No. 656,765. Patented Aug. 28, 1900.

J. S. COPELAND.

MECHANICAL JOINT FOR VEHICLE FRAMES.

(Application filed Oct. 4, 1897.)

(No Model.)

Fig. 1

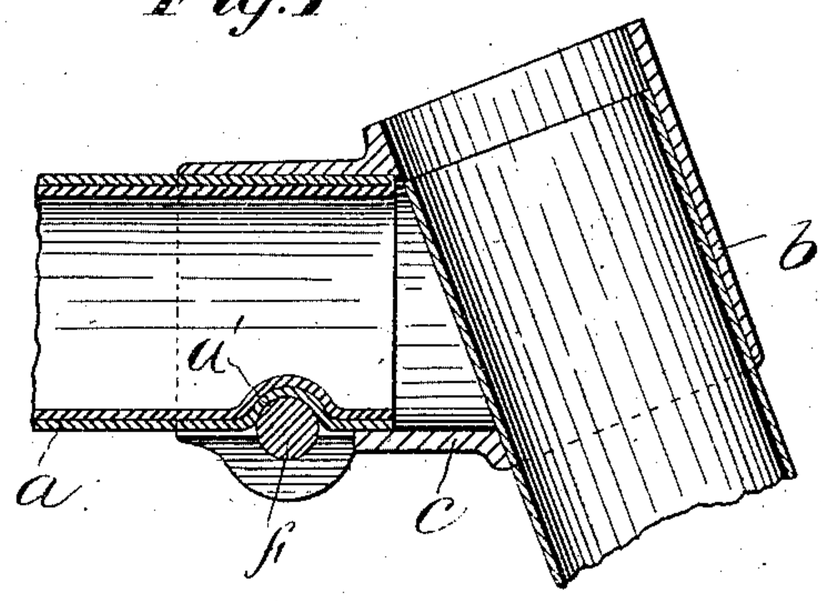
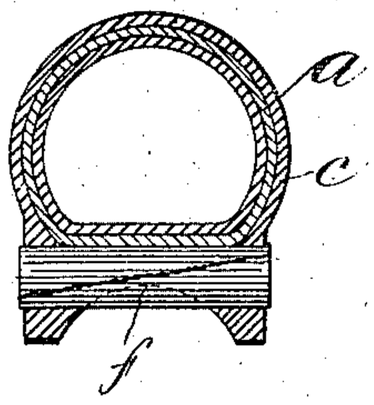


Fig. 3

Fig. 2



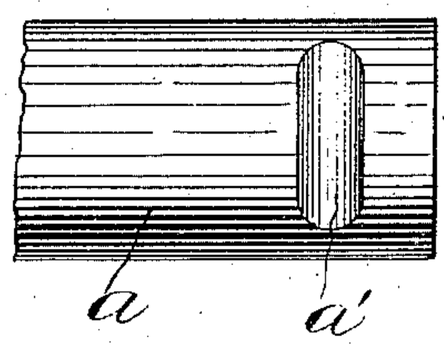
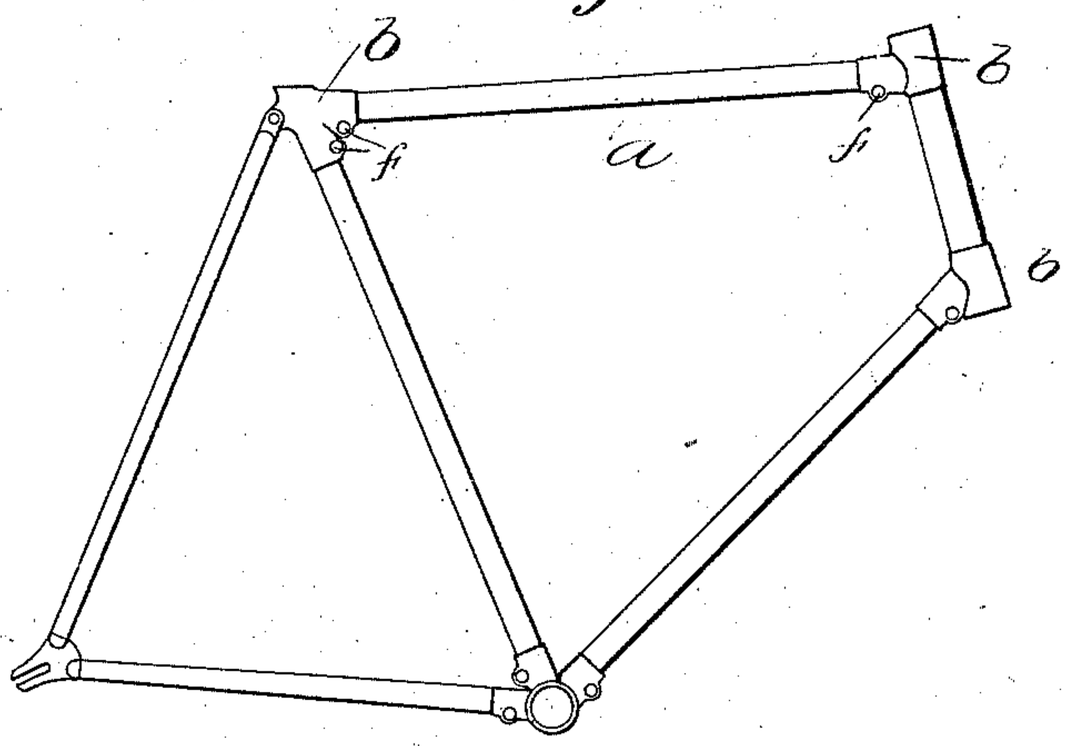


Fig. 4



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UNITED STATES PATENT OFFICE.

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MECHANICAL JOINT FOR VEHICLE-FRAMES.

SPECIFICATION forming part of Letters Patent No. 656,765, dated August 28, 1900.

Application filed October 4, 1897. Serial No. 654,015. (No model.)

To all whom it may concern:

Be it known that I, JAMES S. COPELAND, a citizen of the United States, and a resident of Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Mechanical Joints for Vehicle-Frames, of which the following is a full, clear, and exact description, whereby any one skilled in the art can make and use the same.

My invention relates generally to frames for vehicles, and more particularly to the class of lighter vehicles, such as velocipedes and bicycles; and the object of my invention is to provide a vehicle-frame made up of separable members, comprising the longer main frame members and shorter connecting bracket members at the angles of the frame, with means for removably fastening such parts together.

Referring to the drawings, Figure 1 is a view in central vertical section through the frame at the junction of the separable members and through the joint. Fig. 2 is a view in cross-section through these parts on the center line of the locking-pin. Fig. 3 is a detail bottom view of the end of one of the main frame members, showing the transverse socket. Fig. 4 is a view in side elevation of a bicycle-frame of the "diamond" type, in the making of which my improvement is embodied.

In the manufacture of frames for velocipedes and such light vehicles it is common in the art to make the longer frame members of tubes, although that is not essential, and these members are united to each other by an intervening bracket member as a rule, although there may be a direct connection between the several separable members without the intervention of a bracket.

In the accompanying drawings the letter *a* denotes a main frame member, and *b* a bracket member, the latter being usually provided with a tang *c*. This tang *c* is provided with a socket into which the end of the main frame member projects and in which it closely fits. The end of the main frame member *a* is provided with a transverse indentation or socket *a'*, so located that when the end of this main frame member is fitted into the socket in the tang this socket *a'* will lie within and be covered by the walls of the tang. Through the walls of the tang is a transverse opening, so arranged that a pin *f* extending through this hole will project into the socket-space in the tang and lie as to part of its width within the transverse socket in the side of the main frame member. These parts are so arranged that the pin-sockets register, and the pin *f* may be so driven through the sockets as to bind the parts firmly together. The tang is preferably of such a thickness as to its walls as to permit the headed end of the pin to be recessed into the surface as to one end of the pin, while the other end may be headed or upset slightly into the recess on the opposite wall of the tang, thus holding the pin firmly in place against accidental removel. If desired, the pin may be headed on one end and provided with a thread on the other to receive a nut, or the pin may be tapered lengthwise, or it may be made in sections lengthwise with tapered adjacent surfaces roughened to a degree sufficient to enable them when driven into the hole from opposite ends to press together and so firmly engage as to prevent any accidental removal of the pin or the working out of the sections under the ordinary wear in use of the vehicle.

The means above described for securing the parts of the frame members together holds them from longitudinal as well as rotary movement with respect to each other; but an added security against the lengthwise movement of the parts may be obtained by threading the inner wall of the socket in the tang and providing the end of the frame member with a thread to engage the threaded socket and screwing the parts together before the transverse pin is driven through to finally bind the parts in place. These means of uniting the several members of a vertical frame afford a simple and secure device for avoiding the prior method of uniting the frame parts, which includes a brazing operation. This latter is objectionable, as it subjects the frame parts when the main

parts are tubular with thin walls, as is the rule in the manufacture of bicycles, to such a degree of heat in the operation of brazing as to weaken the parts, and by unequal cooling subject them to unequal and unknown strains. There is also the added danger of cutting into the surface of the tube or making a breaking scratch in filing away the surplus metal used in bracing. All such dangers are avoided by the use of my improvement.

I claim as my invention—

1. In combination in a vehicle-frame having separable members, a main frame member having near its end a transverse socket, a bracket member having a tang with a transverse socket, and a removable pin in the transverse sockets of the main-frame member and the bracket member comprising two separable sections adapted to be inserted from opposite sides of the transverse opening whereby the said members are separably secured together, all substantially as described.

2. In combination in a vehicle-frame having separable members, a bracket member having a hollow tang with a transverse pin-socket, a main frame member with its end adapted to fit closely within the hollow tang and having near its end a transverse socket or indentation, and a removable transverse pin fitting within the sockets of the tang and frame parts, said transverse pin composed of two sections provided with oppositely-disposed tapered surfaces, and adapted when inserted in the transverse opening to separably bind together the frame member and the bracket member, all substantially as described.

3. In combination in a vehicle-frame comprising separable members, a bracket member having a tang with a lengthwise socket and a transverse pin-socket, a main frame member with its end adapted to fit closely within the lengthwise socket and provided at or near its end with a transverse socket or indentation, and a locking-pin adapted to be inserted in the transverse opening of the bracket and tube members and comprising two sections each provided with a serrated beveled surface.

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