No. 645,682. Patented Mar. 20, 1900.

M. FITZ-SIMMONS & W. J. & W. B. FITZ SIMMONS.

BICYCLE.

(Application filed July 10, 1899.)

(No Model.) 2 Sheets—Sheet 1.

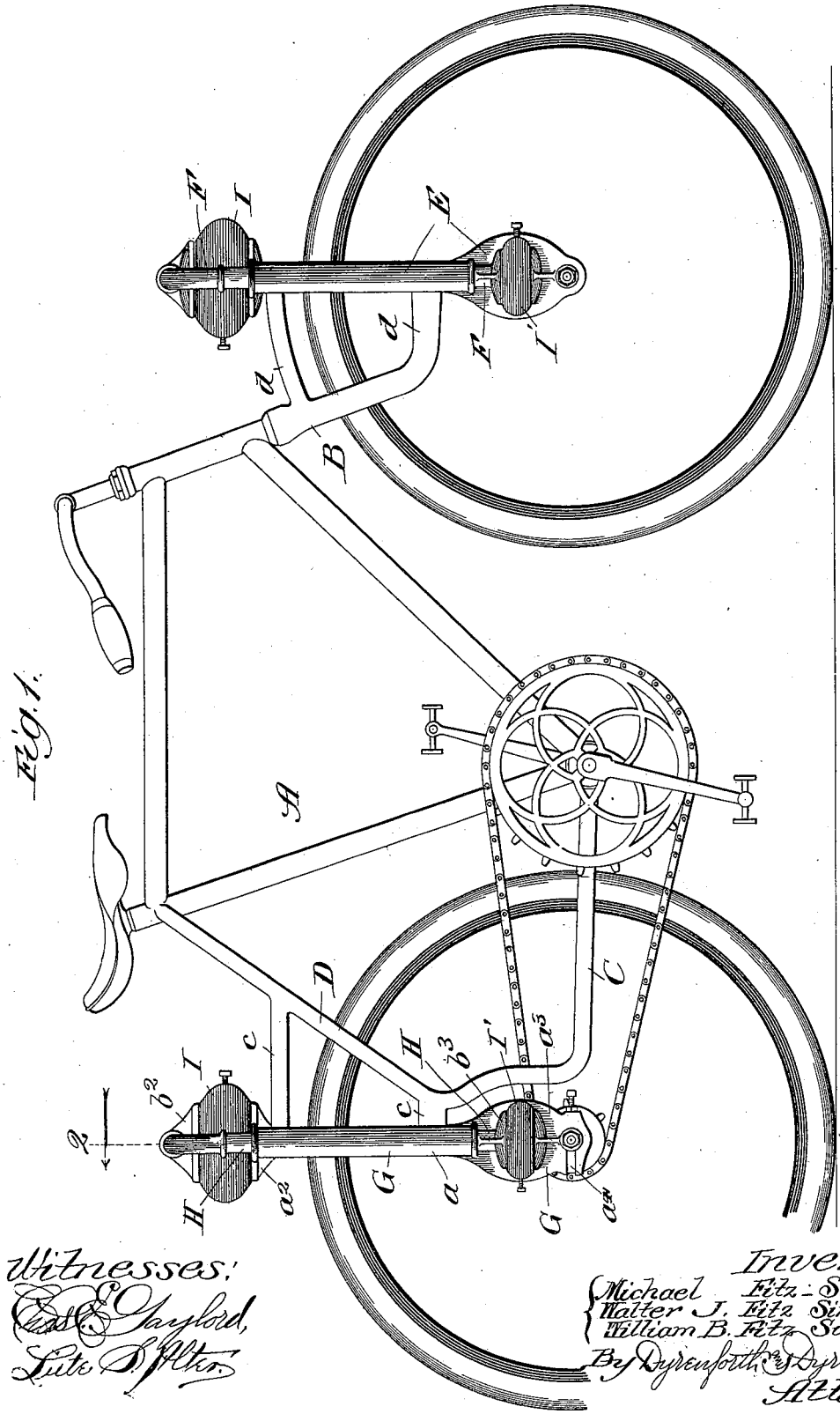

Fig. 1.

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Fig. 2.

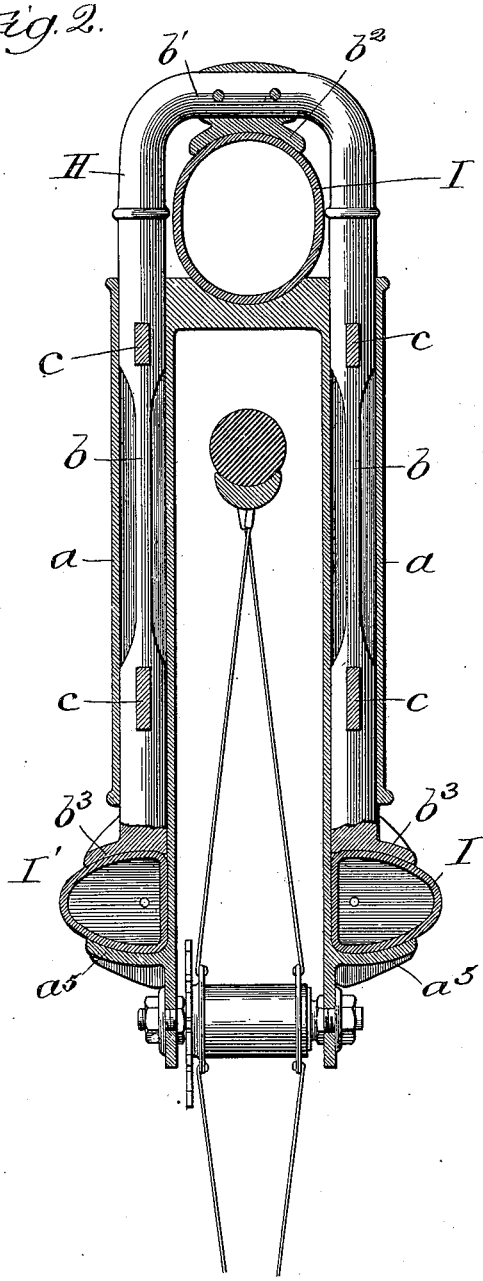
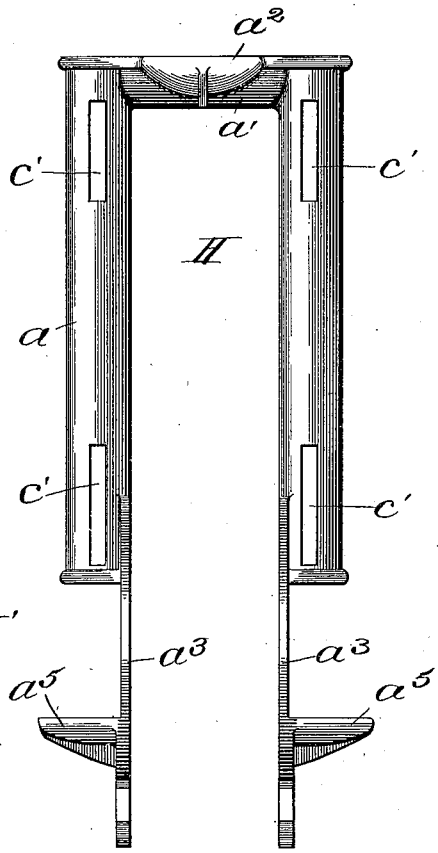


Fig. 3.



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UNITED STATES PATENT OFFICE.

MICHEAL FITZ-SIMMONS, WALTER J. FITZ SIMMONS, AND WILLIAM B. FITZ SIMMONS, OF CHICAGO, ILLINOIS.

BICYCLE.

SPECIFICATION forming part of Letters Patent No. 645,682, dated March 20, 1900.

Application filed July 10, 1899. Serial No. 723,320. (No model.)

To all whom it may concern:

Be it known that we, MICHEAL FITZ-SIMMONS, WALTER J. FITZ SIMMONS, and WILLIAM B. FITZ SIMMONS, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Bicycles, of which the following is a specification.

Our invention relates particularly to an improvement in the frame construction of bicycles of that class employing springs or air-cushions for yieldingly supporting the frame from the wheel-shafts, the object being to render the use of pneumatic tires unnecessary for ordinary riding purposes.

In carrying out our invention we employ at both front and rear wheel-shafts substantially-vertical inverted-U-shaped guide standards or supports, at the front and rear forks of the frame substantially-vertical inverted-U-shaped heads slidably connected with said standards, and between said standards and heads and supporting the latter, and through their medium the frame proper, air-cushions, springs, or other yielding pressure-transmission shock-dissipating means. Otherwise stated, the main frame is yieldingly supported between front and rear substantially-vertical guide-standards, which permit movement of the frame at either end within the limits allowed by the yielding supports in substantially a vertical direction, thus obviating the binding effects incident to the use of guides of very appreciable inclination.

The preferred form of connection is shown in the accompanying drawings, in which—

Figure 1 is a view in side elevation of a bicycle embodying our improvements; Fig. 2, a transverse vertical section, as indicated at line 2 of Fig. 1; and Fig. 3 a front view of the preferred form of the rear guide-standard.

A represents the main frame; B, the front fork; C, the rear lower fork; D, the rear upper fork; E, a front vertical guide-standard supported from the front-wheel shaft; F, a front vertical guide-head virtually forming a part of the front fork B, which is thus of novel form; G, a rear vertical guide-standard supported from the rear-wheel shaft; H, a rear vertical guide-head virtually forming a part of the rear forks C D, which are thus of novel form, and I I′ top and side pneumatic cushions, respectively, upon which the main frame is supported at its front and rear ends.

The rear guide-standard, Fig. 3, comprises preferably-vertical guide-cylinders a, top connecting-web a', provided with a hollowed cushion-plate a^2, flattened vertical portions a^3, provided with slots a^4 for the rear-wheel shaft, and hollowed side cushion-plates a^5, projecting laterally outward from the parts a^3.

The rear guide-head comprises vertical members b, moving in the guideways a, top connecting-web b', supplied with a follower cushion-plate b^2, and lower end or side follower cushion-plates b^3, coacting with the stationary side plates a^5. The guide-head H is connected with the rear forks C D by members c, which move in slots c' in the tubes a, said members being preferably brazed or welded to the rear forks. The members c, preferably, are tubular in form, with flattened rear ends entering the slots c' and secured to the guide-head in any suitable manner.

The front guide-standard E is similar in construction to the rear standard G, except that it is provided at its forked lower end with perforations instead of slots for the wheel-shaft, and the guide-head F is similar to the guide-head H. Members d connect the guide-head to and virtually constitute the same a part of the front fork B.

The guide-standards E and G are each integrally formed, being of inverted-U shape, with connecting-web above the top of the wheel. The guide-heads H and F are likewise each integrally formed, being of inverted-U shape, with connecting-webs above the connecting-webs of the guide-standards. Thus a strong and durable construction is provided.

It is evident that the tension of the chain will vary somewhat when the rear guide-head of the frame moves with relation to the rear guide standard or support. No disadvantage arises from this, however, if the chain be adjusted when the wheel is under a load equal to or slightly greater than its normal load. This appears from a consideration of the fact that the rear end of the frame will oscillate between its lowest limit under jarring action and its position under quiet normal load and

from the fact that the movement at the front sprocket-wheel is practically only one-half the movement at the rear end of the frame.

What we claim as new, and desire to secure by Letters Patent, is—

1. In a bicycle, the combination with a frame provided with a fork, of a substantially-vertical inverted-U-shaped guide-head rigidly secured to said frame-fork and provided with a cushion-plate, an inverted-U-shaped guide-standard in which said guide-head moves, said guide-standard being provided with a cushion-plate and at its lower extremities with shaft-openings, and a pneumatic cushion confined between said plates, substantially as and for the purpose set forth.

2. In a bicycle, the combination of a frame A provided with rear forks C D having rigidly connected therewith a substantially-vertical inverted-U-shaped guide-head H, an inverted-U-shaped guide-standard G provided with guide-cylinders for the vertical members of said guide-head and with flattened lower ends supplied with shaft-openings, cushion-plates on said guide-standard and guide-head, and pneumatic cushions between said plates, substantially as and for the purpose set forth.

3. In a bicycle, the combination of a frame provided with a fork, a substantially-vertical inverted-U-shaped guide-head attached to said frame-fork provided at its web above the wheel with a top cushion-plate and provided near its lower extremities with side cushion-plates, an inverted-U-shaped guide-standard supported vertically from a wheel-shaft and provided at its web above the wheel and beneath the web of said guide-head with a cushion-plate and provided also at its lower extremities with side cushion-plates, and pneumatic cushions confined between their respective plates, substantially as and for the purpose set forth.

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In presence of—
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D. W. LEE.