No. 723,486. PATENTED MAR. 24, 1903.

C. E. PIERCE.

BICYCLE.

APPLICATION FILED MAR. 4, 1902.

NO MODEL.

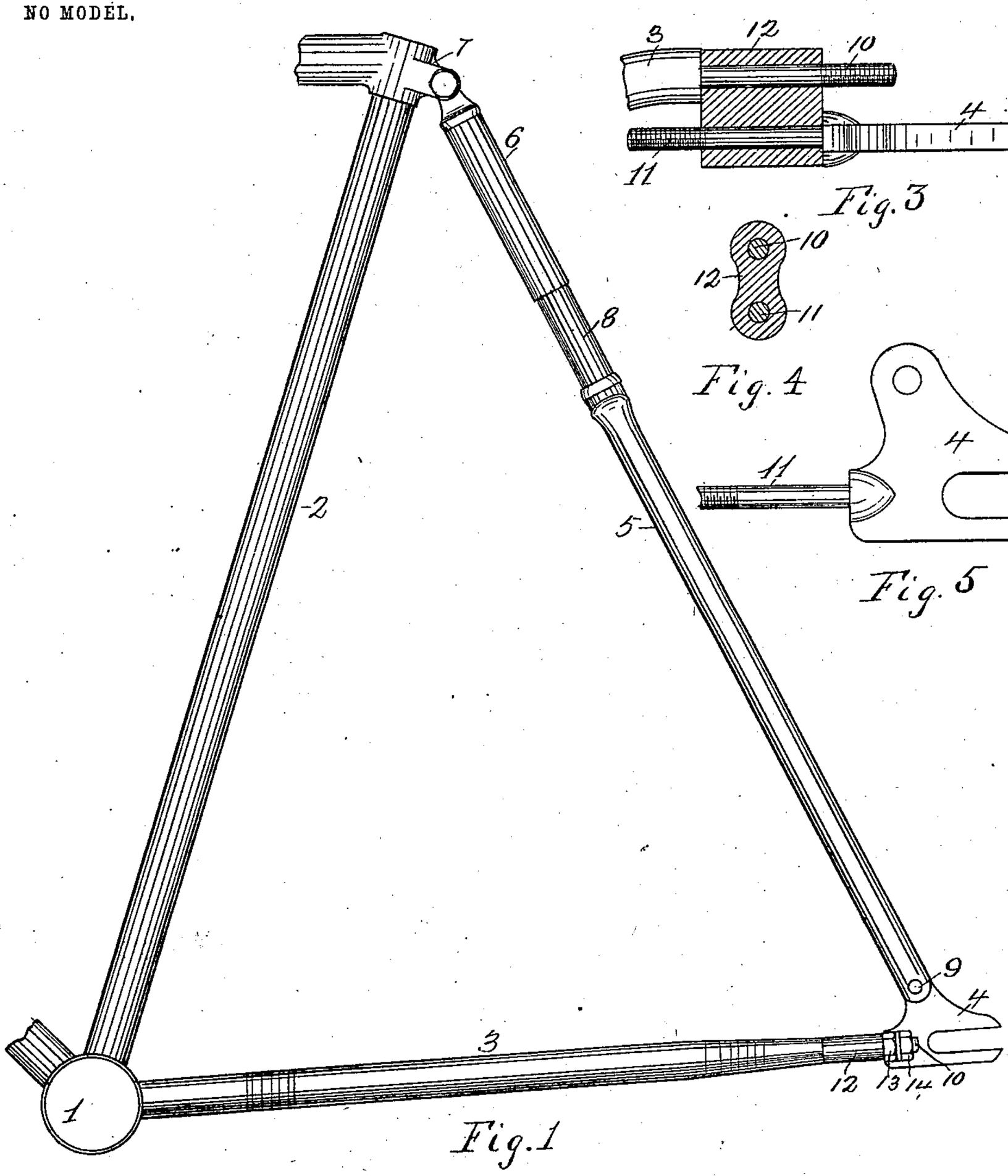

Fig. 1

Fig. 3

Fig. 4

Fig. 5

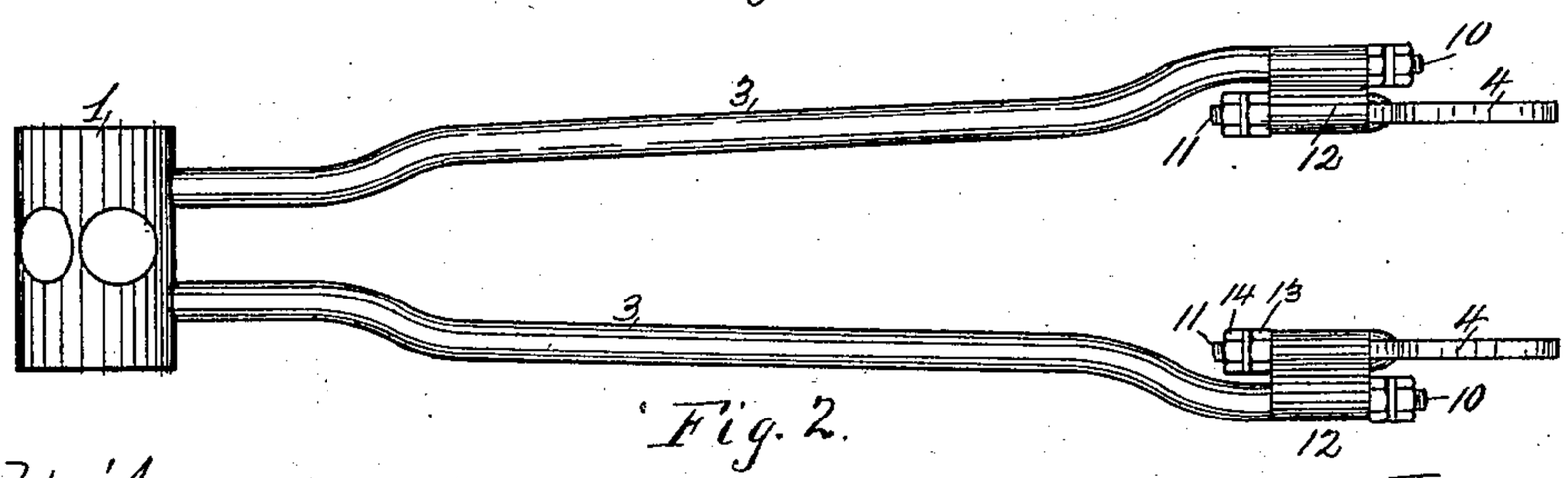

Fig. 2.

Witnesses:

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UNITED STATES PATENT OFFICE.

CHARLES E. PIERCE, OF BUFFALO, NEW YORK.

BICYCLE.

SPECIFICATION forming part of Letters Patent No. 723,486, dated March 24, 1903.

Application filed March 4, 1902. Serial No. 96,604. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. PIERCE, a citizen of the United States, residing at Buffalo, New York, have invented certain new and useful Improvements in Bicycles, of which the following is a full, clear, and exact description.

My invention relates to bicycles, and more particularly to resilient or cushion frames for the same. Specifically it relates to improved means for pivotally uniting the members of the frame to coact with the spring or cushion, and whereby I am enabled to dispense with the hinge or yielding spring connection between the rear forks and the crank-hanger.

To that end my invention consists of pivotal connections between the rear forks and the rear fittings which permit of the alternate lengthening and shortening of the rear braces, due to the extension or compression of the spring, while the rear forks retain a substantially fixed position with reference to the crank-hanger.

Heretofore in the construction of so-called "cushion-frame" bicycles a large amount of yielding movement has been employed, and while it has successfully removed jar and vibration from the saddle and frame it has resulted in such a degree of movement and such a variation in reach between saddle and pedal as to render it objectionable to many and to render the machine worthless for racing purposes. I have found that a very small yielding quality is adequate to overcome the objectionable vibration, but that this is not successfully accomplished merely by using a stronger spring. A spring sufficiently sensitive to respond to small vibrations must be used and means provided to overcome or limit large movement. This I accomplish, and I regard the same as one of the important features of my invention.

Referring to the drawings herewith, in which like characters of reference indicate corresponding parts, Figure 1 is a side elevation of the rear portion of a wheel-frame provided with my invention. Fig. 2 is a plan view of the rear forks, crank-hanger barrel, and the rear fittings. Fig. 3 is a horizontal section, on an enlarged scale, of my link. Fig. 4 is a central cross-section of the same. Fig. 5 is an elevation of one of the rear fittings.

The barrel of the crank-hanger is shown at 1.

2 is the pillar.

3 represents the rear forks.

4 represents the rear fittings.

5 is the rear brace.

6 is the upper member of the spring-tube.

7 is the saddle-post, fitting to a lug on which the upper member 6 of the spring-tube is pivoted, and 8 is the lower member of the spring-tube, which is rigidly secured to the brace 5.

The spring device is of the ordinary construction, and consists, as above stated, of a member 6, pivoted to the saddle-post fitting, and a lower member 8, rigidly secured to the brace 5. These tubes telescope and surround a helical spring, which may be of any desired resistance or rigidity to adapt the machine to the weight of the rider. The brace 5 is of the ordinary forked pattern and is pivoted to the rear fittings 4, as shown at 9 in Fig. 1.

Thus far the construction is substantially the same as heretofore used, with the exception that the forks 3 are rigidly secured to the barrel 1. The forks 3 are bent outwardly by a compound bend to lie outside the vertical plane of the fittings 4, but are in horizontal plane and parallel therewith. Into the rear ends of the forks 3 are rigidly secured pivots 10, which are threaded to receive nuts. The fittings 4 have pivots 11 rigidly secured to their forward ends and are threaded to receive nuts. These pivots lie in the same horizontal plane and are parallel to each other. Taking over the pivots 10 and 11 are links 12, having parallel bearings to receive said pivots 10 and 11, and are held in position by means of nuts 13 and check-nuts 14.

By reference to Figs. 1 and 2 it will be seen that the forks 3 are made of flattened tubing with the flattened sides in vertical. This is a preferable construction to aid in the yielding movement I am about to describe.

When the fittings 4 move by reason of the compression or extension of the spring within the tubes 6 and 8, the pivots 11 will constitute axes about which the links 12 will describe a small arc of a circle, and the pivots 10 will move transversely in a horizontal

plane a very small distance to meet such curvilinear movement of the links 12; but since on an ordinary machine an extreme movement from greatest compression to greatest extension would hardly equal three-quarters of an inch the lateral movement of the forks to conform thereto would not be more than one-eighth of an inch to each fork, and while forks of cylindrical tubing will readily conform to such movement a flattened tubing, as described, will offer less resistance thereto and in addition will have greater resistance to any vertical movement. On the other hand, the forks 3 not being hinged to the barrel 1 tend to check any extreme movement due to the spring, and thus prevent the "teter" movement, which is so objectionable in an ordinary spring or cushion frame.

It should be noted that in setting up and adjusting the machine the pivots 10 and 11 should lie substantially in horizontal plane when the rider is in the saddle, so that the parts will be in the most advantageous position to overcome the small slight jars and vibrations which by their great frequency cause by far the greatest strain both upon machine and rider.

It will be evident that other forms of link construction may be employed, and I do not wish to limit myself to the specific construction shown.

Having thus described my invention and its method of operation, what I claim is—

1. In combination with a frame, a spring in the rear brace, rear forks and rear fittings, of pivots interposed between the rear forks and the rear fittings, comprising pivot-pins secured to the rear ends of said rear forks and to the front ends of said rear fittings so that they lie substantially parallel to the length of the machine and links having parallel borings engaging said pivot-pins substantially as and for the purposes set forth.

2. In combination with a frame, a spring in the rear brace, rear forks and rear fittings, of pivoted links to compensate the action of said spring, interposed between the front ends of the rear fittings and the rear ends of the rear forks, substantially as and for the purposes set forth.

3. In combination with a frame, a spring in the rear brace, rear forks and rear fittings, of links connecting the rear forks and the rear fittings pivotally by means of pivot-pins rigidly secured to the front ends of said rear fittings and to the rear ends of said rear forks and engaging said links whereby the action of said spring is compensated by the movement of the rear ends of said rear forks over an arc of a circle substantially in a vertical plane and substantially at angles to the length of the machine, substantially as and for the purposes set forth.

4. In combination with a frame, a spring in the rear brace, rear forks and rear fittings, of pivots secured to the rear ends of said rear forks, pivots secured to the front ends of said rear fittings and links engaging said pivots to form a pivot-joint to compensate the action of said spring, substantially as and for the purposes set forth.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

CHARLES E. PIERCE.

Witnesses:
D. B. TUTTLE,
JOHN F. CALLAN.