

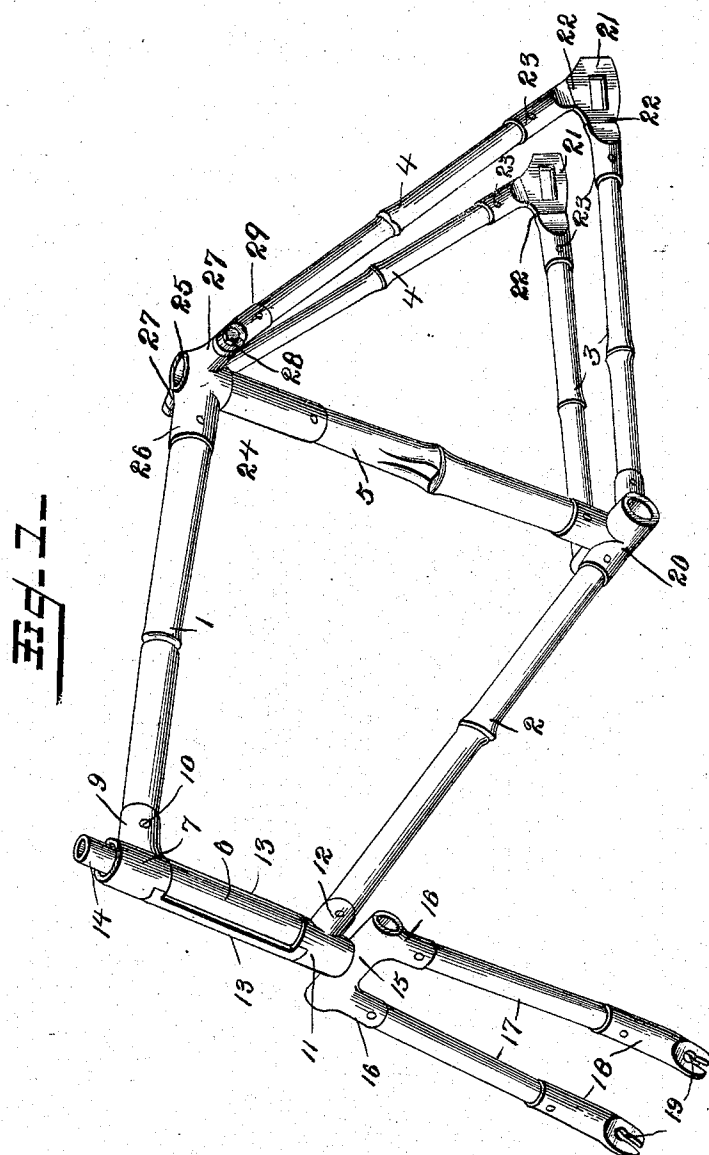
(No Model.)

2 Sheets—Sheet 1.

A. J. OBERG & A. W. GUSTAFSON.
BICYCLE FRAME.

No. 565,783.

Patented Aug. 11, 1896.



Witnesses

W. J. North.
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Inventors

August J. Oberg and
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Fig. 6.

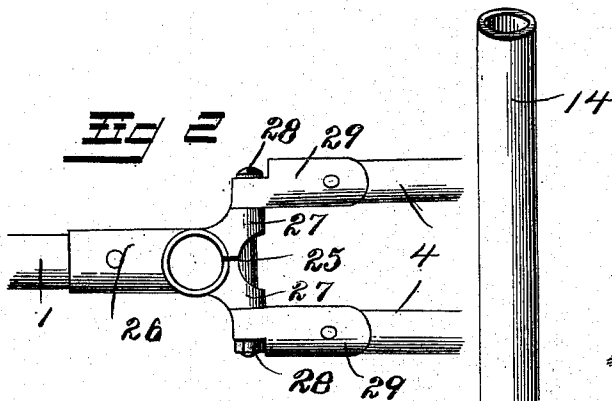


Fig. 3.

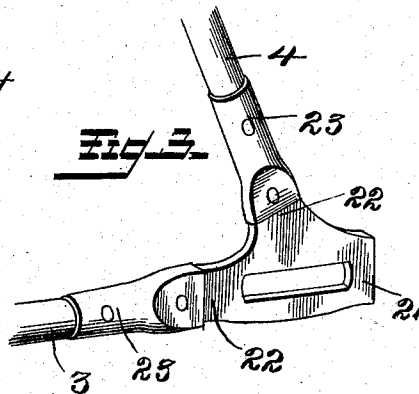


Fig. 4.

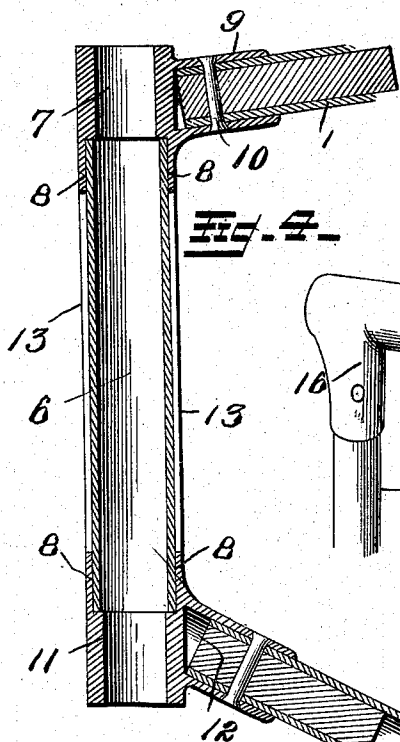
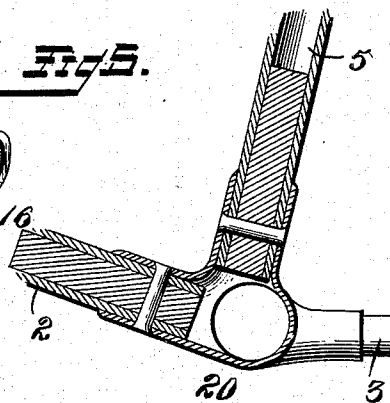


Fig. 5.



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UNITED STATES PATENT OFFICE.

AUGUST J. OBERG AND ANDREW W. GUSTAFSON, OF WATERLOO, NEBRASKA,
ASSIGNORS OF ONE-THIRD TO J. A. CUMMINGS, OF SAME PLACE.

BICYCLE-FRAME.

SPECIFICATION forming part of Letters Patent No. 565,783, dated August 11, 1896.

Application filed June 15, 1895. Serial No. 552,939. (No model.)

To all whom it may concern:

Be it known that we, AUGUST J. OBERG and ANDREW W. GUSTAFSON, citizens of the United States, residing at Waterloo, in the county of Douglas and State of Nebraska, have invented a new and useful Bicycle-Frame, of which the following is a specification.

This invention relates to an improvement in bicycle-frames, and has for its object to provide a frame of the character referred to which may be manufactured at very slight cost, which shall possess strength and durability in a very high degree, and which shall combine therewith the very important characteristic of lightness.

The primary object of the invention is to utilize bamboo in the construction of the frame-bars and fork members and to construct the various couplings, bearings, and thimbles in such manner as will adapt them to receive and properly connect frame-bars of such a character.

Other objects and advantages of the invention will appear in the course of the subjoined description.

In order to accomplish the objects above referred to, the invention consists in certain novel features and details of construction and arrangement of parts whereby certain advantages in point of cheapness, strength, and durability are attained, as hereinafter fully set forth, illustrated in the drawings, and finally embodied in the claim.

In the accompanying drawings, Figure 1 is a perspective view of a bicycle-frame constructed in accordance with the present invention. Fig. 2 is an enlarged detail plan view of the seat-post socket, showing the manner of coupling the rear inclined braces thereto and the manner of clamping the seat-post. Fig. 3 is an enlarged detail perspective view of one of the rear coupling-plates forming the junction of the rear inclined braces and horizontal frame-bars. Fig. 4 is a vertical longitudinal section taken through the head of the machine. Fig. 5 is an enlarged detail section through the crank-shaft coupling, showing the manner of securing the ends of the bamboo frame-bars within the integrally-formed thimbles thereof. Fig. 6 is a

detail perspective view of the front-fork crown, the tubular steering-post formed integrally therewith, and portions of the fork members or arms secured thereto.

Similar numerals of reference designate corresponding parts in the several figures of the drawings.

This invention contemplates the use of bamboo in lieu of the ordinary steel tubing employed in the construction of bicycle-frames; and the invention consists in the peculiar formation of the several couplings, bearings, &c., and the manner of uniting the ends of the bamboo rods to said couplings and bearings whereby the use of bamboo in the construction of bicycle-frames is rendered practicable. It is well known that bamboo possesses strength and durability in a very high degree and that it is used in many countries in the construction of houses, in the manufacture of furniture, and for various other purposes where strength and durability are important factors. In addition to this, bamboo has a very low specific gravity and is exceedingly cheap, points which will recommend the use of this material to manufacturers in this line.

Referring to the accompanying drawings, the bicycle-frame therein illustrated is in the form of what is known as the "diamond" frame, comprising an upper main horizontal bar 1, the lower main brace or reach 2, the rearwardly-projecting horizontal bars, forming the rear fork and indicated at 3, the rear inclined braces 4, and the centrally-arranged and substantially vertical bar 5, crossing the diamond between the crank-shaft bearing and the saddle-post socket. All the bars enumerated, as well as the head 6, to which the forward ends of the main horizontal bar 1 and reach 2 are connected, are made from different sections of bamboo, said sections varying in size and length as the strength and proportions of the complete frame may require. These several sections or bars of bamboo are united or jointed together at their adjacent ends by means of metallic couplings, which will now be severally described.

7 designates the coupling which connects the upper end of the head with the forward end of the upper horizontal bar 1, and said

coupling comprises a main vertically-disposed tubular sleeve or body, which is formed in its lower end with an internal annular recess 8, adapted to receive the upper extremity of the tubular head 6 of bamboo. Said coupling also comprises a rearwardly-extending thimble 9, into which is fitted the adjacent end of the upper horizontal bar 1. In order to form a thoroughly effective and durable joint between the end of the bar 1 and the thimble 9, the end of the bar, which it will be remembered is composed of bamboo, is plugged with a piece of hard wood or any desired material, and the exterior surface of the extremity of said bar 1 is dressed down and, if desired, rounded off and slightly tapered and driven firmly into said thimble, after which a metal rivet 10 is passed through the thimble and also through the end of the bar 1 and the plug therein for holding said bar in place and effectively preventing its escape. The coupling 11 at the base of the head is formed similarly to the coupling 7, the rearwardly-extending thimble 12 thereof being disposed at a slightly-different angle to correspond to the angle at which the lower main brace or reach 2 joins the head of the machine. The lower main brace or reach is united to said coupling and secured within the thimble 12 the same as the upper horizontal bar 1 is secured in place, and the coupling 11 is internally recessed in its upper end to receive the lower extremity of the tubular bamboo head 6. The couplings 7 and 11 are connected by means of a pair of metallic straps 13, disposed, preferably, in front and rear of the head and brazed or otherwise secured at their opposite extremities to said couplings. By means of this construction said couplings are effectively prevented from moving apart and are held tightly and securely upon the ends of the bamboo head. This construction also affords a metal bearing at each end of the head, within which may be arranged the tubular steering-post 14 of the front fork. The tubular steering-post has brazed or otherwise secured to its lower end a transverse tubular head, which constitutes the crown of the front fork, and this crown (indicated at 15) is provided with an oppositely-disposed pair of downwardly-projecting thimbles 16, which receive the upper extremities of the fork members or arms 17, which are of bamboo and have their ends plugged and fitting snugly within and riveted in place, as in the case of the bars 1 and 2, above described. The lower extremities of these fork members or arms are also plugged and driven into a pair of metal ferrules 18, said ferrules being riveted thereon by means of through-rivets and having their lower ends mashed or compressed and formed with open slots or notches 19, adapted to receive the axle of the front wheel in a manner that will be readily understood by those familiar with the art to which this invention appertains.

20 designates the crank-shaft bearing and

lower coupling combined. This coupling comprises a horizontally-disposed tubular sleeve, which forms the bearing box or casing in which the crank-axle fits, and has formed integrally therewith or brazed thereto a series of tubular thimbles, one of which inclines upwardly and extends forwardly to receive the plugged rear end of the lower main brace or reach 2, which is secured therein by a through-rivet. Another thimble projects upwardly from said coupling and receives the lower plugged end of the central vertical bar 5, which is also secured by means of a through rivet, and said coupling further comprises a rearwardly-projecting pair of thimbles of relatively smaller diameter, which receive the forward plugged ends of the horizontal bars 3 of the rear fork, the ends of said bars also being secured by through-rivets.

21 designates a pair of slotted metal plates which partly constitute the couplings at the rear corners of the diamond frame. The slots in said plates are disposed longitudinally of the machine and adapted to receive the rear driving-wheel axle and to provide for the adjustment of the same with a view to taking up the slack in the driving-chain in a manner well understood. Each of said plates is formed with a pair of diverging arms or projecting portions 22, one of which is disposed horizontally and the other upwardly and forwardly and at an acute angle with the lower arm or projection.

23 designates a pair of tubular thimbles, which consist of short sections of tubing compressed or mashed inward at one end to embrace the arms or projections 22 of the slotted plate, said thimbles being riveted in place upon said arms or projections or brazed or otherwise secured thereto in any preferred manner. The horizontal forwardly-extending thimbles 23 of said plates receive the rear plugged ends of the horizontal frame-bars 3, which are secured by through-rivets, while the upwardly and forwardly extending inclined thimbles receive the lower rear ends of the inclined frame bars or braces 4, said ends being plugged and secured by means of through-rivets.

24 designates the remaining coupling, which comprises the seat-post socket, said coupling being formed with a depending sleeve or thimble of considerable length, into the lower end of which is fitted the upper extremity of the centrally-arranged bar 5, the connection being made by means of the usual through-rivet. By reason of the extent of this depending sleeve or thimble the latter is adapted to receive the seat-post, and provision is thereby made for the required vertical adjustment of said seat-post. This sleeve is split, as indicated at 25, from its upper edge downwardly a sufficient distance to enable its upper end to be contracted in diameter for clamping the seat-post therein.

26 indicates a forwardly-projecting thimble on said coupling, which receives the rear

plugged end of the upper horizontal bar 1, the same being secured by means of a through-rivet.

27 designates a pair of lugs which extend rearwardly from the coupling 24 upon either side of the split 25 and are perforated to receive a transverse clamping-bolt 28.

29 represents a pair of ferrules which receive the upper ends of the inclined rear braces 4, being secured thereto by means of through-rivets, and said ferrules are formed with forwardly-projecting perforated ends which abut against the lugs 27 upon opposite sides and receive the same transverse bolt 28 which passes through the ears or lugs 27. By means of this construction the single bolt 28 serves the double purpose of connecting the rear inclined braces 4 with the seat-post socket and of contracting the upper end of said socket for clamping and holding the seat-post at the desired elevation.

In the manner above described, and by reason of the particular construction of the several couplings described, it is possible to utilize bamboo in the construction and manufacture of bicycle-frames.

It will be apparent that changes in the form, proportion, and minor details of construction

may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is—

In a bicycle-frame, the combination with a bamboo head-tube, of sleeves arranged at the top and bottom thereof and open at both ends and also formed in their adjacent ends with annular rabbets in which the ends of the head-tube are inserted, and metal stays arranged exteriorly and extending longitudinally of the head-tube and united permanently at their extremities to said sleeves, the said stays being located upon opposite sides of the head-tube, whereby the latter is confined between said sleeves and a through-bore left for the fork-stem, substantially as described.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in the presence of two witnesses.

AUGUST J. OBERG.

ANDREW W. GUSTAFSON.

Witnesses:

C. GOODWIN,

C. A. COLVIN.