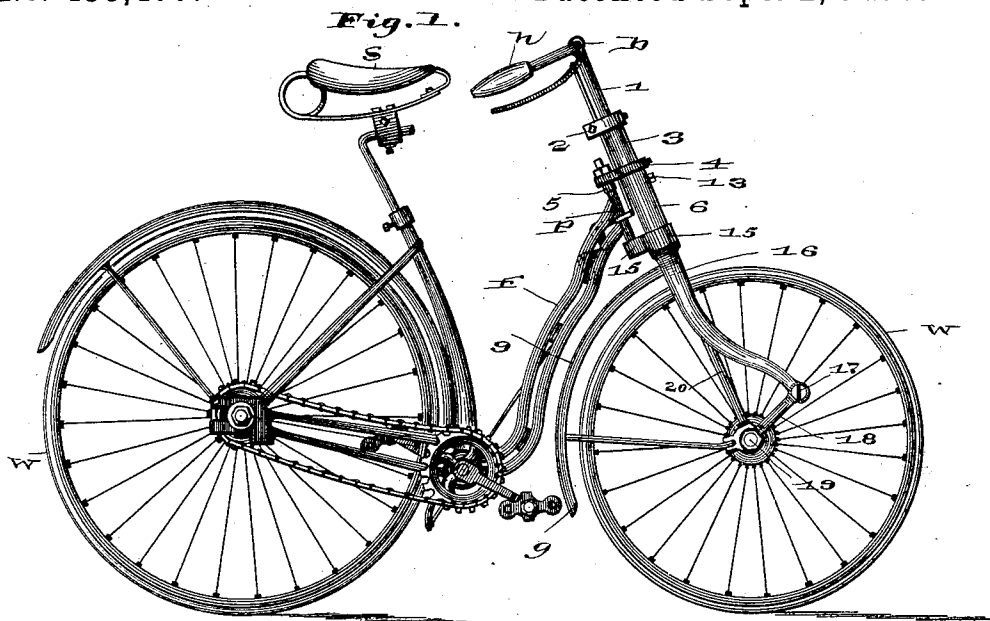
(No Model.)

2 Sheets—Sheet 1.

R. H. BLACKLEDGE.
BICYCLE.

No. 435,477.

Patented Sept. 2, 1890.



WITNESSES:
J. D. Nealy.
E. B. Griffith.

INVENTOR
Rollin H. Blackledge
BY
C. P. Jacobs.
ATTORNEY.

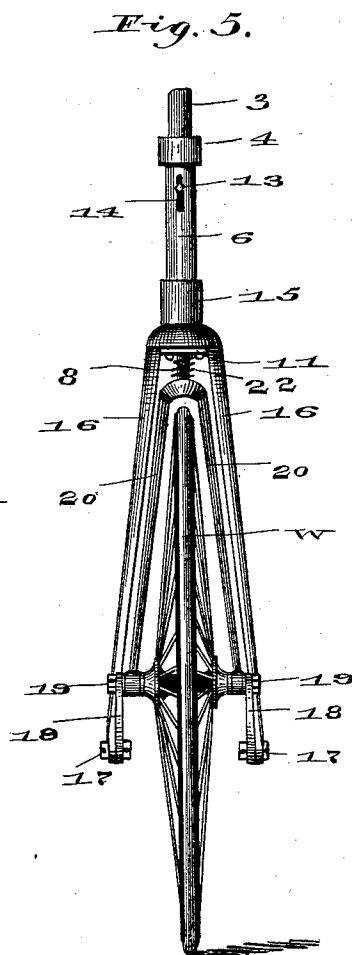
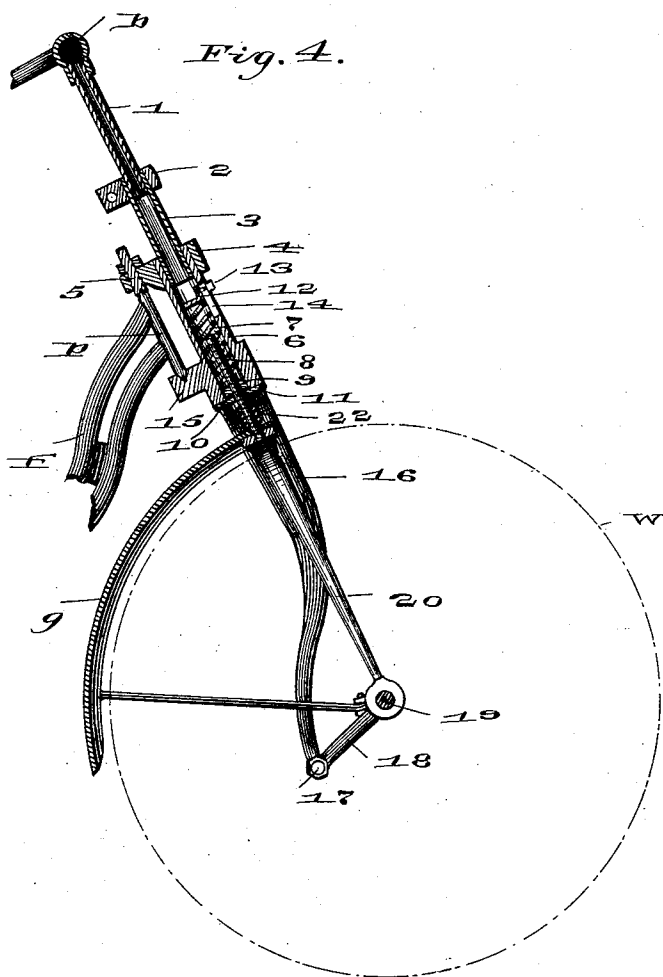
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UNITED STATES PATENT OFFICE.

ROLLIN H. BLACKLEDGE, OF INDIANAPOLIS, INDIANA, ASSIGNOR OF ONE-HALF TO HENRY T. HEARSEY, OF SAME PLACE.

BICYCLE.

SPECIFICATION forming part of Letters Patent No. 435,477, dated September 2, 1890.

Application filed June 24, 1890. Serial No. 356,583. (No model.)

To all whom it may concern:

Be it known that I, ROLLIN H. BLACKLEDGE, of Indianapolis, county of Marion, and State of Indiana, have invented certain new and useful Improvements in Bicycles; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which like letters refer to like parts.

My invention relates to the construction of bicycles, and will be understood from the following description.

In the drawings, Figure 1 is a side elevation. Fig. 2 is a vertical section through the steering-head. Fig. 3 is a front end view of Fig. 2. Fig. 4 is a vertical section through the steering-head of a modified form of my device. Fig. 5 is a front end view of Fig. 4.

My invention has for its particular object the improvement of that part of the machine which provides a spring-bearing for the front wheel, sometimes called the "spring-fork," and it will be understood that the rest of the machine, the form of the wheels, the drive-chains, the gear, and saddle are substantially of the pattern used in other machines, and these will be mentioned only in so far as is necessary to show the relation of the several parts of the machine.

In the drawings, *w* represents the wheels, *s* the saddle supported upon the usual post, and *g* are the mud-guards.

The pedals, drive-chains, and gear are shown in Fig. 1 and need not be further described.

f represents the frame, which is provided with a pivot-post *p*, which passes through the clamp 4, connected to the steering-head, its foot resting in the socket-ring 15.

h are the handles connected to the usual handle-bar *b*.

The steering-head comprises the pipe 1, which fits into the pipe 3 and is held by a clamp 2 to permit its adjustment as to height. The pipe 3 passes into the pipe 6, and connected at the top of this is the ring 4, having a projection on the rear, through which passes the pivot-pin 5, connected to the frame, its lower end resting in a socket in the projection 15 in the usual manner. Inside the pipe 6 is a coiled spring 7, which has a bearing

against the under side of the angle-plate 12, connected with which is a lock-screw 13, passing through a slot 14 in the pipe 6, whereby adjustment may be made so as to increase the pressure of the angle-plate upon the coiled spring within the limits of the slot. This spring below is coiled about the spring-rod 8, which works in a nut 9, which forms the lower backing of the spring, and beneath this nut is an elastic washer 10, and below this a plate 11, which is screwed to the under side of the main fork, which below this plate branches out into arms 16, which are pivoted at 17 to a crank 18, which is rigidly mounted on the axle 19 of the wheel, being held firmly in place by a nut. As will be seen, the spring-rod 8 passes through a hole in the plate 11, and is directly connected below to the head of the spring-fork in the manner shown in Fig. 3, and is connected on each side to the axle of the wheel between the cranks of the main fork, the arms of this fork being loosely mounted on the axle. The lower bearings, therefore, of the spring-fork are directly upon the axle on each side of the wheel and between the cranks of the main fork, while the upper end terminates in the spring-rod 8, which has a free motion within the socket of the pipe 6 and within the coils of the spring 7. It will be seen, therefore, in case of any resistance to or obstruction met by the wheel the force or blow will be transmitted directly to this spring, and the jar or concussion therefrom will be entirely relieved.

The angle of the spring-fork to the axle of the wheel is preferably set as shown in the drawings, being about thirty degrees, and the arms of the main fork are pivoted to their cranks at about the same angle (thirty degrees) to a line drawn vertically through the axis of the wheel, and this pivoting of the main fork to the cranks at 17 may be accomplished in the manner shown in either Figs. 2 or 3, wherein it is connected above a horizontal line drawn through the axis of the wheel or below such a horizontal line, as shown in Figs. 4 and 5. In either case the result is that when the wheel meets with an obstacle, whether it rides over it or meets it in front, the concussion produces a move-

ment of the cranks 18 on their pivots 17, which is transferred through the spring-fork 20 to and is carried by the spring 7, coiled in the steering-head, preventing any jolting or rocking of the machine.

My invention does not consist in inclosing a coiled spring in the steering-head to take the strain or concussion from the wheel, for I am aware that this has been heretofore done; but in such case the spring has had a bearing directly upon a piston or rod connected with the main fork, while in my invention, as will be seen, the stroke or blow is transmitted from the main fork directly to the spring-fork, which is disposed between the arms of the main fork, the latter remaining rigid at all times, thus preserving the rigidity of the wheel and relieving it from strain by means of the action of the main fork upon the auxiliary spring-fork proper, allowing the latter to move up and down with the wheel inside the arms of the main fork and without friction. Again, the adjusting device, whereby the tension of the spring may be increased, renders it possible to use the same spring for riders of different weights, its tension being accommodated to the increase and decrease of weight by means of the set-screw 13, and in case the spring becomes weak through wear the tension may be increased in the same manner. If desired, an auxiliary spring 22 (see Fig. 4) may be mounted upon the rod of the spring-fork beneath the plate 11 to take up the additional strain arising from any unusual blow or concussion of the wheel.

What I claim as my invention, and desire to secure by Letters Patent, is the following:

1. In a bicycle, a hollow steering-head and a spring coiled therein and compressed between an adjustable plate above and a nut mounted on an extension of the spring-fork below, the arms of such spring-fork loosely mounted on the axle of the wheel on either side of the hub, in combination with a main fork rigidly connected to the steering-head, the arms of such main fork pivoted outside the arms of the spring-fork to cranks rigidly connected to the wheel-axle, all combined substantially as shown and described.

2. In a bicycle, a hollow steering-head inclosing a coiled spring compressed between an adjustable plate above and a nut mounted on an extension of a spring-fork below, the arms of such spring-fork loosely mounted on the axle on either side the hub, a main fork rigidly connected to the steering-head above, and the arms thereof pivoted at an angle of about thirty degrees from a vertical line passing through the wheel-axle either above or below the horizontal axis of the wheel-hub to cranks connected to the hub, all combined substantially as shown and described.

3. A bicycle wherein the steering-head is

provided with two forks, a main fork rigidly connected thereto above and pivoted below to crank-arms rigidly connected to the wheel-axle either above or below a horizontal line passing through the center of such axle and at an angle of about thirty degrees to a vertical line passing through the center of such axle, and a spring-fork whose arms are loosely mounted on the wheel-axle inside the arms of the main fork, an extension of such spring-fork extending upward into the steering-head and adapted to compress a spring inclosed therein, whereby any concussion or blow upon the wheel will be transmitted to and carried by such elastic spring, all combined substantially as shown and described.

4. In a bicycle, a spring-fork, the arms thereof loosely mounted on the wheel-axle on either side of the wheel, such spring-fork having an extension above entering a hollow steering-head and adapted to compress a spring coiled therein, such steering-head rigidly connected to a main fork extending down and outside the spring-fork and pivoted above or below the wheel-axle to cranks rigidly connected to the wheel-axle, whereby a strain or blow or stroke on the wheel is transmitted to and carried by the elastic spring, substantially as shown and described.

5. In a bicycle, the combination of two forks mounted on the wheel-axle outside the wheel, a main fork rigidly connected to the steering-head above and pivoted to crank-rods below, which are in turn rigidly connected to the wheel-axle, and a spring-fork inclosed within such main fork, its arms loosely mounted on the wheel-axle and having an upward extension, which is adapted to compress a spring coiled in the hollow steering-head when the wheel meets with an obstacle either below or in front, substantially as shown and described.

6. In a bicycle, a hollow steering-head, a spring coiled therein and adapted to be compressed by the extension of a spring-fork whose lower ends are loosely mounted on the wheel-axle, and having an upper extension which passes into the steering-head, carrying a nut for compressing the coiled spring when the wheel meets an obstruction, in combination with a main fork rigidly connected to the steering-head above and pivoted either above or below a horizontal line drawn through the axle of the wheel to crank-arms rigidly connected to the wheel-axle on either side outside this spring-fork, all combined substantially as shown and described.

In witness whereof I have hereunto set my hand this 16th day of June, 1890.

ROLLIN H. BLACKLEDGE.

Witnesses.

E. B. GRIFFITH,

H. D. NEALY.