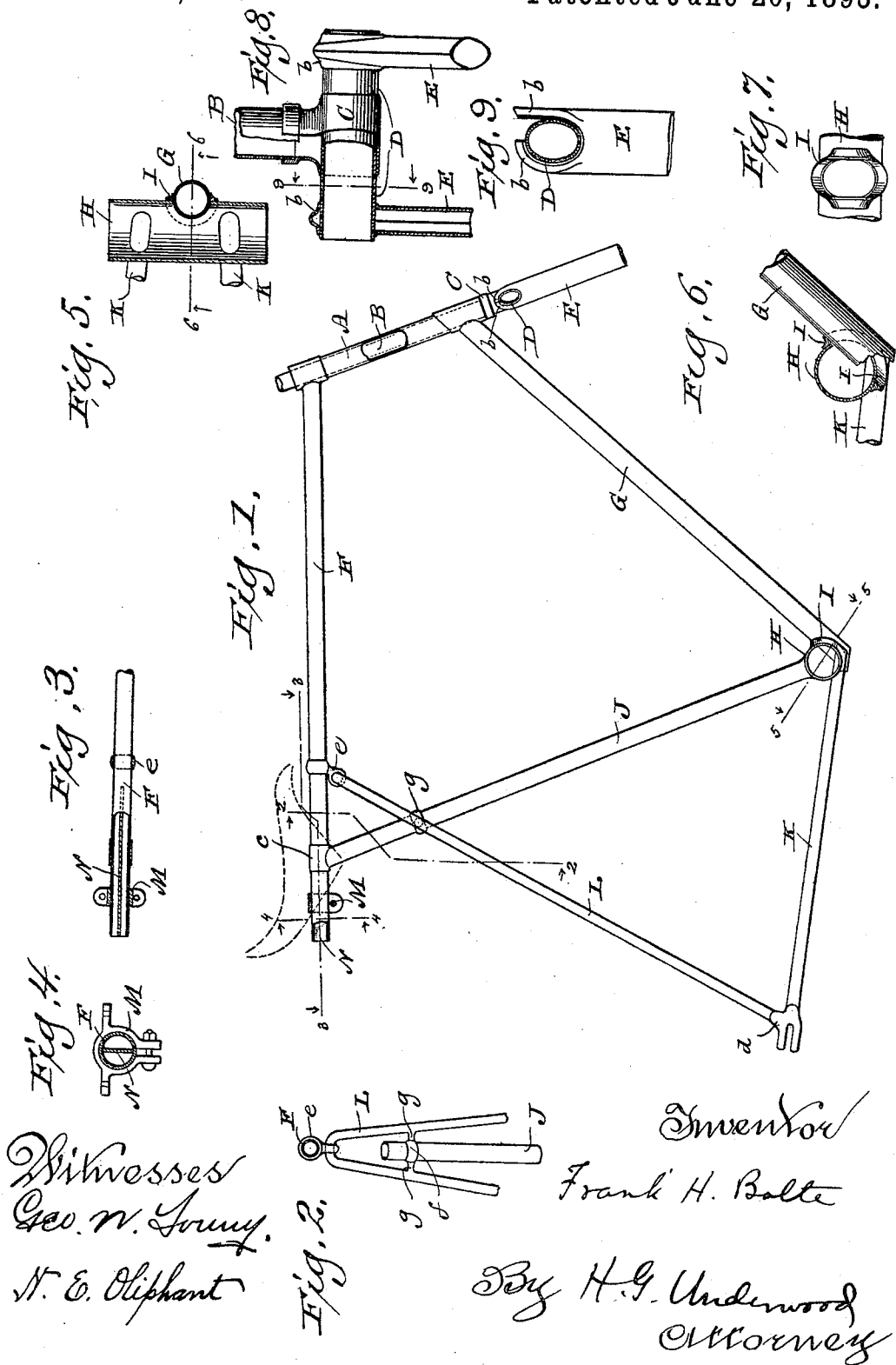


(No Model.)

F. H. BOLTE.
BICYCLE FRAME, &c.

No. 499,707.

Patented June 20, 1893.



UNITED STATES PATENT OFFICE.

FRANK H. BOLTE, OF MILWAUKEE, WISCONSIN, ASSIGNOR TO THE SERCOMBE-BOLTE MANUFACTURING COMPANY, OF SAME PLACE.

BICYCLE-FRAME, &c.

SPECIFICATION forming part of Letters Patent No. 499,707, dated June 20, 1893.

Application filed November 22, 1892. Serial No. 452,757. (No model.)

To all whom it may concern:

Be it known that I, FRANK H. BOLTE, a citizen of the United States, and a resident of Milwaukee, in the county of Milwaukee, and in the State of Wisconsin, have invented certain new and useful Improvements in Bicycle-Frames, &c.; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention has for its object to improve the construction of bicycles by providing a frame and steering fork having a maximum of strength in comparison to a minimum of weight, and said invention consists in certain peculiarities of construction and combination of parts hereinafter described with reference to the accompanying drawings and subsequently claimed.

In the drawings: Figure 1 represents a side elevation of my improved frame and a portion of the steering fork; Figs. 2, 3, 4 and 5 detail sections respectively taken on lines 2-2, 3-3, 4-4 and 5-5 of the preceding figure; Fig. 6, a like view taken on line 6-6 of Fig. 5; Fig. 7, a plan view of a portion of the crank-hanger inverted; Fig. 8 a detail front elevation of my improved fork-joint partly in section, and Fig. 9, a section taken on line 9-9 of the preceding figure.

Referring by letter to the drawings A represents a steering-head in the form of a vertically disposed tube that forms the front of my improved frame and receives the shank B of the steering-fork. In the present instance the steering-fork shank B is a tube having its lower end brazed or otherwise rigidly secured in an eye-socket C and likewise secured in the horizontal or eye portion of the socket is another tube D, the latter and socket-eye being preferably of elliptical contour. The branches E of the fork are also tubular and primarily notched at their upper ends to engage the horizontal tubes D, the notches being sufficiently deep as to permit of the adjacent portions b of the fork-branches being bent down upon said horizontal tube, the joint thus formed being afterward made permanent by brazing. By this construction, I avoid the employment of the usual drop-forgings at the joint between the fork-shank

and branches, thereby reducing weight without any sacrifice of strength.

Brazed to the steering-head or front-tube A are rearwardly diverging reach-tubes F, G, the first or upper one of which is approximately horizontal and the other at an acute angle thereto. The lower reach-tube G has its rear lower end brazed to a tubular crank-hanger H that is similar to the one set forth in my prior Patent No. 478,391, of July 5, 1892, the same consisting of a section of tubing cut out to form seats that engage the adjacent frame tubes.

In order to obtain a greater bearing and brazing surface for the reach-tube G on the crank-hanger H, I now provide the latter with a continuous flange I that overlaps said reach-tube, this flange being an improvement on my prior construction of said crank-hanger. Like flanges may be arranged to surround the other seats in the crank-hanger if found necessary or desirable. Brazed at its lower end to the crank-hanger is a vertically disposed stay-tube J, shown as having its upper end provided with a horizontal eye c that engages the upper reach tube F, and is brazed thereto, but this braze-joint may be otherwise formed without departure from my invention.

Like in my above named patent, rearwardly extended tubes have their forward ends brazed in seats cut in the under side of the tubular crank-hanger, the rear ends of these tubes K and the terminals of a centrally bent tube L being joined to supports d for the rear axle of the complete bicycle. The centrally bent tube L forms an arch that engages an eye-coupling e fast on the upper reach-tube F in front of the stay-tube J, whereby the diverging portions of the arch necessarily cross said stay-tube and with the latter form a very strong brace for said reach-tube. As best illustrated in Fig. 2, the stay-tube J is provided with a rigid collar f having lugs g brazed to the arch-tube L and thus this latter tube also serves as a means for bracing the former as well as the upper reach-tube.

The frame herein described is ordinarily built to order in proportion to the reach of the rider, and therefore it is preferable to have the upper tube F extend a certain dis-

tance in rear of the stay-tube J to receive a saddle-clip M, the latter being shown in Figs. 1, 3 and 4. In this construction of the frame the rear portion of tube F is stiffened by the insertion of a diametrical plate N as is also shown in Figs. 1, 3 and 4, but it would be no departure from the spirit of my invention to so join the tubes F, J, as to permit of the latter receiving a vertically adjustable saddle-post.

It is possible to utilize rods instead of tubes for any or all of the parts F, G, J, K, and L, but tubes are preferable for many well known reasons. However in some respects one is the equivalent of the other and therefore the term tube herein employed is to be construed for itself or said equivalent without specific qualification.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A bicycle steering-fork comprising a shank in the form of a tube, a horizontal tube rigidly connected at its center to the lower end of the shank, and tubular branches having eyes formed in their upper ends and these eyes rigidly engaged by the horizontal tube, substantially as set forth.

2. A bicycle-frame comprising a vertically disposed steering-head, reach-tube diverging rearward from the steering-head, a crank-hanger joined to the lower reach-tube, a stay-tube connecting the crank-hanger and upper reach-tube, other tubes extended rearward from said crank-hanger, an arch-like brace connected at its apex to the upper reach-tube in front of the stay-tube, and axle-supports connecting those tubes that extend rearward from the crank-hanger with the lower terminals of said brace, substantially as set forth.

3. A bicycle-frame comprising a vertically disposed steering-head, reach-tubes diverging rearward from the steering-head, a crank-hanger joined to the lower reach-tube, a stay-tube connecting the crank-hanger and upper reach-tube, other tubes extended rearward from said crank-hanger, an arch-like brace connected at its apex to the upper reach-tube in front of the stay-tube, a rigid connection between the branches of the brace and said

stay-tube at the crossing-point of the same, and axle-supports connecting those tubes that extend rearward from the crank-hanger with the lower terminals of said brace, substantially as set forth.

4. A bicycle-frame comprising a vertically disposed steering-head, reach-tubes diverging rearward from the steering-head, a crank-hanger joined to the lower reach-tube, a stay-tube connecting the crank-hanger and upper reach-tube some distance forward of the rear end of the latter tube, other tubes extended rearward from said crank-hanger, an arch-like brace connected at its apex to the upper reach-tube in front of the stay-tube, and axle-supports connecting the lower terminals of the brace with those tubes that extend rearward from the aforesaid crank-hanger, substantially as set forth.

5. A bicycle-frame comprising a vertically disposed steering-head, reach-tubes diverging rearward from the steering-head, a crank-hanger joined to the lower reach-tube, a stay-tube connecting the crank-hanger and upper reach-tube some distance forward of the rear end of the latter tube, a stiffening-plate in the rearwardly extended portion of said upper reach-tube, other tubes extended rearward from said crank-hanger, an arch-like brace connected at its apex to the aforesaid upper reach-tube in front of the stay-tube, and axle-supports connecting the lower terminals of the brace with those tubes that extend rearward from the aforesaid crank-hanger, substantially as set forth.

6. A bicycle-frame provided with a crank-hanger in the form of a section of tubing cut out to form seats that engage the adjacent frame tubes, and having a flange surrounding at least one of said seats, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand, at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

FRANK H. BOLTE.

Witnesses:

N. E. OLIPHANT,
JOHN E. WILES.