No. 621,282. Patented Mar. 14, 1899.

J. V. PUGH.

BRAZELESS JOINT FOR FRAMES OF CYCLES.

(Application filed June 2, 1898.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

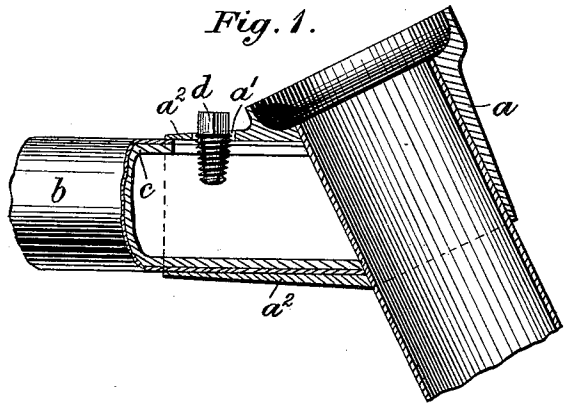


Fig. 2.

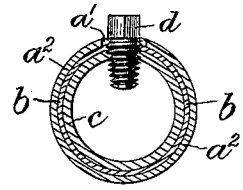


Fig. 3.

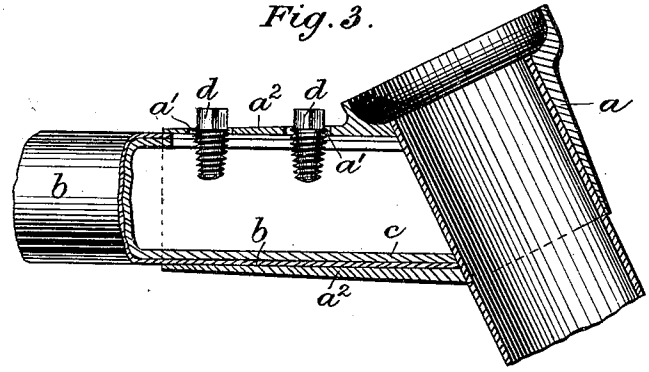


Fig. 4.

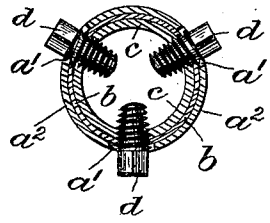
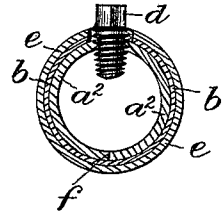


Fig. 6.



Witnesses;-

Geo. Shaw

Arthur John Powell

Inventor;-

John Vernon Pugh

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 621,282. Patented Mar. 14, 1899.

J. V. PUGH.

BRAZELESS JOINT FOR FRAMES OF CYCLES.

(Application filed June 2, 1898.)

(No Model.) 2 Sheets—Sheet 2.

Fig. 5.

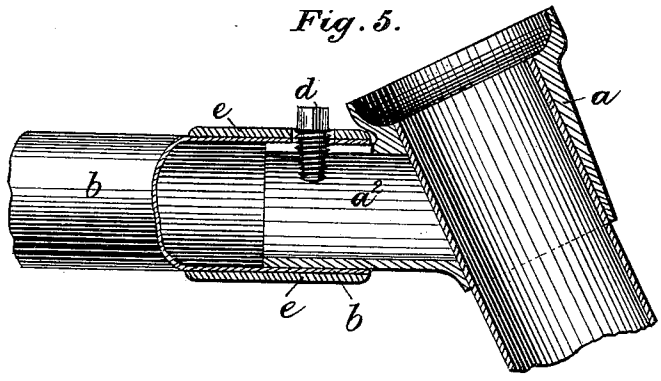


Fig. 7.

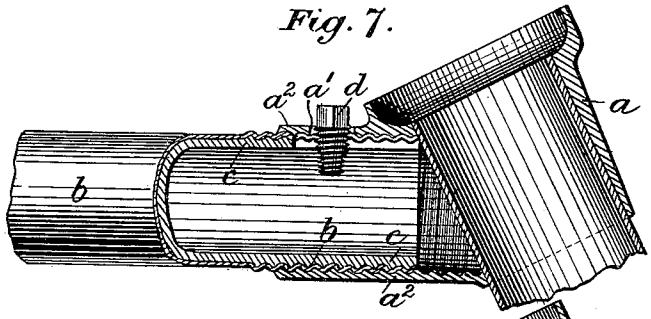


Fig. 8.

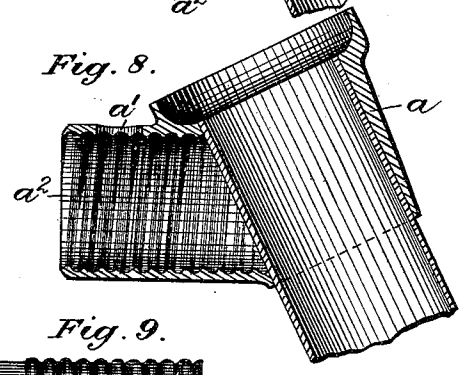
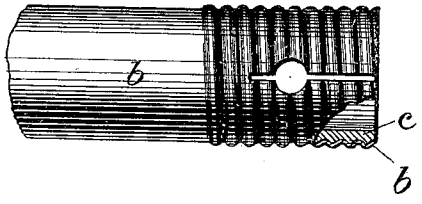


Fig. 9.



Witnesses:—
Geo. Shaw
Arthur John Powell

Inventor:—
John Vernon Pugh

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOHN VERNON PUGH, OF LEEK WOOTTON, ENGLAND.

BRAZELESS JOINT FOR FRAMES OF CYCLES.

SPECIFICATION forming part of Letters Patent No. 621,282, dated March 14, 1899.

Application filed June 2, 1898. Serial No. 682,376. (No model.)

To all whom it may concern:

Be it known that I, JOHN VERNON PUGH, a subject of the Queen of Great Britain, residing at Leek Wootton, near Kenilworth, England, have invented new and useful Improvements in Brazeless Joints for the Frames of Cycles, of which the following is a specification.

My invention consists of the arrangement or combination of the parts hereinafter described of brazeless joints for the frames of cycles, whereby the construction of the said joints is simplified and time and labor saved in the building or putting together and taking apart of the tubes of the said frame.

I will describe my invention in connection with the accompanying drawings, of which—

Figure 1 is a vertical section of a portion of the front tube and top lug of a safety-bicycle frame, showing the connection of the top horizontal tube in the said top lug by the use of a brazeless joint constructed according to my invention. Fig. 2 is a cross-section of the same. Fig. 3 represents in vertical section a similar arrangement, in which two expanding screw-pins in line are employed. Fig. 4 represents in cross-section an arrangement in which three radial expanding screw-pins in the same vertical plane are employed. Fig. 5 represents a modification of my invention in which the tubular part of the lug takes in the tube to be connected to the lug. Fig. 6 is a cross-section illustrating the application of my invention to an arrangement in which sheet-metal lugs are employed, and Figs. 7, 8, and 9 represent a modification in which the tube is screwed into the lug and is retained therein by the expanding screw-pins.

In the several figures of the drawings, a is the lug, and a^2 the tubular part of the same, to which the top horizontal tube b is to be attached. In the arrangement Figs. 1 and 2 the tubular part a^2 of the lug a has a hole a', and the tube b and its liner c, where a strengthening-liner is employed in the end of the tube, have a taper-screwed hole and a longitudinal slit, (similar to that seen in Fig. 9,) the slit extending through the said taper-screwed hole, which latter, when the tube b is inserted in the tubular part a^2 of the lug, is made to coincide with the somewhat larger plain hole a' in the lug. Through the hole a' a short taper screw-pin d is passed and screwed into the taper-screwed hole in the tube b and its liner c, by the action of which taper screw-pin d the slit in the tube and its liner is opened, thereby causing the expansion of the tube b in the tubular part a^2 of the lug a and the firm attachment of the parts together.

The essential features of the invention are its simplicity and the facility with which the connection of the tube and lug can be effected, the short taper screw-pin being readily introduced and screwed home by the thumb and finger, when by a further turn or two by the aid of a key or spanner the parts are secured together.

Where thought necessary or desirable, two or more short taper screw-pins d d in line may be employed.

In Fig. 3 I have represented an arrangement in which two taper screw-pins d d are employed; or two or more longitudinal slits may be made in the tube and its liner, short taper screw-pins being employed for opening each slit.

In Fig. 4 I have represented an arrangement in which three equidistant slits are made in the tube b and its liner c, the said slits passing through equidistant screwed holes in the said tube and its liner. The tubular part a^2 of the lug has three equidistant plain holes of a somewhat larger diameter than the screwed holes in the tube b and liner c. On the introduction of the tube b into the part a^2 of the lug a the screwed holes in the one are made to coincide with the somewhat larger plain holes in the other. The short taper screw-pins d d d are inserted in the screwed holes of the tube and screwed home with such force as to effect the expansion of the slit end of the tube and the consequent firm attachment of the parts together.

Where the frame-tube b takes on the tubular part a^2 of the lug a, as in Fig. 5, the lug has the taper-screwed hole and slit, the tube b having the larger plain hole and being unslit. By the screwing home of the short taper screw-pin d the longitudinally-slit tubular part a^2 of the lug a is expanded within the tube b.

As tubing commonly employed in the construction of cycle-frames is so thin that there

would be danger of the slitting of the tube on the expansion of the slit tubular part a^2 of the lug therein, I prefer, as illustrated in Fig. 5, to provide the thin tube b with a strengthening collar or sleeve e, which supports the tube b against the action of the expanded slit lug a^2.

Where sheet-metal lugs are employed, as in Fig. 6, I pass the tube b onto the outside of the tubular part a^2 of the sheet-metal lug, the bottom meeting edges f of the two semi-tubular halves of the part a^2 of the sheet-metal lug abutting against each other. The top meeting edges have in them the screwed hole into which the short taper screw-pin d is inserted for separating the said top meeting edges, and thereby expanding the tubular part a^2 of the sheet-metal lug within the frame-tube b.

For greater security the frame-tube b may be screwed on or in the lug and be further secured by the arrangement hereinbefore described. This arrangement of my invention is illustrated in section in Fig. 7 and the parts detached in Figs. 8 and 9.

I make by a rolling operation on the thin frame-tube b a screw-thread, and I make in the tubular part a^2 of the lug and on the liner c corresponding screw-threads. The liner c is introduced into the tube b and the radial taper-screwed hole and afterward the slit passing through the same are made in the tube and liner. The lined tube b is screwed into the lug a^2 to the required distance, when the parts are further secured by the expansion of the tube b in the lug a^2 by the short taper screw-pin d in the manner hereinbefore described with respect to plain tubes and lugs.

The application of my invention to the joints of velocipede-frames other than the top lug-joint differs in no essential respect from its application to the said top lug-joint as hereinbefore described and illustrated.

The apertures a' in the outer tube being somewhat larger than the tapered and threaded pins d, which enter said apertures, it is possible to turn these pins into the conical screw-threaded openings in the part to be expanded to any distance that may be found necessary. Thus a maximum expansion of the inner part is always obtainable without regard to the slight variations in diameter which may occur. Moreover, as the pins d engage with only one of the two parts united the liability of their being loosened and displaced by the wear and tear of the structure and the strains to which it is subjected is very largely reduced.

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

1. An unbrazed joint for the frames of cycles, consisting of two tubes, one within the other, the inner tube being provided with one or more screw-threaded, tapered openings and a longitudinal slit passing centrally through and extending on both sides of the same, and a tapered, screw-threaded pin passing through an aperture in the outer tube of somewhat greater diameter than said pin and screwed into each tapered and threaded opening in the inner tube, whereby the latter is expanded against the outer tube, substantially as described.

2. An unbrazed joint for the frames of cycles, consisting of two tubes having a male and female thread respectively, the tube having the male thread being provided with one or more tapering, screw-threaded openings formed radially, and a longitudinal slit passing centrally through the threaded opening and beyond the latter, and a tapered, screw-threaded pin passing through a plain opening in the outer tube which coincides with the threaded tapered opening, said pin being screwed into the threaded, tapered opening to spread the slitted portion of the inner tube and thereby expand the same so that the male threads are forced into the female threads and a perfect fit and rigid union of the parts is secured, substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

JOHN VERNON PUGH.

Witnesses:

GEORGE SHAW,

ARTHUR JOHN POWELL.