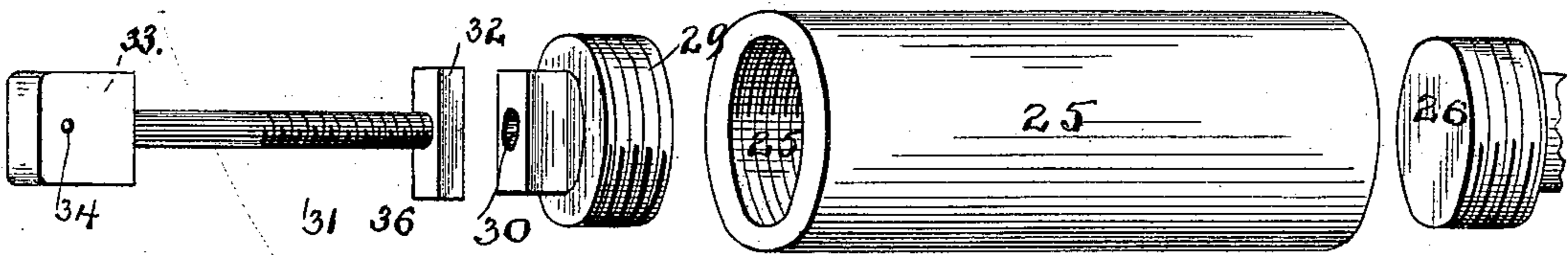
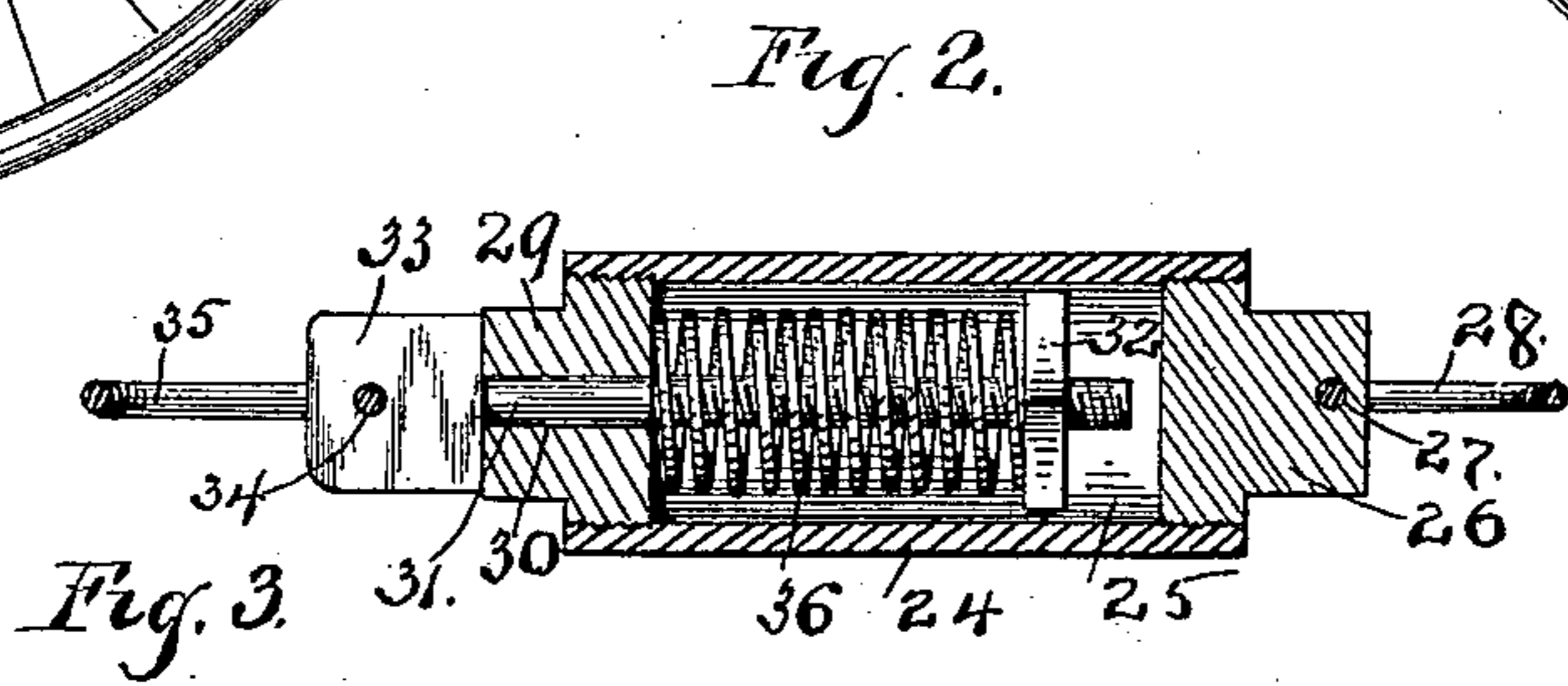
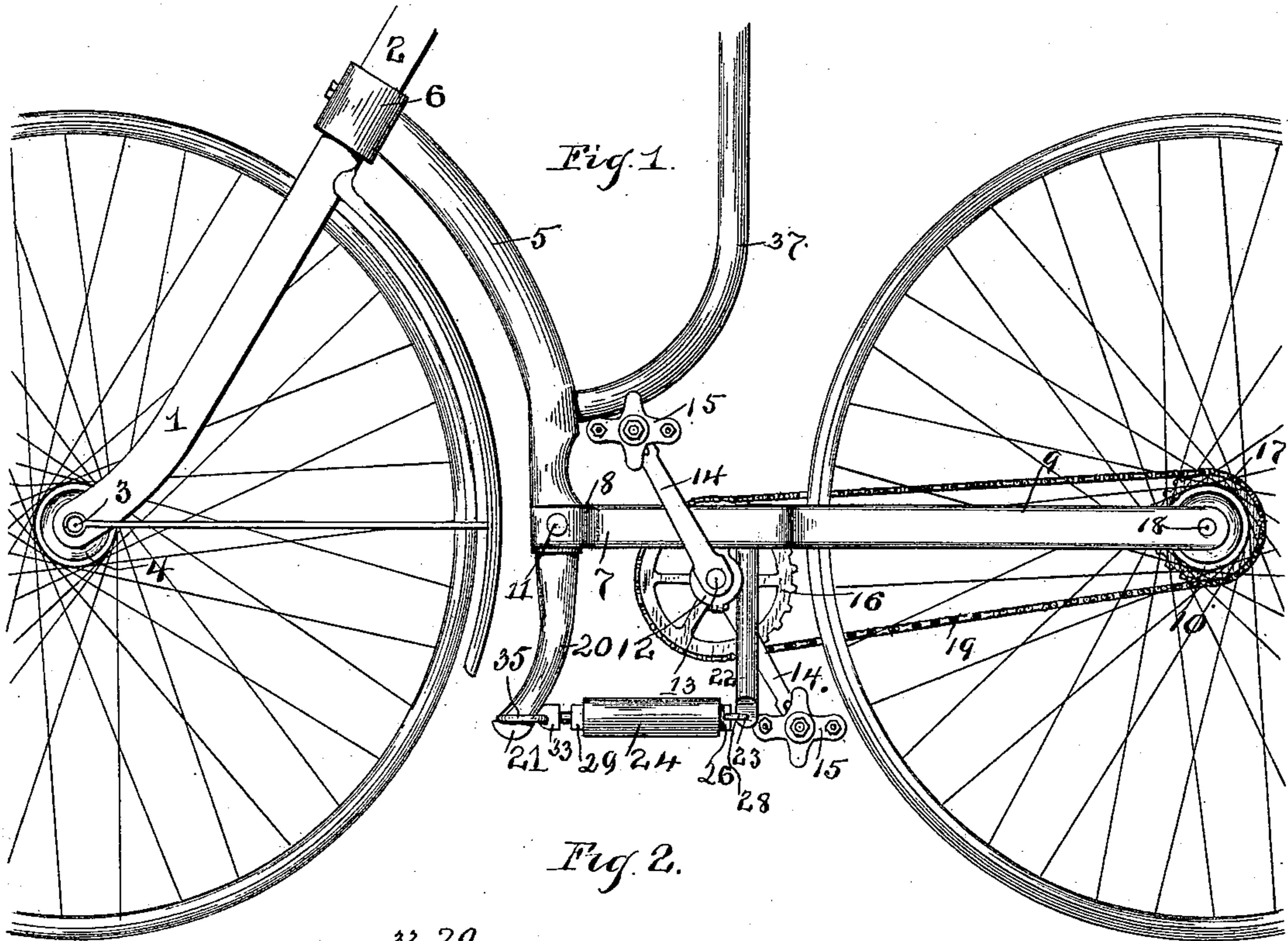


(No Model.)

J. H. MATHEWS.  
BICYCLE.

No. 463,710.

Patented Nov. 24, 1891.



Witnesses:

H. G. Seitz

W. S. Duval

By his Attorneys,

C. A. Snow & Co.

Inventor

J. H. Mathews

# UNITED STATES PATENT OFFICE.

JAMES H. MATHEWS, OF LUDINGTON, MICHIGAN.

## BICYCLE.

SPECIFICATION forming part of Letters Patent No. 463,710, dated November 24, 1891.

Application filed June 13, 1891. Serial No. 396,148. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES H. MATHEWS, a citizen of the United States, residing at Ludington, in the county of Mason and State of Michigan, have invented a new and useful Bicycle, of which the following is a specification.

This invention relates to improvements in Safety bicycles, the objects in view being to provide a bicycle of this class of great simplicity, durability, elasticity, and by the latter to avoid the necessity of employing the usual seat-spring or spring-forks, thereby decreasing the cost of the machine to this extent.

Other objects and advantages of the invention will appear in the following description, and the novel features thereof will be particularly pointed out in the claims.

Referring to the drawings, Figure 1 is a side elevation of a bicycle constructed in accordance with my invention. Fig. 2 is an enlarged detail in longitudinal section of the spring connection. Fig. 3 are detail views of these several parts composing the spring-barrel.

Like numerals of reference indicate like parts in all the figures of the drawings.

In practicing my invention I employ the usual front fork 1, which above the fork is reduced to form the head 2, and upon the axle 3 of the fork is mounted the front or steering wheel 4.

5 designates the curved downwardly-disposed backbone of the machine, which terminates at its upper end in a suitable neck having a collar 6 formed thereon, which is loosely mounted over the spindle or head.

7 designates the reach of the machine, and the latter is bifurcated at its front end, as at 8, and at its rear end, as at 9, the latter receiving the usual bearing-axle and having mounted thereon the rear or drive wheel 10. The front bifurcation of the reach loosely embraces and is pivoted by a bolt 11 to the lower end of the backbone 5. In rear of the point or pivot 11 a journal-hanger 12 depends from the reach, and in the same is mounted for rotation the drive-shaft 13, from the ends of which extend the cranks 14, carrying the pedals 15. A large sprocket 16 is mounted upon the shaft 13, and is connected to a small sprocket 17 of the drive wheel shaft 18 by

means of a sprocket-chain 19. Depending from the lower end of the curved backbone 5 is a forwardly-curved front hanger 20, provided at its lower extremity with a notch or hook 21. A vertical hanger 22 also depends from the reach 7, immediately in rear of the hanger 12, and is provided at its lower end with a perforation or eye 23.

Between the front and rear hangers 20 and 22 I interpose the spring connection 24, which I will now proceed to describe. 25 designates a cylindrical hollow barrel, in the rear end of which is threaded a plug 26, having an eye 27, in which is loosely connected a link 28, said link also being loosely connected to the eye 23 of the depending standard 22. At its front end a plug 29 is threaded therein and provided with a central opening 30, communicating with the interior of the barrel 25. A plunger-rod 31 is loosely mounted for movement in the opening 30, has threaded at its inner end within the barrel a set-nut 32, and at its outer end terminates in a head 33, having a perforation or eye 34, in which is loosely mounted a link 35, said link removably engaging the hook or notch 21. This completes the construction of the spring connection, with the exception of a coiled spring 36 of suitable tensile strength, said spring being mounted upon the plunger 31, between the front plug 29 and the head 32 of the plunger. It will be obvious that springs of varying tensile strength may be employed, they being governed in accordance with the weight of the rider; and, furthermore, that by removing the front hanger and rotating the plunger within its head the resistance or strength of the spring may be increased or decreased, as desired, and as occasioned by the wear of the spring or change of riders of greater or lesser weight. From the backbone 5, immediately above the pivot 11, there is secured a seat post or standard 37, the same being rearwardly and upwardly curved and having mounted therein in the usual manner the saddle.

It will be seen from the foregoing description that inasmuch as the weight of the rider is directly above and between the terminals of the spring connection all his movements will be vertical in contradistinction to the front and rear pitching, as caused by what are commonly known as "spring-forked" ma-

chines. The vibrations of the wheels passing over inequalities of the road—stones and other objects—will not be communicated by sudden shocks and jars to the rider; and, furthermore, that said vibrations will be in a great degree lessened and lose their injurious effect upon the wheels, both front and rear, and their bearings, whereby the durability of the machine will be greatly increased.

10 Having described my invention, what I claim is—

1. In a Safety bicycle, the combination, with the front fork, the rearwardly and downwardly curved backbone, the hanger depending from the end of the same and terminating in a hook, a horizontally-disposed reach bifurcated to embrace and pivoted to the lower end of the backbone, and a hanger having an eye depending from the reach in rear of its bifurcation, of a barrel, a threaded plug mounted in the rear end of the barrel and having an eye, a suspension-link connecting the same with the eye of the rear hanger, a perforated plug mounted in the front end of the barrel, a plunger-rod terminating at its inner end in a head and having at its outer end an eye mounted in the perforation of the

front plug, a coiled spring mounted upon the rod between its head and the front plug, said head being adjustable, and the suspension-link connected to the eye of the plunger and removably engaging the hooked end of the front hanger, substantially as specified. 30

2. In a Safety bicycle, the combination, with the front fork, the rearwardly-curved and downwardly-disposed backbone loosely connected with the fork, the hanger depending from the backbone, the horizontally-disposed straight reach bifurcated at its front end and pivoted to the backbone above the hanger, the rear hanger depending from the reach in rear of the bifurcation, of the seat-standard extending rearwardly and upwardly from the backbone above and between the two hangers, and the spring connection between said hangers, substantially as specified. 35 40 45

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

JAMES H. MATHEWS.

Witnesses:

GILBERT H. BLODGETT,  
EDWARD DECKER.