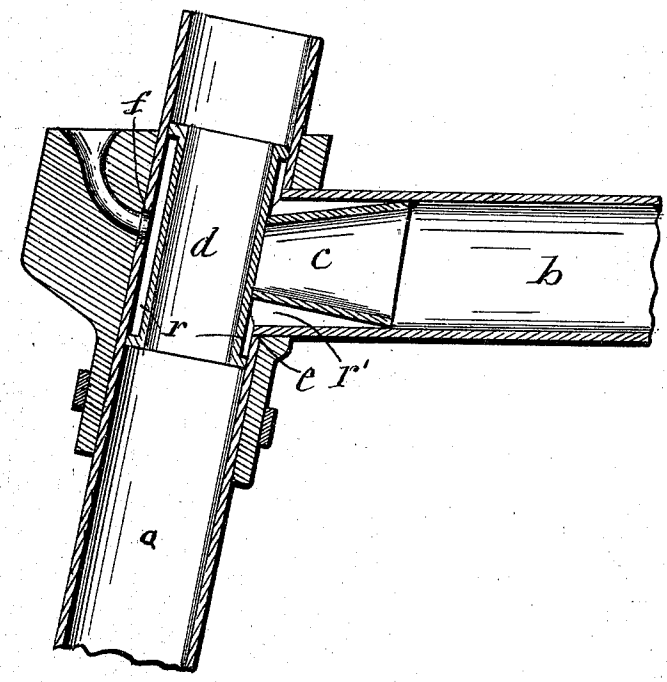
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E. D. CLARK.

METHOD OF UNITING TUBULAR METALLIC FRAMES.

(Application filed Sept. 27, 1900.)

(No Model.)



WITNESSES:
H. B. Smith.
J. J. Laase

INVENTOR
Erving D. Clark
By E. Laase
ATTORNEY

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

UNITED STATES PATENT OFFICE.

ERVING D. CLARK, OF SYRACUSE, NEW YORK.

METHOD OF UNITING TUBULAR METALLIC FRAMES.

SPECIFICATION forming part of Letters Patent No. 681,195, dated August 27, 1901.

Application filed September 27, 1900. Serial No. 31,227. (No model.)

To all whom it may concern:

Be it known that I, ERVING D. CLARK, a citizen of the United States, and a resident of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Tubular Metallic Frames, of which the following, taken in connection with the accompanying drawing is a full, clear, and exact description.

This invention relates to the construction of tubular metallic frames, especially of bicycles and other articles having their members united at an angle to each other.

The object of the invention is to unite said members more permanently and at the same time in a neater and less expensive manner; and the invention consists in the novel method of uniting the tubular frame members, as hereinafter described.

The accompanying drawing represents a vertical longitudinal section of metallic tubes united in accordance with my invention.

a and *b* designate the portions of two steel tubes or tubular frame members to be permanently united at an angle to each other. When said members are to be united by a flush joint, as represented in the drawing, I form a core *d*, preferably of a piece of steel tubing of smaller diameter externally than the interior of the frame member and flanged outward on its ends to enlarge thereat the diameter of said core equal to the internal diameter of the frame member. This core I insert into the frame member or tube *a* to a position to place the flanges of the core above and below the point of attachment of the member *b*, and when thus placed the main portion of the core forms around the inner wall of the tube *a* a cavity *r*, extending lengthwise of said tube and terminated by the end flanges of the core. At the aforesaid point of the attachment of the member *b* I cut in the side of the tube *a* an aperture *e* of the same diameter as the exterior of the member *b*, which I insert in said aperture. Before inserting said member, as aforesaid, I introduce into the attaching end thereof a core *c*, the inner end of which is fitted tightly to the interior of the member *b*, and the outer end of said core is of less diameter and protrudes from the end of the member *b*. I then apply suitable flux to the end of the member *b* and to the core *c* and insert said member, with its core, into the aperture *e* and abut the protruding end of the core against the recessed side of the core *d*. I then cut a small orifice *f* in the opposite side of the member *a* or at some other suitable point to cause said orifice to communicate with the cavity *r* and adjacent cavity *r'* around the core. Said recess and space constitute mold-cavities for the reception of molten metal specially prepared by me to impart to it the quality of effectually amalgamating with steel tubing. This metal flowing freely into the cavities *r* and *r'* and becoming firmly set therein, as shown at *t*, forms a permanent and perfect union of the two members *a* and *b*. The entire end of the member *b* being in direct and intimate contact with the edges of the orifice *e* prevents the aforesaid molten metal from escaping through the joint of the two members.

When it is desired to unite the members *a* and *b* by an outside connection, as represented in the drawing, the aforesaid core may be dispensed with and, if desired, a metal disk *o* may be inserted into the attaching end of the member *b* to brace the same. Said end of the member *b* is inserted into the aperture *i* in the side of the member *a* and fitted tightly to said aperture to prevent the molten uniting metal from escaping through the joint to the interior of the members. I then apply flux to the exterior of the members at the junction thereof and place them in a suitable mold D, having a cavity D' shaped to receive the jointed portions of the two members *a* and *b*, with proper space *h'* around them for forming a cast-metal band embracing said members. After the joined members are placed in said mold I introduce through the gate *l* the molten metal hereinbefore mentioned, said metal filling the space *h'* and forming the band *h*, which permanently unites the members *a* and *b*. My said metal is of a character which allows said metal to permanently unite with cold steel, and I therefore obviate the necessity of heating and impairing the integrity of the members *a* and *b* preparatory to uniting them by said metal. Furthermore, by my described invention I unite the

frame members by very strong metal linings or bands completely encircling said members at their junction, in contradistinction to the usual method of brazing said members, which become thereby excessively heated and usually defaced by the spreading of the brazing over the surfaces of the frame members, which incurs the extra expense of subsequently cleaning said members.

What I claim as my invention is—

The method of uniting metal tubes at an angle to each other by cutting in the side of one tube an aperture of the same diameter as the other tube, forming a core with a circumferential mold-cavity between its ends and inserting said core into the first tube, then inserting into the end of the other tube a core fitted with its inner end tightly to the tube and having its outer end protruding and of less diameter, then applying flux to said ends of the tube and core protruding therefrom and inserting said ends into the aforesaid aperture and abutting the end of the core against the recessed side of the other core, then cutting in the side of the first tube an orifice communicating with the mold-cavity in the inclosed core and then casting through said orifice molten metal as set forth.

ERVING D. CLARK.

Witnesses:
J. J. LAASS,
F. L. KENT.