(No Model.)

F. D. MALTBY.

BICYCLE.

No. 591,673. Patented Oct. 12, 1897.

Fig. 1.

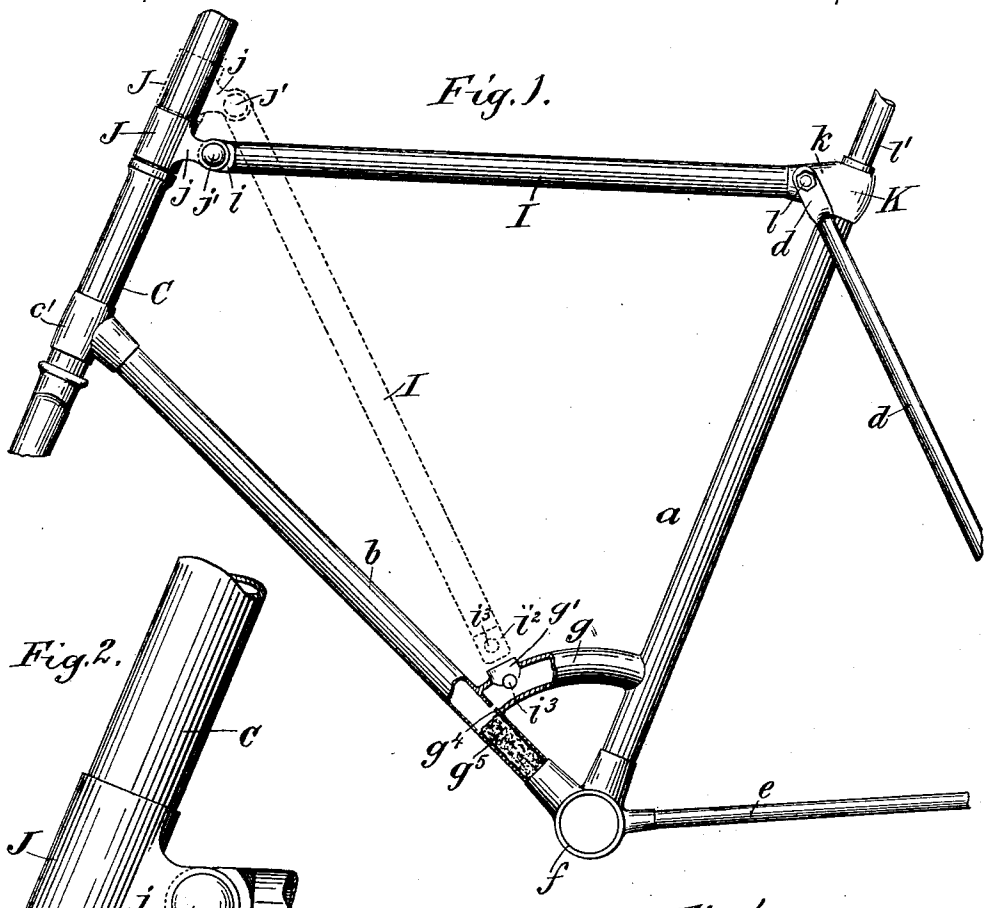


Fig. 2.

Fig. 3

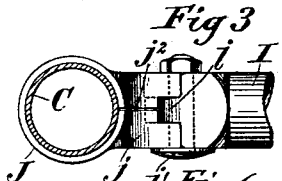


Fig. 4.

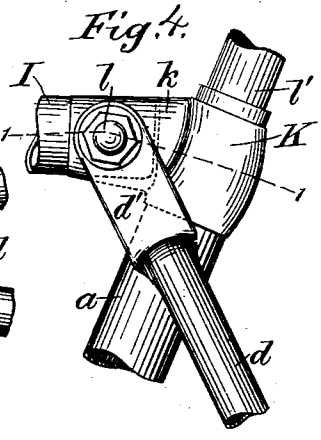


Fig. 5.

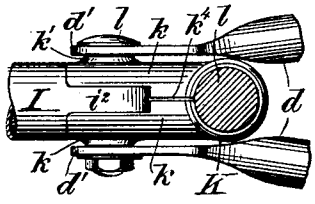


Fig. 6.

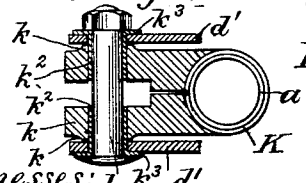


Fig. 7.

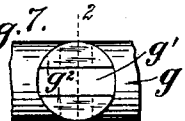


Fig. 8.



Witnesses: l k³ d'
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

FRANK D. MALTBY, OF BROOKLYN, NEW YORK.

BICYCLE.

SPECIFICATION forming part of Letters Patent No. 591,673, dated October 12, 1897.

Application filed December 7, 1895. Serial No. 571,435. (No model.)

To all whom it may concern:

Be it known that I, FRANK D. MALTBY, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Bicycles, of which the following is a full, clear, and exact specification.

The objects of my invention are to construct a bicycle-frame in such a manner that it may be changed from a "diamond" to a "drop" or "loop" frame and to so arrange the said construction as to make the change easy, effectual, and to render both designs of frame as near like the general designs corresponding therewith as possible.

In the accompanying drawings, Figure 1 is a side elevation of my improved cycle-frame, partly broken away, showing two arrangements of the said construction. Fig. 2 is an enlarged broken side elevational view of the improved front post of Fig. 1, with a portion of the connecting top stay-tube and its clamp. Fig. 3 is a top view of Fig. 2. Fig. 4 is a broken side elevational view of a portion of the vertical stay, back stays, and top stay-tube of the frame and the clamp for the latter and for the seat-post, a portion of which latter is shown. Fig. 5 is a top view of Fig. 4. Fig. 6 is a similar view to Fig. 5 in cross-section, which is taken on the line 1 1 of Fig. 4. Fig. 7 is a top view of a mortise-joint formed on the lower part or arch of the frame of Fig. 1. Fig. 8 is a cross-section of Fig. 7, with a cap in position, taken on the line 2 2 of Fig. 7.

Fig. 1 represents a bicycle-frame consisting of the ordinary stay-tubes *a*, *b*, *c*, *d*, and *e*. The tubes *a*, *b*, and *e* are connected in the ordinary manner with the crank-yoke *f*, which is likewise of ordinary construction. The said tube *b* is rigidly and ordinarily connected by means of a forging *c'* to a front post C, though any rigid construction will answer the purpose. An arched (preferably) tubular piece *g* is connected rigidly at its ends with the tubes *a b* a proper distance above the crank-shaft yoke *f*. The arc of this piece *g* preferably conforms to the arc of a circle, having the center of the yoke *f* for a center. Two lugs g^2 project upwardly from and form a part of the said piece *g*, and between the said lugs is formed in the said piece a slot or hole *g'*. From the top the said lugs have, preferably, a rounded shape, as shown in Fig. 7, and a similarly-shaped and preferably hollow cap *h*, having the flange or rim *h'*, is adapted to be fitted over the said lugs and hole to cover the latter when the said lugs have no engagement with the top stay-tube of the machine. From the inside of the said cap projects into the hole *g'* a tenon h^2, and a hole g^3 is formed laterally through the said lugs and the said tenon, through which a bolt is adapted to pass to hold the said cap securely in place to prevent entrance of dirt or grit. A small hole g^4 is formed through the stay-tube *b* at the point of connection with it of the arc *g*, and some felt g^5 or other thick packing is placed in the said tube *b* between the said hole and the crank-shaft yoke *f*, opening being made into the said yoke from the said tube. This device, as will be readily seen, serves as an efficient oiler, allowing the oil injected by way of the hole *g'*, after passing through the hole g^4, to drain slowly through the felt into the space *r* of the yoke *f* (thereby freeing the oil from all grit) until sufficient oil is contained in the said yoke to allow it to flow through holes *q*, formed in the wall of the bearing-cups and onto the balls, as described later on.

The top stay, which forms a novel feature of this invention, is formed of a tube I, having at its forward end a tenon *i*, which fits into a bifurcated projection *j*, forming part of a clamp J, which slidably encircles the front post C, the said projection *j* being split, as at j^2, to form the said bifurcation *j*. A hole passes through these said projections *j* and through the said tenon *i*, and a bolt *j'* is introduced therein and provided with a nut, which when turned up clenches the clamp J tightly and immovably on the post C and binds the tenon *i* of the tube I securely with the arms *j* of the said clamp, thereby rigidly connecting the said stay-tube I with the post C. The aforesaid bolt *j'* hinges the said stay I to the clamp J. The opposite end of the said stay I has a tenon i^2, which is adapted to pass between and to be held by the projections *k k* of a bifurcated portion of a clamp K, which surrounds the vertical post *a*, and is split at k^4 to form the said clamp.

The rear upper stays are each movably or rigidly connected with one of the aforesaid projections *k* by means of a sleeve k^3, passing through a hole in the flattened end *d'* of said stays and into and through a hole formed in

the said projections k, corresponding to one and both of the stay-tubes d. A flange k^3 is preferably formed on each sleeve k^2. Bosses k' are preferably raised on the side of each of the projections k, and a bolt l passes through said sleeves, projections k k, and the tenon i of the stay I and by means of a clamp-nut clamps the said parts firmly together and rigidly holds, likewise, the seat-post l' in the tube a and clamp K.

Though I consider the construction herein set forth the most desirable form, still I do not limit myself to the details of construction as shown, as I am aware of other ways of accomplishing the same. Neither do I confine myself to the general construction shown, as I am aware that modifications can be made under the principle of invention without departure from said principle.

Fig. 1 (the wheels in this machine being similar to those in other machines) represents the style of frame for men and boys' use. By withdrawing the bolt l the end i^2 of the bar I is dropped from its position, when, the bolt j' being loosened, the clamp J is slid upwardly on the post C to the position represented generally by the dotted lines I J. The tenon i^2 is then guided into the mortise g' of the arched piece g. A bolt is inserted in the hole i^2 and drawn tight with its nut. The nut of the bolt j' of the clamp J (which is now in normal position) is then tightened, the said clamp thereby connecting the stay-tube I rigidly with the post C. The bolt l is replaced in the clamp K and its nut tightened, and the said machine is converted into a woman's or girl's machine.

The arc g, besides serving as a catch for the tube I, serves to greatly strengthen the machine-frame and to reduce the vibrations thereof.

On the whole this machine has the advantage over other forms of convertible machines in that in whichever form of machine it assumes the fact of its convertibility is almost totally disguised.

What I claim as my invention, and desire to secure by Letters Patent, is--

1. A bicycle-frame adapted to be converted at will into a "drop-frame" or "diamond" frame and provided with a strut spanning the angle between the lower front reach and the seat-post, a brace-rod connected at one end to the upper portion of the steering-post and means for removably connecting the other end of the brace-rod either to the said strut or to the upper portion of the seat-post, substantially as set forth.

2. A bicycle-frame adapted to be converted at will into a "drop-frame" or a "diamond" frame and provided with a strut spanning the angle between the lower front reach and the seat-post, a brace-rod having a sliding connection at one end with the upper portion of the steering-post, means for removably connecting the other end of the brace-rod either to the strut or to the upper portion of the seat-post and means for securing the said sliding connection in its different adjustments, substantially as set forth.

3. A bicycle-frame adapted to be converted at will into a "drop-frame" or a "diamond" frame and provided with a curved strut spanning the angle between the lower front reach and the seat-post, a brace-rod connected at one end to the upper portion of the steering-post and means for removably connecting the other end of the brace-rod either to the curved strut or to the upper portion of the seat-post, substantially as set forth.

4. In a convertible vehicle-frame having a front post, a seat-support, a crank-hanger, stays connected therewith, and a movable connecting-piece to connect the said front post and the said seat-support, the said connecting-piece being slidable upon said front post, a tenon formed on one end of said connecting-piece, a rigid arched piece or tube forming a portion of the said frame between the said stays adjacent to and above the said crank-hanger, one or more lugs rigidly formed on the said arched piece or tube, the said tenon being adapted to fit against or between the said lugs, and having a hole to register with a hole formed through the said lugs, and a bolt passing through the said hole and having a nut to secure the said connecting-piece, by means of the said tenon and lug or lugs, to the said lower portion of the frame, substantially as set forth.

5. In a convertible vehicle-frame having a front post, a seat-support, a crank-hanger, stays connected therewith, and a movable connecting-piece to connect the said front post and the said seat-support, the said connecting-piece being slidable upon said front post, a tenon formed on one end of said connecting-piece, a rigid arched piece or tube forming a portion of the said frame between the said stays adjacent to and above the said crank-hanger, one or more lugs rigidly formed on the arched piece or tube, the said tenon being adapted to fit against or between the said lugs, and having a hole to register with a hole formed through the lugs of the said arched tube, a hole passing through one of the stay-tubes in connection with said arched tube, a packing substance compressed within the portion of the said stay-tube between the said arched tube and the said crank-hanger, and a cap fitting detachably over said lugs, a hole passing through the said lugs and the said tenon, and a bolt passing through the said hole and having a nut to secure the said connecting-piece, by means of the said tenon and lug or lugs, to the said lower portion of the frame, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 16th day of November, 1895.

FRANK D. MALTBY.

Witnesses:
AUGUSTUS M. PRICE,
S. BISHOP MARKS.