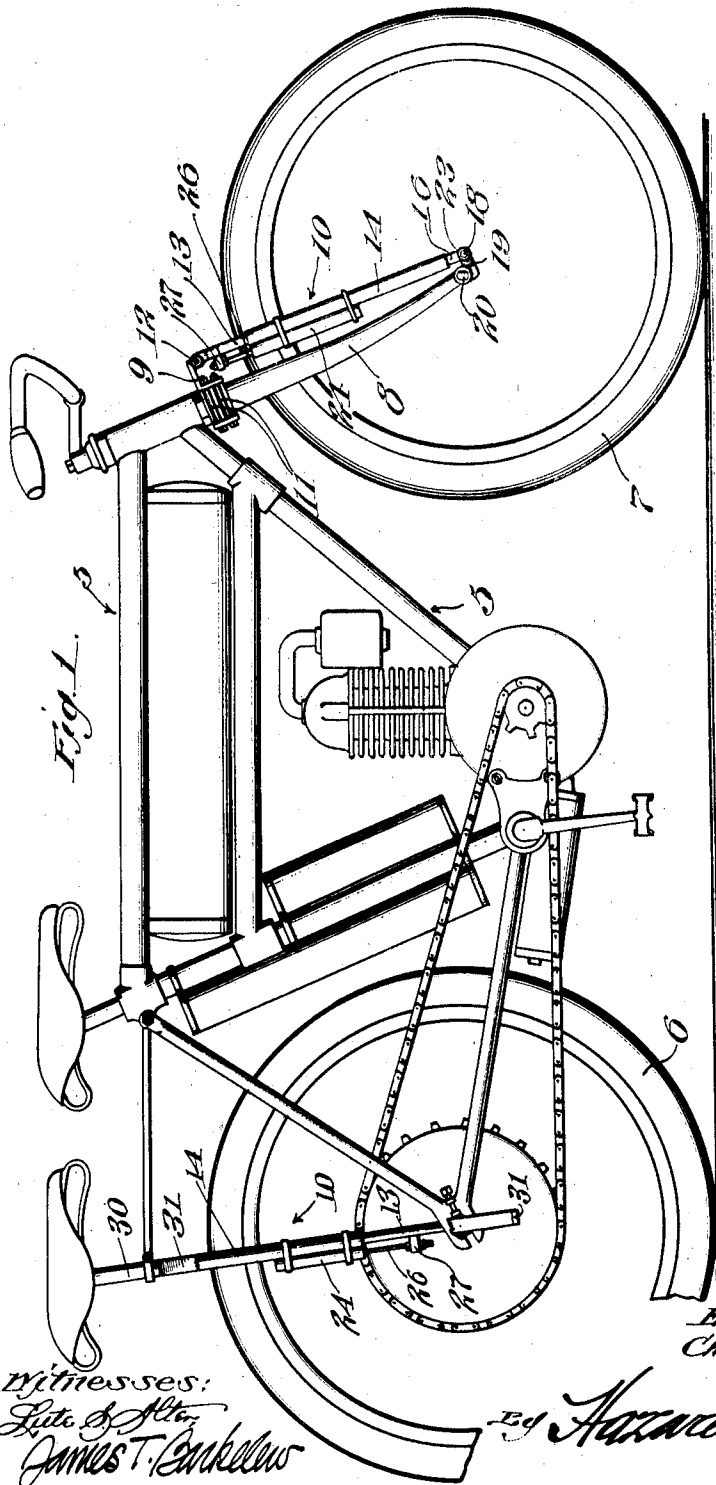


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 SPRING BICYCLE FORK.
 APPLICATION FILED MAY 5, 1908.

901,447.

Patented Oct. 20, 1908.

2 SHEETS—SHEET 1.



Witnesses:
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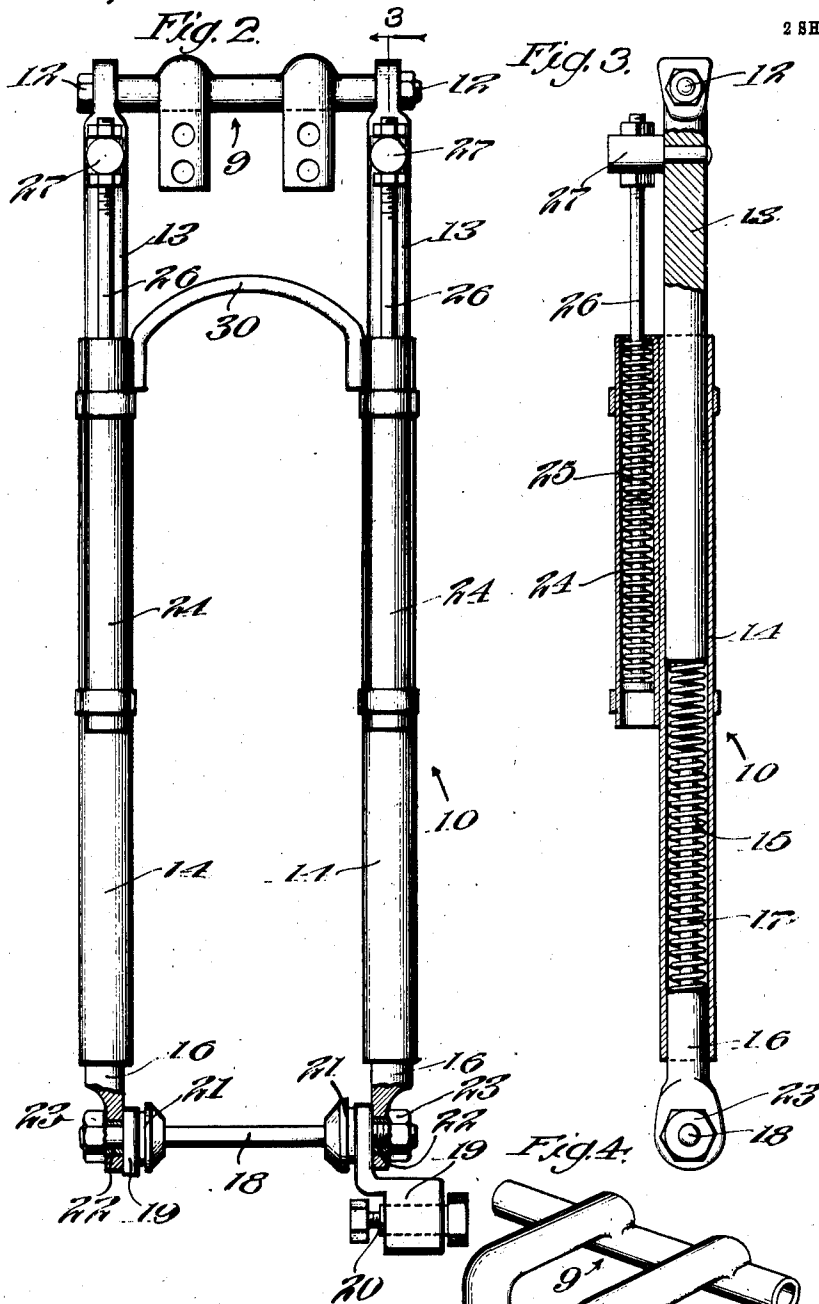
By Howard Starnes,
 Attorney

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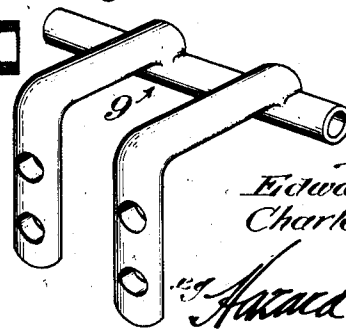
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

EDWARD W. HOAG AND CHARLES R. KITTLE, OF LOS ANGELES, CALIFORNIA.

SPRING BICYCLE-FORK.

No. 901,447.

Specification of Letters Patent.

Patented Oct. 20, 1908.

Application filed May 5, 1908. Serial No. 430,915.

To all whom it may concern:

Be it known that we, EDWARD W. HOAG and CHARLES R. KITTLE, citizens of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Spring Bicycle-Forks, of which the following is a specification.

This invention relates to an improved form of spring fork designed to obviate the difficulties heretofore experienced with such fork. These difficulties consisted mainly in the lateral non-rigidity of the front wheel so that it was liable to come into contact with the fork, especially in turning curves where the stress upon the wheel is not perfectly vertical.

To overcome these difficulties we have provided a spring fork which will resiliently support the frame from the front wheel and at the same time hold it against undesired lateral motion relative to the frame. Further, we have provided a resilient means of such a nature that the wheel is allowed a long movement relative to the frame, thus carrying the frame smoothly at all times. We accomplish this by means of the device described herein and illustrated in the accompanying drawings, in which:—

Figure 1,—is a side elevation of a motor-cycle provided with our improved fork. Fig. 2,—is an enlarged rear elevation of the spring members of the fork. Fig. 3,—is a section taken on line 3—3 of Fig. 2. Fig. 4,—is a perspective detail of the bracket by means of which the spring members are secured to the fork head.

We have illustrated in the drawings a motor-cycle, spring fork of the character of our invention most usually being applied to motor-cycles, but it is obvious that the fork may be applied as well to a wheeled vehicle of any sort.

In the drawings 5 designates a frame of a motor-cycle of typical construction supported by wheels 6 and 7. The usual equipment of front fork 8 is shown, our spring fork including in combination a comparatively rigid member which forms a base member for our fork and which is best supplied by the standard fork. It will be understood that any form of fork may be used, the construction not being limited to forks having a

three piece crown as illustrated in the drawings.

A bracket 9, shown in detail in Fig. 4, is provided to secure the upper ends of resilient members 10 to the fork crown, bolts 11 being used for this purpose. This bracket may be made in any configuration to suit the form of the fork to which it is designed to be attached and is not necessarily constructed as shown in the drawings. The object of this bracket is to pivotally support the upper end of resilient member 10 and this is conveniently done by a bolt 12 passing through the bracket and through the upper ends of plungers 13. These plungers are adapted to reciprocate in cylinders 14, heavy coiled springs 15 supporting the plungers in their normal position as illustrated. The lower ends of cylinders 14 are each provided with a plug 16 upon which spring 15 rests and a rod 17 projecting upwardly from the plug inside of the spring forms a positive stop for the downward movement of the plungers thereby preventing such an excessive movement as may throw the rider from the motor-cycle. The lower ends of plugs 16 are flattened and are bored to receive axle 18 of front wheel 7. A small connecting member 19 is adapted to connect the wheel axle with the lower ends of fork 8 on each side, the ends of the fork being secured by means of bolts 20. As shown in Fig. 2 these bolts are provided with a shoulder so that they may be tightly screwed up on the end of the fork and connecting pieces 19 will still be allowed to freely rotate around the bolt. The end of connecting piece 19 which connects with the wheel axle is held between cone 21 and sleeve 22 formed as a part of nut 23. The length of this sleeve is such that piece 19 is tightly pressed against cone 21 to lock it in position on the axle and allow the lower end of plug 16 to rotate freely around the sleeve.

From the foregoing construction it will be seen that any upward movement of front wheel 7 will be absorbed by springs 15 and that the excessive upward movement will be prevented by means of rod 17. To provide for absorbing the rebound which would otherwise throw the frame of the motor-cycle upwardly a small cylinder 24 is provided on the rear side of each of cylinders 14 and coiled springs 25 therein are adapted to prevent the

upward movement of rods 26. These rods are adjustably secured to studs 27 mounted on plungers 13 so that springs 25 act directly upon the plungers. Springs 25 are lighter in action than springs 15, the ratio in strength between the two springs being determined by the weight of the motor-cycle and other conditions. Upon the rebound of springs 15 and the consequent tendency to force the frame upwardly, springs 25 come into action and resiliently absorb the upward movement. Thus it will be seen that the wheel may have considerable vertical movement without any sensible movement of the frame as the movements of the wheel in both directions are entirely taken up and absorbed by the two sets of springs.

Cylinders 14 are secured together at their upper ends by a cross stay 30 brazed or otherwise secured to them. Thus, when the axle is secured between the lower ends of the resilient members the whole structure forms a solid and rigid rectangle which must move as a whole and will therefore not allow any irregular or lateral movement of the wheel. This rigidity against lateral movement is also promoted by having connecting pieces 19 of as short extent as possible and providing long bearings for the same on bolts 20, as shown in Fig. 2. Thus the wheel is prevented from binding against the fork by any lateral motion of its axle.

In Fig. 1, the application of our fork to the rear seat of a motor-cycle is illustrated. In this position resilient members 10 are inverted from their position for the front fork, cylinder 14 being connected to seat post 30 at the top and plunger 13 connected to the rear wheel axle below. The customary foot rest 31 is provided, being partly broken away in the illustration to disclose the resilient member behind it. By this means the rear seat is carried free from the vibrations of the rear wheel, the resilient members allowing of a long resilient movement in distinction to the short vibrations allowed by the customary single stiff spring utilized in forks of this character.

Having described our invention, what we claim as new and desire to secure by Letters Patent is:—

1. A spring fork for a wheel, comprising a base member, a resilient member affixed at its upper end to said base member and movably connected at its lower end to said base member, the lower end of said resilient member being further connected to the wheel axle at its lower point of connection to said base member.

2. A spring fork for a wheel, comprising a base member, a resilient member affixed at its upper end to said base member and at its lower end to the wheel axle, and a toggle connection between the point of connection to the wheel axle and said base member.

3. A spring fork for a wheel, comprising a base member, a spring member affixed to the upper end and movably connected to the lower end of said base members and also connected to the wheel axle at its point of attachment to said base member at the lower end, said spring member composed of a pair of inter-sliding parts, and resilient means to oppose the movements of said parts in both directions.

4. A spring fork for a wheel, comprising a rigid base member, a spring member secured to the upper end of said base member and also movably secured thereto at the lower end, and also connected to the wheel axle at its point of attachment to said base member, at the lower end, said spring member comprising a pair of intersliding members, resilient means to oppose the compression of said inter-sliding members, and a resilient means of lesser strength to oppose the extension of said inter-sliding members.

In witness that we claim the foregoing we have hereunto subscribed our names this 29th day of April, 1908.

E. W. HOAG.
CHAS. R. KITTLE.

Witnesses:

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