(No Model.)

T. B. JEFFERY.

VELOCIPEDE.

No. 460,641. Patented Oct. 6, 1891.

Fig. 1.

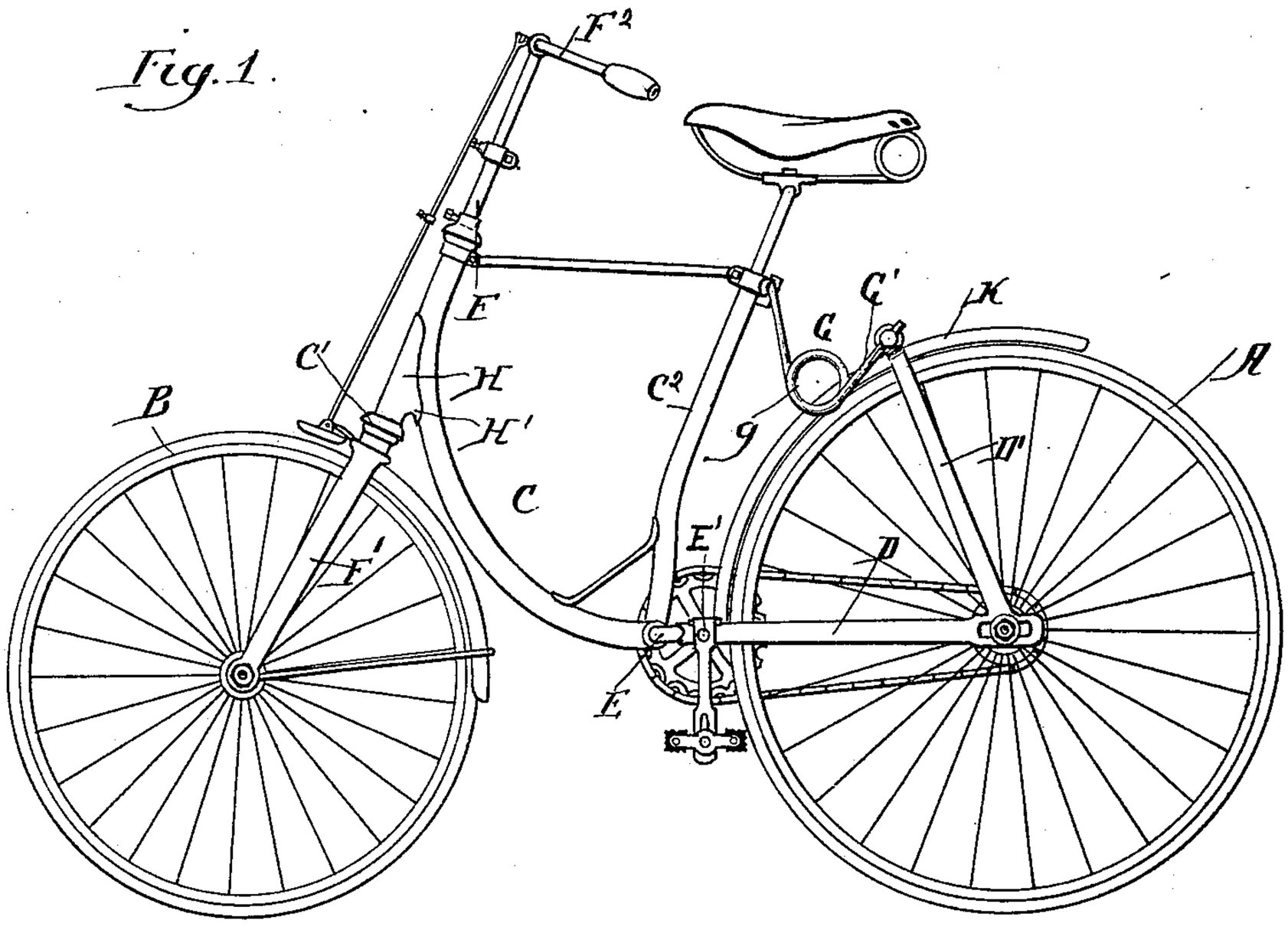


Fig. 2.

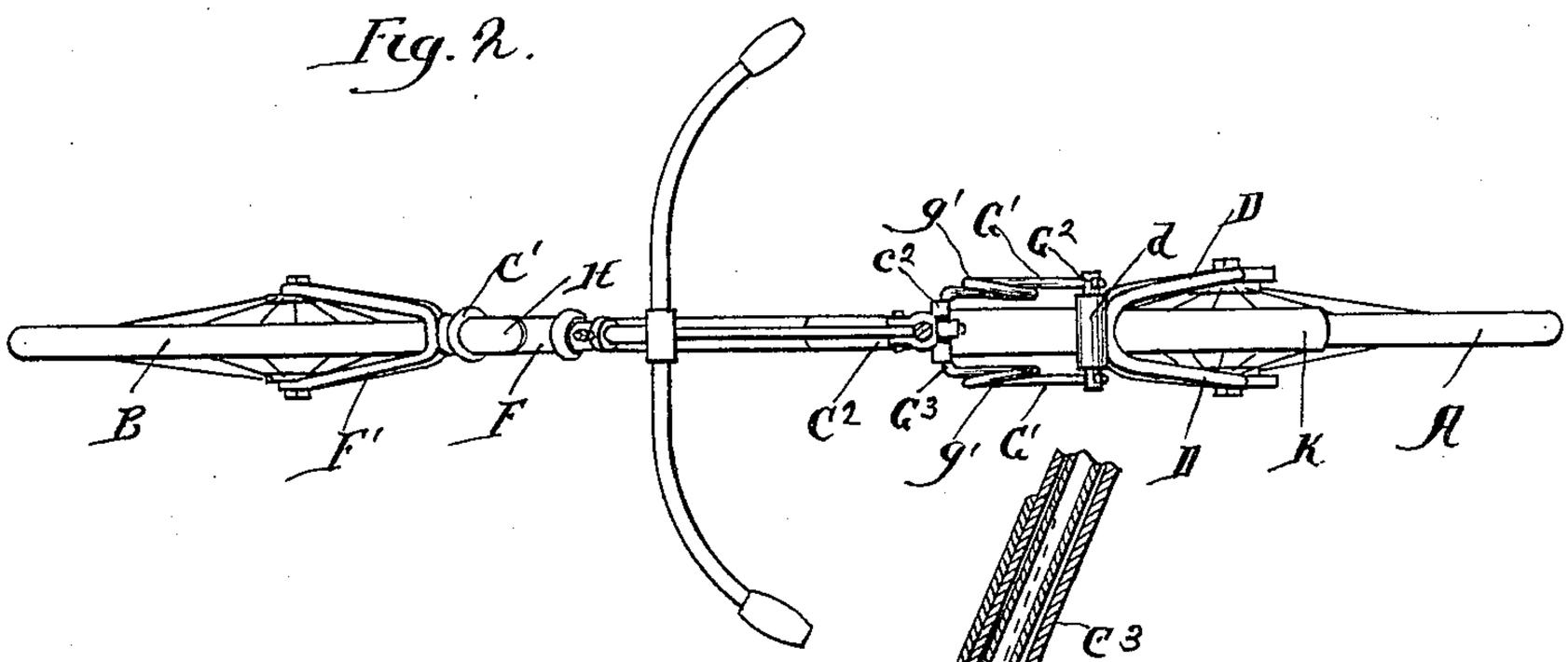
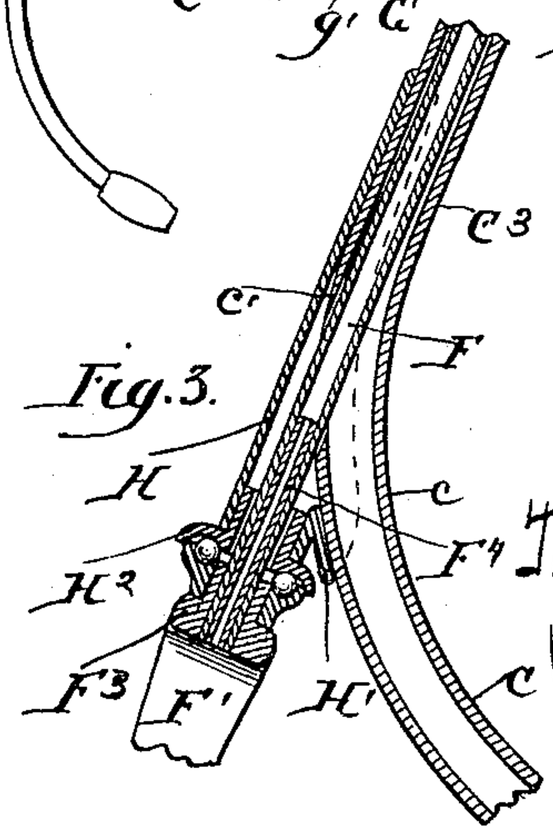


Fig. 3.



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UNITED STATES PATENT OFFICE.

THOMAS B. JEFFERY, OF CHICAGO, ILLINOIS.

VELOCIPEDE.

SPECIFICATION forming part of Letters Patent No. 460,641, dated October 6, 1891.

Application filed January 24, 1891. Serial No. 378,877. (No model.)

To all whom it may concern:

Be it known that I, THOMAS B. JEFFERY, a citizen of the United States, residing at Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Velocipedes, which are fully set forth in the following specification, reference being had to the accompanying drawings, forming a part thereof.

In the drawings, Figure 1 is a side elevation. Fig. 2 is a sectional plan, section being made at the line 2 2 on Fig. 1. Fig. 3 is a section at the line 3 3 on Fig. 2.

One part of this invention relates to a velocipede in which the frame which supports the seat is horizontally pivoted to the frame in which the driving-wheel is journaled; and it consists in the form and location of a spring which reacts between said pivoted members to uphold the seat.

In the drawings, A is the driving-wheel.

B is the steering-wheel.

C is the seat-supporting frame.

F is the steering-post, journaled in the steering-head C′ at the forward part of the seat-supporting frame and terminating in the steering-fork F′.

D is the drive-wheel frame, which is pivoted to the seat-supporting frame, preferably as illustrated at E near the pedal-crank-shaft bearing E′.

C^2 is the arm of the seat-supporting frame which immediately supports the seat.

D′ is an arm of the driving-wheel frame, which extends up toward the seat, being a fork with its head outside the drive-wheel and affording a connection substantially in the plane of the drive-wheel for the spring G, which is further connected at the other end to the arm C^2 of the frame C.

It is desirable that the spring G, reacting between the arm C^2 of the seat-supporting frame and the arm D′ of the drive-wheel frame, should not be limited in its action to the actual distance between the points at which it is connected to the said arms, respectively, when the seat is without a load, because in order to obtain the necessary elasticity and range of reaction, if it were thus limited, it would be necessary that said two points of connection should be far enough apart to admit in the line between them a spring of sufficient strength and elasticity for the purpose, and this requirement would necessitate separating the said two points farther than would be desirable or convenient in the construction of the machine—that is, would necessitate locating the seat farther from the drive-wheel than desirable. The specific purpose of this part of my invention, therefore, is to provide a spring of such form that, although reacting between said two points of connection, it may in such reaction pass down on both sides of the drive-wheel, or in extreme cases on both sides of the arm of the seat-supporting frame to which it is connected, not being confined, therefore, to the space between the points of connection. For this purpose of construction the spring G, as shown, is of spring wire or rod folded to form two similar arms G′ G′, which are coiled at g' g' about the same axis, and from said coils extend in the same plane at an angle to the plane of the portion between the coils and the middle bend, and are secured at some distance apart on one of the frames to be connected by the spring, while the middle bend is secured upon the other of the said connected parts. As illustrated, the ends are connected to the arm D′ of the drive-wheel frame, and the bend is connected to the arm C^2 of the seat-supporting frame. The distance laterally between the two coils g' g' is sufficient to admit the drive-wheel and the mud-guard K (if a mud-guard is located over and in front of the drive-wheel at that point) and is sufficient to admit the arm C^2 of the seat-supporting frame. In case the weight on the seat and the jolting of the machine on the road is sufficient to cause the horizontal pivot E of the two frames to be depressed considerably, the points of connection of the spring G to the arms C^2 and D′, respectively, will be forced toward each other, and the coils g' g' of the spring will be forced down and rearward, one on either side of the drive-wheel, or if the connection of the spring at its ends to the arm D′ be made rigid and the connection of the bend to the arm C^2 be made pivotal, the coils may pass on either side of the arm C^2. Both connections of the spring may be made rigid, and in that case the flexible elasticity of the arms of the spring, as well as the elasticity of the coils, is brought into play, and I

prefer to pivot the spring at both its connections, thereby practically limiting the elastic reaction to the coils; but I desire to embody an advantage which the rigid connection affords—viz., that the spring serves by its own resistance to torsion about a line transverse to the axis of the coils to prevent twist or distortion of the two frames relatively to each other. This advantage afforded by rigid connection I retain to a large degree with the pivotal connection by making such pivotal connections as broad as possible, as seen in the drawings, particularly in the plan view of Fig. 2. The desired breadth of bearing is attained at the forward end or bend of the spring by leaving between the two arms which extend from the bend any desired portion G^3 of the rod or wire to serve as the pivotal portion, which is lodged in a bearing c^2, provided for it on the arm C^2. At the rear end of the spring the desired breadth is attained by securing the two ends of the spring in the ends of the short shaft G^2, which is lodged in the bearing d', provided at the head of the forked arm D′ of the frame D. It will be observed that as thus constructed the spring operates like a pair of links horizontally pivoted together at the axis of the coils g'. Such jointed-link connection, in its capacity merely as a link connection and without elasticity, constitutes a brace between the two frames, which, being flexible fore and aft, permits the two frames to vary their relation in the vertical plane fore and aft, but, being comparatively inflexible transversely to such plane, tends to prevent change of relation of the two frames transversely.

The second part of my invention relates to the construction of the backbone and the steering-head of a velocipede, and consists in making such backbone and steering-head of one piece of tubing.

C C^3 is a single piece of tubing of which the portion C constitutes the backbone, while the portion C^3 constitutes the tubular steering-head—that is, the head through which the steering-post extends from the steering-fork F′ below the head to the steering-handle bars F^2 above the head. This part of the invention consists, further, in providing a re-enforcement for the tube which constitutes the backbone and steering-head, such re-enforcement being applied at the bend and being preferably provided with a bearing for the steering-post. The tube C C^3 is bent at c to set the portion C^3 at the angle to the backbone necessary to adapt it to serve as a steering-head. Then in order to admit the steering-post through such steering-head the pipe is apertured at the outside of the bend. A longitudinal slot c' is a convenient mode of forming this aperture, the metal on either side of such slot being stretched aside sufficiently to allow the steering-post to pass through.

H is a re-enforcement bracket, which may be formed either of sheet metal or of tube, but in either case is, when formed, substantially a tubular bracket with the ears H′ H′, extending rearward on opposite sides and shaped to fit the backbone at and below the bend between it and the steering-head. This bracket is applied to the tube C C^3 on the outer side of the bend and covering the slit c' and with its tubular lower terminal portion in line with the steering-head C. The upper end of this bracket laps onto the straight portion of the steering-head above the bend, and the ears H′, as stated, are shaped to conform to the bend and underlap the backbone below the bend, and, being thus fitted to the backbone and steering-head, said bracket is brazed thereunto, stiffening the frame at the bend between the head and backbone. The steering-post F may be provided with any customary form of bearings in the steering-head, and when the bracket H is employed I prefer to provide the lower bearings H^2 on said bracket, and it is so illustrated in the drawings. The junction between the bracket and the backbone and head may be made very secure by suitably forming the metal on either side of the slit through which the steering-post F passes, shaping the same to the inner surface of the bracket, thereby increasing the surfaces in contact for the purpose of brazing.

Another part of my invention consists in providing a re-enforcement for the steering tube or post at the bottom of the head which is journaled on such post—that is, at the plane of the lower end of the head, where strain tending to break or bend the post is most severely experienced. For this purpose I provide an interior lining or re-enforcement F^4 for the tubular steering-post F, such lining being brazed within the post at the lower end of the latter, extending thus within the fork-head forging F^3 and for a short distance above the level of the bearing H^2. This re-enforcing lining is most conveniently made of tube of suitable size to fit closely into the tube which forms the steering-post; but I do not limit myself to making it of tube.

I claim—

1. In a velocipede, in combination with the seat-supporting frame and the drive-wheel frame connected together elastically in respect to action in a vertical plane, each of said frames having an arm which extends to a point in the plane of the drive-wheel, a spring having its ends connected to said arms, respectively, beyond the drive-wheel rim and reacting between said arms, such spring being bifurcated in the plane of the drive-wheel between its points of fastening to the arms, respectively, whereby the wheel may enter between its two parts as the spring yields, substantially as set forth.

2. In a velocipede, in combination with the seat-supporting frame and the drive-wheel frame connected together elastically in respect to action in a vertical plane, each of said frames having arms which extend to a point in the plane of the drive-wheel, a spring

pivotally connected at its ends to said arms, respectively, beyond the drive-wheel rim and reacting between said arms, said spring being folded about an axis transverse to the plane of the wheel and bifurcated in the plane of the wheel between the points of fastening of its arms, respectively, substantially as set forth.

3. In a velocipede, in combination with the seat-supporting frame and the drive-wheel frame connected together elastically in respect to action in a vertical plane, each of said frames having an arm which extends to a point in the plane of the drive-wheel, a spring having broad pivotal connection at its ends to said arms, respectively, and folded intermediate its ends about an axis transverse to the plane of the wheel, whereby as a jointed link connecting the frames at a distance from their elastic connection it serves to resist lateral twist or distortion of said frames relatively to each other, substantially as set forth.

4. In a velocipede, a tubular backbone and tubular steering-head in one piece, substantially as set forth.

5. In a velocipede, a tubular backbone bent upward at the forward part to form a tubular steering-head and apertured in line with the head portion to permit the steering-rod to protrude at the lower end of such head, substantially as set forth.

6. In a velocipede, the tubular backbone bent upward at the forward part to form a tubular steering-head and apertured on the outer side of the bend in line with the said portion to permit the steering-post to protrude at the lower end of such head, in combination with the re-enforcing tubular bracket applied and joined on the outer side of the bend and opening at the lower end in line with the axis of the head portion, substantially as set forth.

7. In a velocipede, the tubular backbone bent upward at the forward part to form a tubular steering-head and apertured on the outer side of the bend in line with the said portion to permit the steering-post to protrude at the lower end of such head, in combination with the re-enforcing tubular bracket applied and joined on the outer side of the bend and opening at the lower end in line with the axis of the head portion, and the steering-post extending through the steering-head and the re-enforcing bracket, said bracket having the lower bearing for such steering-post, substantially as set forth.

8. In a velocipede, in combination with the tubular steering-post and the steering-head in which the same is journaled, an interior re-enforcing lining for said tubular post, such lining extending both above and below the plane of the lower end of the head, substantially as set forth.

In testimony whereof I have hereunto set my hand, in the presence of two witnesses, at Chicago, Illinois, this 20th day of January, 1891.

THOS. B. JEFFERY.

Witnesses:
CHAS. S. BURTON,
JEAN ELLIOTT.