(No Model.)

F. SWEETLAND.

BICYCLE.

No. 482,067. Patented Sept. 6, 1892.

Fig. 1.

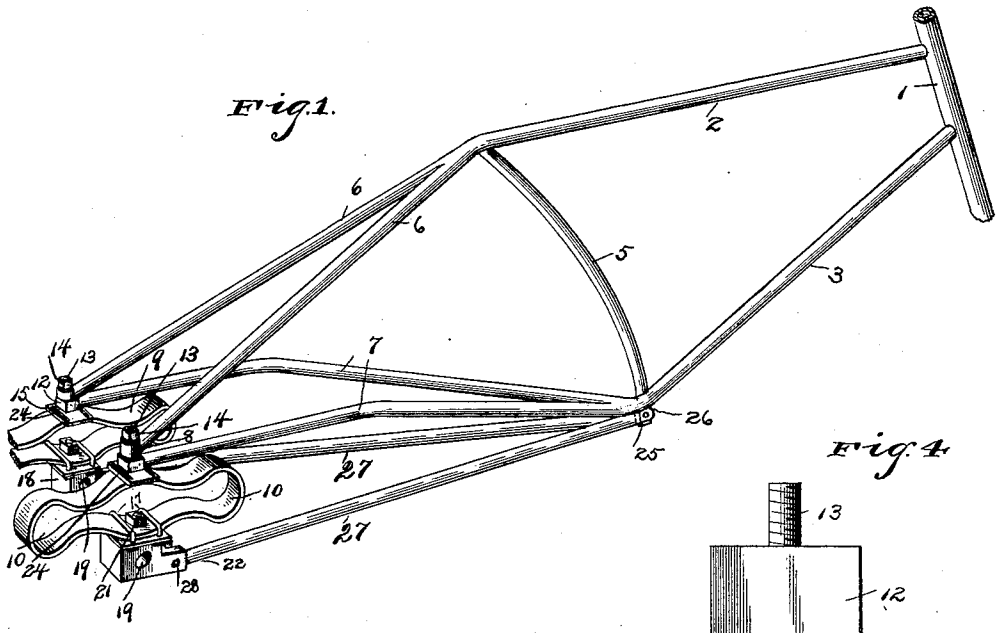


Fig. 4.

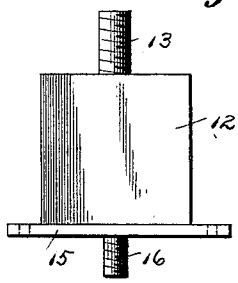


Fig. 2.

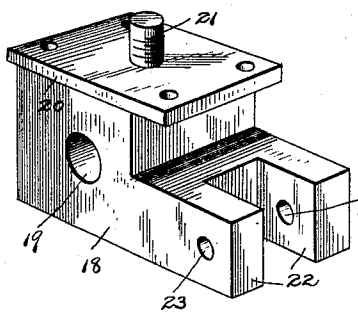
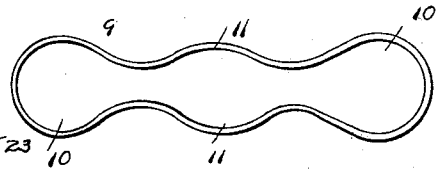


Fig. 3.



Witnesses

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UNITED STATES PATENT OFFICE.

FRANK SWEETLAND, OF ANGOLA, NEW YORK.

BICYCLE.

SPECIFICATION forming part of Letters Patent No. 482,067, dated September 6, 1892.

Application filed February 10, 1892. Serial No. 420,994. (No model.)

To all whom it may concern:

Be it known that I, FRANK SWEETLAND, a citizen of the United States, residing at Angola, in the county of Erie and State of New York, have invented a new and useful Bicycle, of which the following is a specification.

This invention relates to improvements in bicycles, and to that particular class thereof known as "Safeties."

The objects of the invention are to provide an improved spring for the rear wheel, or, in other words, to be interposed between the axle of the rear wheel and the rear end of the frame, and to so construct the spring as to be extremely easy and comfortable to the rider, thoroughly adapted to consume all jar, and to prevent any sudden bumping or jolting, even after the tensile strength of the main portion of the spring has been overcome to such an extent as to collapse the spring.

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 perspective of a bicycle-frame embodying my invention. Fig. 2 is a detail of one of the axle blocks or bearings. Fig. 3 is a similar view of one of the springs. Fig. 4 is a side elevation of the frame-supporting block.

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

1 designates the front steering-rod, and extending rearwardly from the same, between the head and fork of the machine, are the upper and lower reach-rods 2 and 3, respectively, the former being substantially horizontal and the latter declining. The rear ends of the two reach-rods are connected by an intermediate, preferably curved, standard 5. From the upper reach-rod 2 extends rearwardly and declines the upper reach-rod fork 6, while from the lower reach-rod there extends rearwardly and upwardly the lower reach-rod fork 7. The rear extremities of these forks meet, and each terminates in an eye 8, the pairs of eyes, if desired, being brazed together or formed integral. The perforations or eyes may be of any desired form when viewed in cross-section.

A pair of springs 9 is employed, and they are of the bow or elliptical shape. Each spring has its ends bowed gradually, as at 10, and between its ends the longitudinal sides of the springs are slightly bowed, as at 11, so that at each side of its center the spring is narrowest, for a purpose hereinafter specified.

12 designates a metal block, a pair of which is employed, and each is provided at its upper side with a threaded tenon 13, such a tenon being passed through each of the pair of eyes 8, and the block is secured, therefore, to the reach-rod sections 6 and 7 by means of nuts 14.

Each block 12 is provided with an enlarged base 15 and with a depending stud 16. The depending studs 16 pass through the center portions of the upper longitudinal sides of the springs 9 and are nutted upon their under sides, as shown. U-shaped clips 24 have their terminals passed downwardly at the opposite edges of the springs at opposite sides of the depending stud 16 and also through pairs of perforations formed in the bases 15 of the bearing-blocks 12.

18 designates the axle-blocks, there being a pair of the same, and these blocks are provided with bearing-perforations 19 for the rear axle of the machine upon their upper sides and with an enlarged base 20, from the center of which rises a threaded stud 21. At the front side of the block a pair of ears 22 is formed, and these have a transverse perforation 23. These axle-blocks are secured to the lower longitudinal sides of the springs by means of inverted-U-shaped clips 17, the terminals of which are passed at the sides of the springs and through perforations in the bases 20 of the blocks.

27 designates a brace-rod for bracing the springs. Two of these rods are employed, the front ends thereof being loosely pivoted by means of a bolt 26 to the juncture of the front and rear lower bars 3 and 7, and their rear ends are entered between the ears 22, to which they are pivoted by bolts 28.

It will be obvious that various means may be provided for securing the front ends of the brace-rod 27 to the framework and also their rear ends to the blocks 18. These blocks, also, may be modified and made to conform to various shapes, and, in fact, so also may the shape of the frame be changed and the springs, all of which is contemplated

by me, and I have herein illustrated and described merely my preferred construction.

It will be seen that in operation the rear wheel, jolting over the rough road, will be permitted to move vertically in accordance with the undulations of the road and that the jolts will be absorbed by the springs 9. A disadvantage in springs of this class lies in the fact that when their tensile strength has been overcome by the severity of the jolt their opposite longitudinal halves are brought together with considerable force, unpleasant to the rider and injurious to the frame, and it is for the purpose of avoiding this unpleasantness and disadvantage that I provide the longitudinal sides of the springs with the offsets or bowed portions 11. Now when the springs become so depressed as to bring the nearest or most adjacent portions of their opposite halves into contact instead of abruptly stopping the bowed portions 11 constitute what might be termed an "inner" or "secondary" spring and are much stiffer than the main springs, and hence prevent to a great degree the jolting and sudden stoppage and gradually overcome the former.

From the foregoing description, in connection with the accompanying drawings, it will at once be obvious that I have provided a yielding connection of great efficiency and simplicity for the rear axle and frame of Safety bicycles, so that comfort to the rider is given, as well as the framework as a whole greatly relieved of the sudden strains to which it is usually subjected and which so often causes snapping of the frame. The brace-rod 27 maintains the boxes or blocks 18 and 12 directly in vertical alignment and removes the longitudinal strain from the springs 9.

Having described my invention, what I claim is—

1. In a machine of the class described, the combination, with the framework bifurcated at its rear end to form a fork, each of the bifurcations terminating in eyes, a pair of blocks having tenons fitting the eyes, and nuts threaded on the tenons, said blocks being provided at their lower ends with base-plates having a depending tenon and pairs of perforations, of a pair of axle-blocks having transverse axle-receiving openings and their upper sides provided with base-plates having upwardly-disposed studs and pairs of perforations, the bowed springs interposed between the upper and lower blocks, U-shaped clips passing at the opposite sides of the springs and through the base-plates, nuts mounted on the clips, and a brace-bar pivotally connected to the lower block and at its front end to the framework, substantially as specified.

2. In a machine of the class described, the combination, with the rear end of the framework and the axle-supporting blocks, of the intermediate springs 9, having the gradually-curved ends 10 and upper and lower central oppositely-bowed portions 11, substantially as specified.

3. The combination, with the upper and lower reaches 2 and 3, the upper and lower sockets 4, the latter being provided with the pairs of perforated ears 25, the upper and lower converging forks 6 and 7, terminating in eyes, and the blocks 8, secured to the eyes, of the pairs of bow-springs 9, the lower axle-blocks 18, having the ears 22, and the brace-bars 27, pivoted between the ears 22 and 25, substantially as specified.

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

FRANK SWEETLAND.

Witnesses:
WM. H. RYNECK,
E. M. CLARK.