No. 657,667. Patented Sept. 11, 1900.

V. H. MILLS.

BICYCLE FRAME.

(Application filed Dec. 9, 1899.)

(No Model.)

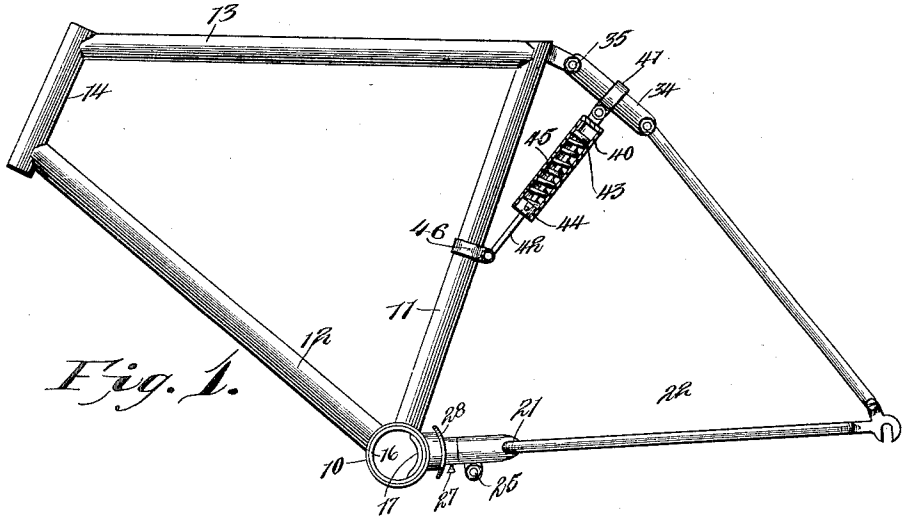


Fig. 1.

Fig. 2.

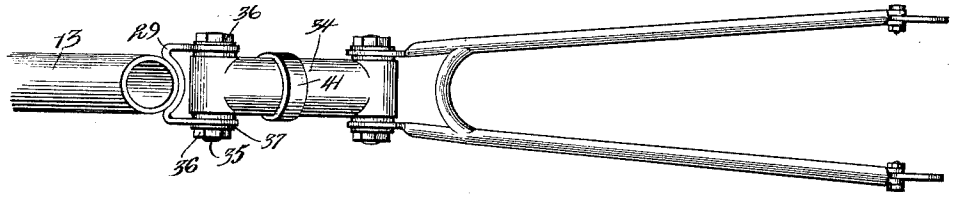


Fig. 4.

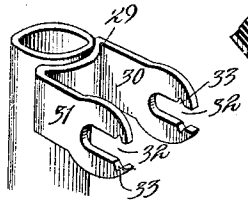


Fig. 3.

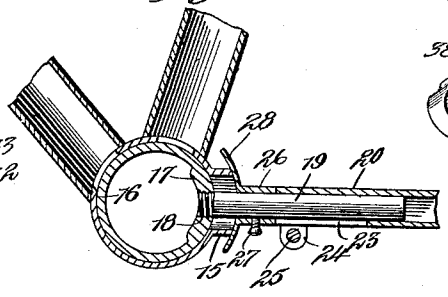
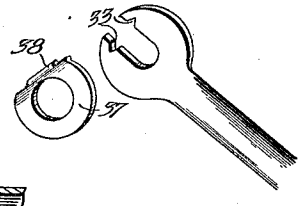


Fig. 5.



Witnesses
C. H. Walker.
Geo. H. Chandlee

Virgel H. Mills Inventor
By his Attorneys.
C. A. Snow & Co.

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

UNITED STATES PATENT OFFICE.

VIRGEL H. MILLS, OF HUBBARD CITY, TEXAS.

BICYCLE-FRAME.

SPECIFICATION forming part of Letters Patent No. 657,667, dated September 11, 1900.

Application filed December 9, 1899. Serial No. 739,836. (No model.)

To all whom it may concern:

Be it known that I, VIRGEL H. MILLS, a citizen of the United States, residing at Hubbard City, in the county of Hill and State of Texas, have invented a new and useful Bicycle-Frame, of which the following is a specification.

This invention relates to bicycles in general, and more particularly to that class known as "spring-frame" bicycles; and it has for its object to provide a construction in which the tie-rods have a hinge connection with the crank-hanger, while the rear fork is connected with the upper end of the seat-tube by means of a link, this link being held normally in a predetermined position by means of a spring, which permits it to yield under proper conditions.

In the drawings forming a portion of this specification, and in which similar numerals of reference designate like and corresponding parts in the several views, Figure 1 is a side elevation showing a bicycle-frame constructed in accordance with the present invention, the casing for the spring being in section. Fig. 2 is a plan view of Fig. 1. Fig. 3 is a section taken through the lower portions of the seat-tube and bottom bar and through the crank-hanger and the crown of the tie-rod, the core of the tie-rod crown being in elevation. Fig. 4 is a detail perspective showing the upper end of the seat-tube with the bracket thereon. Fig. 5 shows an end of one of the rear forks and a washer which coöperates with a clamping-nut to hold the fork end in position.

Referring now to the drawings, 10 represents a crank-hanger, to which are rigidly connected a seat-tube 11 and a bottom bar 12, of usual construction, and having connected therewith a top bar 13 and a head 14.

In the rear portion of the crank-hanger is formed a slot, (shown in Fig. 3,) at the edge of which is formed a rearwardly-directed flange 15. Within the crank-hanger 10 is loosely disposed a bushing 16, having a thickened portion 17, in which is formed a threaded perforation 18. Engaging the threads of the perforation is a metallic bar 19, which forms the core for the stem 20 of the crown 21, to which are secured the tie-rods 22. The stem 20 is slotted longitudinally, as shown at 23, and upon opposite sides of the slot are clamping-ears 24, having a bolt 25 passed therethrough and provided with a nut, through the medium of which the stem may be firmly clamped upon the core and may be loosened for adjustment with respect thereto.

Between the end of the stem 20 and the flange 15 is disposed a dust-cap comprising a tubular portion 26, which is held upon the core 19 by means of a set-screw 27, and at one end of which tubular portion is secured a plate 28, which is arc-shaped in cross-section and adapted to lie snugly against the similarly-shaped end or edge of the flange 15. The slot in the crank-hanger 10 is sufficiently large to permit movement of the core 19 therein, and thus the tie-rods may be raised and lowered at their rear ends independently of the crank-hanger, the plate 28 at all times covering the end of the flange 15 to prevent access of dirt thereto.

Upon the upper end of the seat-tube 11 and extending rearwardly thereof is a bracket 29, comprising a web portion which is brazed or otherwise securely fixed to the seat-tube and comprising also ears 30 and 31. The ears 30 and 31 are each provided with a slot 32, and in opposite faces of this slot are formed recesses 33. A preferably-tubular link 34 is disposed with one end between the ears 30 and 31 and is provided with a transverse perforation which is adapted to aline with the slots 32. A clamping-bolt 35 is passed through the perforation in the link and has a nut 36 screwed upon each end thereof, this bolt being adapted to be slid into and out of the slots 32, and when engaging said slots the nuts 36 may be operated to clamp the link in position. In order to more securely hold these parts in their engagement, a washer 37 is provided, and which washer has a lug 38 extending at right angles to the face thereof. A washer 37 is placed upon each end of the bolt 35 and between the nut 36 and the adjacent ear of the bracket 29. The lug 38 is of such width that it will enter the recesses 33 of the ears 30 and 31 and will thus hold the washer against slidable movement, the washer in turn holding the adjacent end of the bolt in the slots. Additional washers may be disposed between the ears 30 and 31 and the adjacent faces of the link 34.

The upper ends of the sides of the rear fork

are slotted and recessed in the same manner as the ears 30 and 31 and are adapted to receive a clamping-bolt and the lug of a washer, respectively, carried by the rear end of the link 34, which is disposed between the upper ends of the sides of the rear fork. As shown in the drawings, the rear fork and the tie-rods are pivotally connected, and from the above-described construction it will be seen that the rear ends of the tie-rods and rear fork may be raised and lowered with respect to the remainder of the bicycle-frame by displacing the link 34. The upward movement of the rear ends of the tie-rods has the effect of raising the link 34, and hence a rider supported upon the seat-tube will tend to move the seat-tube downwardly with respect to the rear end of the link. In order to hold the link yieldingly against this movement, a cylindrical casing 40 has a closed end which is connected with the link through the medium of a band 41, while from the other end of the casing there protrudes the rod 42, attached to a piston 43, disposed in the casing 40. In the lower end of the casing is secured a block 44, through which the rod 42 is passed, and between this block 44 and the piston 43 and encircling the rod 42 is a helical spring 45, the effect of this spring being to hold the link 34 yieldingly at the limit of its downward movement, when the rod 42 is fixed to the seat-tube 11 in any desired manner, such as through the medium of a strap 46, which encircles the seat-tube and between the ends of which the rod 42 is pivoted.

From the above construction it will be seen that if the frame described be provided with wheels in the usual manner the weight of a rider will have the effect of compressing the spring 45, and the spring will thus have the effect of absorbing practically all of the jarring motion incident to the riding of the bicycle, the result being an extremely comfortable and easy construction.

It will of course be understood that in practice the specific construction may be altered and that any desired materials and proportions may be used for the various parts without departing from the spirit of the invention.

Mounted upon the bolts 35 are the cones of bearings for the link 34, and which bearings comprise balls disposed in the usual manner, the entire bearing being any common form of ball-bearing.

What is claimed is—

1. In a bicycle-frame, the combination with a crank-hanger and the seat-tube connected therewith, said hanger having a slot therein, of a bushing disposed within the hanger, a rod engaging the bushing through the slot of the hanger, tie-rods connected with the rod, rear forks connected with the tie-rods, a link connected with the rear forks and with the seat-tube, and means for holding the link yieldably in a predetermined position.

2. In a bicycle-frame, the combination with a crank-hanger and the seat-tube connected therewith, said hanger having a slot therein, of a bushing within the crank-hanger and adapted for oscillation, a rod passed through the slot of the hanger and engaging the bushing, a dust-cap fixed upon the rod and adapted to close the slot of the hanger, tie-rods slidably connected with the rod, rear forks connected with the tie-rods, and a link connection between the rear forks and the seat-tube.

3. In a bicycle-frame, the combination with a crank-hanger and a seat-tube connected therewith, said hanger having a slot therein, of a bushing within the crank-hanger and adapted for oscillation, a rod passed through the slot of the hanger and engaging the bushing, a dust-cap fixed upon the rod and adapted to close the slot of the hanger, tie-rods slidably connected with the rod, rear forks connected with the tie-rods, a link pivotally connected with the rear fork and with the seat-tube, and means for holding the link yieldably in a predetermined position.

4. In a bicycle-frame, the combination with a crank-hanger having a seat-tube fixed thereto, of tie-rods hinged to the crank-hanger, rear forks connected with the tie-rods and having their upper ends slotted, recesses in the walls of the slots, a link disposed between the slotted ends of the rear fork and having a transverse perforation, a clamping-bolt passed through the slots and the perforation, washers disposed upon the bolt and having lugs engaging the recesses, pivotal connections between the link and the seat-tube, and means for holding the link yieldably in a predetermined position.

5. In a bicycle-frame, the combination with two separable parts, one of which is provided with ears adapted to receive the other part between them, and said ears being provided with slots having recesses in their walls, a bolt passed through the second part and lying in the slots of the first part, washers upon the bolt and having projections adapted to enter the slots and lie in the recesses in the walls thereof to hold the bolt from movement longitudinally of the slots, and nuts upon the bolt adapted to hold the washers in their opposite positions.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

VIRGEL H. MILLS.

Witnesses:
JAS. B. NORRIS,
JOHN H. T. MILLS.