No. 620,833. Patented Mar. 7, 1899.

H. BELCHER & F. EASOM.

JOINT FOR BICYCLE FRAMES.

(Application filed Jan. 8, 1898.)

(No Model.)

Fig. 1

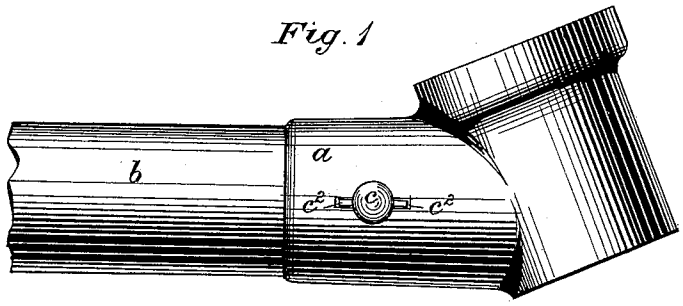


Fig. 2.

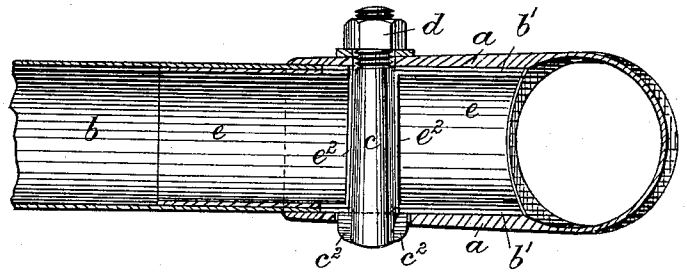


Fig. 3.

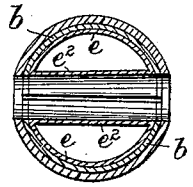
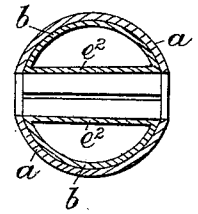


Fig. 4.



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UNITED STATES PATENT OFFICE.

HENRY BELCHER AND FREDERICK EASOM, OF BEESTON, ENGLAND.

JOINT FOR BICYCLE-FRAMES.

SPECIFICATION forming part of Letters Patent No. 620,833, dated March 7, 1899.

Application filed January 8, 1898. Serial No. 666,076. (No model.)

To all whom it may concern:

Be it known that we, HENRY BELCHER and FREDERICK EASOM, subjects of the Queen of Great Britain, residing at Beeston, England, have invented new and useful Improvements in Joints for Bicycle-Frames, of which the following is a specification.

This invention relates to means for fixing the ends of the tubes of bicycle-frames in their lugs or sockets without brazing; but it may also be applied to the fixing together of the tubular parts of handle-bars, seat-pillars, forks, and other tubular parts of velocipedes.

Our invention consists in the construction, arrangement, and combination of parts hereinafter described, and illustrated in the accompanying drawings, for detachably fixing the ends of the frame-tubes and other tubular parts of velocipedes in their lugs and sockets, whereby a very secure attachment of the said tubes and parts can be readily and quickly effected and when required for transit, storage, or repair the said tubes and parts may be readily detached and packed into a small compass. Further, by the arrangement constituting our invention the manufacture of bicycle-frames and the like is simplified and the temper of the metal of the tubes is not interfered with. The said construction and arrangement also provide a more efficient connection of the frame-tubes and other tubular parts of velocipedes than is obtained in detachable joints of the ordinary construction, the accidental detachment of joints constructed according to our invention being practically impossible.

Our invention is especially useful where the frame-tubes and other tubular parts of velocipedes and like vehicles are made of aluminium or aluminium alloys in consequence of the difficulty which exists in obtaining a secure attachment of the parts of articles made of aluminium or aluminium alloys by brazing.

We will describe our invention in connection with the attachment of the top horizontal tube of the frame of a safety-bicycle to the top lug of the said frame.

In the accompanying drawings, forming part of this specification, Figure 1 is a side elevation of the top lug and portion of the top horizontal tube of a safety-bicycle frame, the said tube being fixed in the said lug by our improved means. Fig. 2 is a horizontal sectional view thereof; and Fig. 3 is a cross-sectional view taken centrally through the crossing tube e^2, the bolt being omitted. Fig. 4 is a cross-sectional view of a modified joint.

The same letters of reference indicate the same parts in the several figures of the drawings.

Referring to Figs. 1, 2, and 3 of the drawings, the letter a indicates the top lug of the frame, and b the top horizontal tube of the same, detachably fixed in the lug a. The opposite sides of that portion of the tube b situated in the lug a are slit. In the slit end of the tube b is a short tube or liner e, slit longitudinally at opposite sides nearly from end to end. Each semitubular part of the slit liner e has crossing it transversely a half-tube e^2 e^2, the ends of the half-tubes e^2 e^2 opening on opposite sides of the slit liner e, the opposite open ends registering with holes formed in the side of the slit tube b and lug a. A tapered bolt c is passed transversely through the lug a, split tube b, and longitudinally through the divided cross-tube e^2 of the liner e, the said bolt being prevented from turning by laterally-projecting ribs or webs c^2 c^2, formed on the larger end of the bolt c and engaging corresponding slots formed in the lug or socket a. The smaller end of the bolt c is threaded, as most clearly shown in Fig. 2, and over said threaded end is screwed a nut d. By screwing up the nut d the tapered bolt c is drawn through the divided cross-tube e^2 e^2 and separates or spreads apart the semicylindrical half-tubes e^2 e^2, thus expanding the slit liner e and slit end of the tube b within the lug or socket a and firmly binding said tube b in the lug or socket a.

Where the tube b is of steel and of gage or thickness to render the use of a liner unnecessary, the divided cross-tube e^2 e^2 is fixed directly in the end of the tube b, as is represented in Fig. 4.

If desired, greater security may be obtained by making the lug a slightly conical internally, the interior of the said lug being made larger at its inner end than at its outer end. It will be understood that on the ex-

pansion of the liner *e*, Figs. 1, 2, and 3, or separation of the blocks *e e* the slit end of the tube *b* takes the conical form of the interior of the lug *a*.

The application of our invention to the fixing of other parts of cycle and like frames in their lugs and to the fixing together of the tubular parts of handle-bars, seat-pillars, and other tubular parts of velocipedes and like vehicles differs in no essential respect from its application to the fixing of the top horizontal tube of a safety-bicycle in the top lug, as hereinbefore described.

Further, we wish it to be understood that our improvements are applicable to the fixing of tubes and other parts in their lugs or sockets, which tubes and other parts have a form in cross-section other than circular.

Having described our invention, what we claim is—

1. In a bicycle-frame joint, the combination with a tubular lug *a*, of a frame-tube *b* provided with a longitudinally-slit end arranged in said lug, a slit liner *e* within the end of the tube *b* a divided cross-tube e^2 e^2 fixed transversely in the slit liner, a tapered bolt passed through opposite and coincident holes in the lug and slit frame-tube and through the divided cross-tube of the liner and a nut for drawing up said bolt, substantially as described.

2. In a bicycle-frame joint, the combination with a tubular lug *a* of a frame-tube *b* provided with a longitudinally-slit end arranged in said lug, a divided cross-tube disposed transversely in said frame-tube, a tapered bolt passed through opposite and coincident holes in the lug and slit frame-tube and through the divided cross-tube, and a nut for drawing up said bolt, substantially as described.

3. In a bicycle-frame joint, the combination with a tubular lug *a*, of a frame-tube *b* provided with a longitudinally-slit end arranged in said lug, a slit liner *e* within said slit end of frame-tube, a cross-tube fixed transversely in said liner and divided longitudinally into two semicylindrical half-tubes e^2, e^2 the slits in the frame-tube *b*, liner *e* and cross-tube e^2 lying in the same plane the said divided cross-tube being tapered as shown, a tapered bolt passed through opposite and coincident holes in the lug and frame-tube and liner and through the divided cross-tube and a nut for drawing up said bolt substantially as described.

4. In a bicycle-frame joint, the combination with a tubular lug *a*, of a frame-tube *b* provided with a longitudinally-slit end arranged in said lug, a cross-tube disposed transversely in said tube and divided longitudinally into two semicylindrical half-tubes e^2, e^2 the slits in the frame-tube and cross-tube lying in the same plane and said divided cross-tube being tapered as shown, a tapered bolt passed through opposite and coincident holes in the lug and frame-tube and through the divided cross-tube and a nut for drawing up said bolt substantially as described.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

HENRY BELCHER.
FREDERICK EASOM.

Witnesses:
WM. WHITTLEY,
W. F. FRIEND.