No. 644,787. Patented Mar. 6, 1900.

G. H. WILLIAMS.

BICYCLE FRAME.

(Application filed Dec. 15, 1898.)

(No Model.)

FIG. I.

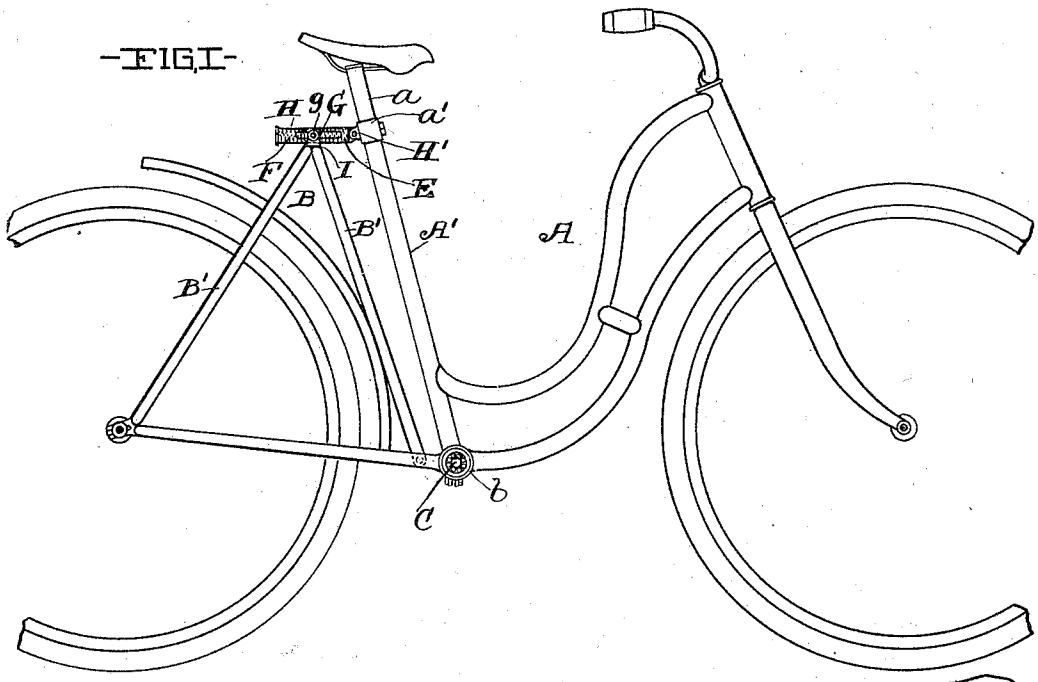


FIG. II.

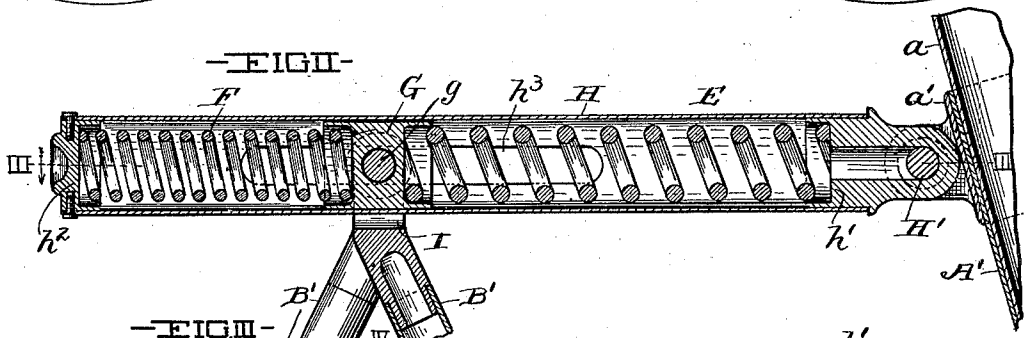
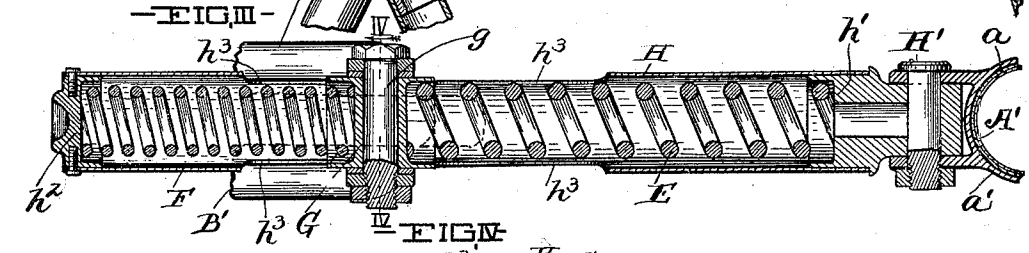
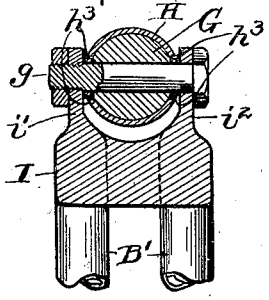


FIG. III.



IV FIG. IV.



WITNESSES:

Daniel E. Daly.

A. H. Parrall

INVENTOR

Gordon H. Williams

BY

Dyer & Wormely

his ATTORNEYS

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

UNITED STATES PATENT OFFICE.

GURDON H. WILLIAMS, OF CLEVELAND, OHIO.

BICYCLE-FRAME.

SPECIFICATION forming part of Letters Patent No. 644,787, dated March 6, 1900.

Application filed December 15, 1898. Serial No. 699,348. (No model.)

To all whom it may concern:

Be it known that I, GURDON H. WILLIAMS, of Cleveland, county of Cuyahoga, and State of Ohio, have invented certain new and useful Improvements in Bicycle-Frames; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

My invention relates to spring-frames for bicycles, and more especially to such frames as are formed of two portions or sections hinged together at the bottom and have a spring connection between their upper ends.

My invention comprises, essentially, a peculiar construction of the spring connection between the two frame-sections, and consequently consists in certain combinations and arrangements of parts hereinafter described, and pointed out in the claims.

In the drawings, Figure I is a side elevation of a portion of a bicycle embodying my invention, and the operating shaft is shown in section in this figure. Fig. II is a side sectional view illustrating, respectively, my improved spring connection between the two frame-sections of the machine. Fig. III is a top plan of the spring connection on line III III, Fig. II. Fig. IV is a vertical section on line IV IV, Fig. III.

The framework of my improved machine comprises a forward section A and a rear section B, as shown in Fig. 1 of the drawings. The said frame-sections A and B are hinged together in any approved manner at the bottom. The rear frame-section is connected to the rear or driven wheel of the machine, whereas the forward frame-section is connected in the usual manner with the forward wheel of the machine.

b designates the hinge connection between the two frames, which hinge connection supports the operating-shaft C.

The rear frame-section B is preferably a triangular frame, having upright bars converging toward their upper ends and connected together at their lower ends in any approved manner.

A′ designates the rear upright bar of the forward frame-section A, which bar forms the standard or support for the saddle-post *a*. The bar A′ is arranged a short distance forward of and almost parallel with the forward upright bar B′ of the rear frame-section B. The upwardly-converging bars B′ of the rear frame are connected together at their upper ends by a head or yoke I, that is secured at its lower end in any approved manner to the said bars. Yoke or head I at its upper end has two arms i' and i^2 projecting upwardly at opposite sides, respectively, of a hollow bar H, that is arranged horizontally or approximately horizontally and longitudinally of the machine. The chamber of the bar H is closed at its ends partially or wholly, so as to form two inwardly-facing walls h' and h^2 at opposite ends, respectively, of the said chamber. The bar H extends forwardly and rearwardly of and over the upper end of the rear frame-section and has its forward end pivoted horizontally in any approved manner, as at H′, to a collar *a*′, that is mounted or formed upon the upper portion of the saddle-post standard A′. A block G is arranged within the chamber of the bar H and is pivoted horizontally and transversely of the bar, as at *g*, to the arms i' and i^2 of the head or yoke I. The chamber of the bar H has its side walls slotted longitudinally of the bar, as at h^3, and the pivotal bolt *g* extends through the slots h^3, that accommodate not only the location of the said bolt, but an endwise shifting of the bar H independently of the block G and an endwise shifting of the latter independently of member H.

The operation of the forward spring E will of course be vastly more appreciated when the rear wheel of the machine strikes an obstruction, because the rider's seat is approximately arranged over the said wheel.

The spring F is normally under tension, and therefore causes the spring-abutment-forming block G to bear more or less against the forward spring and places the latter under some tension. The two springs are prevented from rattling by the normal tension of the rear spring and the pressure by the said spring upon the forward spring through the interposed block G. The rear spring F presents another and more important function in cushioning the forward spring so that the latter upon the recoil following its compression will not vibrate the machine, and thereby avoid rendering the rider uncomfortable

by the shock that would take place in the absence of the rear or auxiliary spring F. The pivotal connection between the spring-bearing bar H and the forward frame-section and the pivotal connection between the bearing-forming block G and the rear frame-section accommodate a vertical tilting of the said bar during the operation of the spring connection, and the said manner of connecting the spring-bearing bar H and the block G to the forward frame-section and rear frame-section, respectively, is obviously essential in order to accommodate the tilting of either frame-section upwardly and toward and independently of the other frame-section, and the hinge connection *b* between the two frame-sections is arranged with its axis horizontally and transversely of the framework, so as to accommodate the aforesaid tilting of the frame-sections. Two springs E and F are confined within the chamber of the bar H between opposite ends, respectively, of the block G and opposite end walls, respectively, of the said chamber. The spring E is arranged, therefore, within the chamber of the bar H between the forward end of member G and the forward end wall of the said chamber, and the spring F is arranged within the said chamber between the rear of the member G and the rear end wall of the chamber. The forward spring E is about twice as heavy as the rear spring F.

The operation of my improved spring connection between the two frames is as follows: When the forward wheel in operating the machine strikes an obstruction and is thereby lifted so as to result in tilting the forward frame-section upwardly and rearwardly upon the hinge connection between the said frame-section and the rear frame-section, the spring-bearing bar H shifts rearwardly upon the bearing-forming block G, and thereby compresses the forward spring E and prevents the rider from receiving a shock that would in the absence of the spring connection result from the encounter of the machine with the aforesaid obstruction. The rear wheel upon striking an obstruction in the operation of the machine will be lifted, and thereby tilt the rear frame upwardly and forwardly upon the hinge connection between the said frame and the forward frame and result in the shifting of the block G forwardly within the bar H and result in the compression of the forward spring E, and thereby prevent the rider from annoyingly feeling the striking of the obstruction.

What I claim is—

1. The combination with a bicycle's framework composed of a forward section and a rear section hinged together horizontally at the bottom horizontally and transversely of the machine; of a spring connection arranged between the upper ends of the said frame-sections and comprising the following: a bar pivoted horizontally and transversely of and extending rearwardly from the forward frame-section; a block pivoted horizontally and transversely of the said bar to the rear frame-section and arranged to afford bearing for and shiftable endwise of the bar, and two springs supported from the bar and confined between opposite ends, respectively, of the aforesaid block and opposite ends, respectively, of the bar, substantially as and for the purpose set forth.

2. The combination with a bicycle's framework comprising a forward frame-section and a rear frame-section horizontally and transversely hinged together at the bottom; of a spring connection between the upper ends of the frame-sections, which spring connection comprises the following: a bar extending rearwardly from the upper end of the forward frame-section to and over the rear frame-section, which bar is pivoted horizontally and transversely, at its forward end, to the forward frame-section; two upwardly-projecting arms formed upon the rear frame-section and arranged at opposite sides, respectively, of the aforesaid bar; a block arranged to afford bearing for and shiftable endwise of the said bar and pivoted, horizontally and transversely of the bar, to the aforesaid arms, and two springs confined between opposite ends, respectively, of the aforesaid block, and opposite ends, respectively, of the bar, substantially as and for the purpose set forth.

3. The combination with a bicycle's framework comprising a forward frame-section and a rear frame-section horizontally and transversely hinged together at the bottom, and a spring connection between the upper ends of the two frame-sections, which spring connection comprises the following: a hollow bar extending rearwardly from the upper end of the forward frame-section to and over the rear frame-section and having an internal chamber extending from end to end of the bar and provided with end walls, which bar is transversely pivoted to the forward frame-section; a block arranged within the said chamber and pivoted horizontally and transversely of the chambered bar to the rear frame-section and shiftable endwise of the said chamber; two springs confined within the chambered bar between opposite ends, respectively, of the said block, and opposite end walls, respectively, of the chamber of the bar, and the forward spring being heavier than the rear spring.

4. The combination with a bicycle's framework comprising a forward section and a rear section horizontally and transversely hinged together at the bottom; of a hollow bar extending forwardly and rearwardly over the rear frame-section and transversely pivoted to the forward frame-section, which bar has an internal chamber extending from end to end of the bar and having end walls, which chamber has its side walls slotted longitudinally of the bar, as at h^3, and two arms formed upon the rear frame-section and projecting upwardly at opposite sides, respectively, of

the aforesaid bar; a block arranged within the aforesaid chamber above the rear frame-section and pivoted, transversely of the bar, to the aforesaid arms, and having the pivot-forming member or members extending laterally through the slots of the side walls of the aforesaid chamber; two springs confined within the bar between the block and opposite end walls, respectively, of the bar, substantially as and for the purpose set forth.

Signed by me at Lorain, Ohio, this 25th day of October, 1898.

GURDON H. WILLIAMS.

Witnesses:
W. B. THOMPSON,
CHAS. E. WOOTERS.