

(No Model.)

J. S. COPELAND.
VELOCIPED.

No. 358,960.

Patented Mar. 8, 1887.

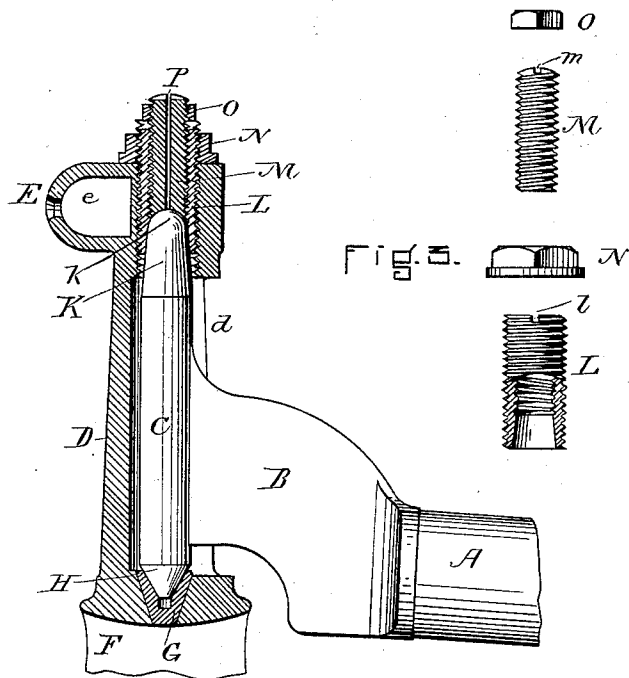


Fig. 1.

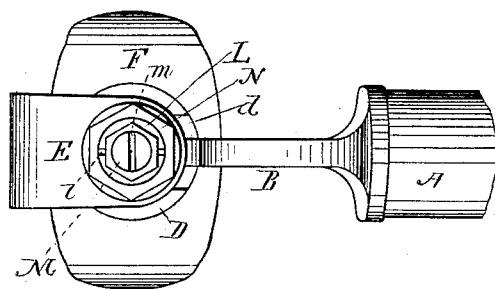


Fig. 2.

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VELOCIPEDÉ.

SPECIFICATION forming part of Letters Patent No. 358,960, dated March 8, 1887.

Application filed November 26, 1886. Serial No. 219,876. (No model.)

To all whom it may concern:

Be it known that I, JAMES S. COPELAND, of the city and county of Hartford, in the State of Connecticut, have invented certain new and useful Improvements in Velocipedes, of which the following is a specification.

These improvements were designed especially for the steering-heads of bicycles, and relate especially to the devices for holding the steering-spindle in the steering-head, and for adjusting these devices for suitable bearings, and to take up the wear thereof; but they may be equally applicable in tricycles or other velocipedes, and in any part thereof wherever it is desirable to hold a rotating spindle by means of a step and an adjustable seat opposite to the step in the frame of the part thereof in which the spindle operates.

Heretofore in bicycle-heads of the class known as "cylindrical" heads, in which a spindle upon the neck and perch has been held so as to partly revolve in the interior of the head, it has been usual to construct them with a step in the lower part of the head having a conical recess, the lower end of the spindle being of conical form, and with a threaded movable bolt in the upper end of the spindle, having either a conical projection or a conical recess to meet a corresponding conical recess or conical projection at the upper end of the spindle, and a set-nut to hold the bolt in position when once it has been adjusted. An improvement upon this construction was heretofore made by H. B. Hicks and shown in his Patent No. 250,917, dated December 13, 1881, in which the two ends of the spindle were made hemispherical or rounded in form, and the step and the seat in adjusting-bolt were made of corresponding form, whereby better adjustment and a very desirable construction was obtained; and my present construction may be considered in one aspect as an improvement upon the construction shown in that patent. In such structures as these the strains are often great, the jar constant, and the wear comes most on one side of the upper bearing of the spindle and adjusting-bolt, and there is a constant tendency to wear the upper bearing or upper center of the spindle out of shape, and also to jar the adjusting-bolt loose,

and also to cause a lateral wearing away of the seat in the adjusting-bolt more than a vertical wear.

It is the object of my present improvement to obviate these difficulties and to produce a bearing for the upper steering-center which may be adjusted correctly both vertically and laterally, and so as to take up both the wear caused by end-thrust and the wear caused by lateral or side strain, and to make these adjustments independent and so as to distribute the wear caused by side strain around a lateral bearing in the seat offered to the upper steering-center.

In the drawings, Figure 1 shows the neck and spindle of a bicycle and the head and my improved adjusting devices in one form in vertical section. Fig. 2 shows a top plan view of the same contrivance; and Fig. 3 shows certain details, which will be further described.

A is a tenon to receive a hollow perch.

B is a neck connecting the perch and frame with the steering-spindle, and C is a steering-spindle.

D is a cylindrical bicycle-head, having an opening, *d*, for insertion of the spindle and to allow a rocking or partial revolution of the spindle and neck, and a lug, E, for a handle-bar, and F is a front fork.

G is a step for the lower end of the spindle C, or for the lower steering-center, H. This steering-center H may be either in conical form, as shown in the drawings, or of rounded or hemispherical form, like the upper steering-center of the same spindle, the step G being of corresponding conical or rounded form to receive it.

I make the upper steering-center or the end of the spindle C opposite to the step, by preference, of a slightly tapering form, as shown at K, for a considerable portion of it, and I make, by preference, the end *k* of rounded or hemispherical form, though this may be of conical form, as shown at H. I bore the head, as has been customary, and make an internal thread in the bore, as is customary, to receive the adjusting-bolt; but instead of using one adjusting-bolt filling this bore and threaded to correspond with this internal thread, I use the devices now to be described.

L is a cylinder, threaded on the outside to correspond with the thread in the head, and threaded on the inside for a part of its length, and having at its lower end or for the part that is adjacent to, and to afford a bearing for, the upper steering-center, K, made with a plain bearing-surface corresponding in form to the form of the steering-center K—that is, of corresponding size—correspondingly tapered or rounded or shaped, so that when placed upon the upper steering-center, K, in position it shall fit with a free bearing fit, and by forcing it farther on it shall fit tightly, and by withdrawing it somewhat it shall fit loosely.

M is an adjusting-bolt of smaller diameter, externally threaded to fit the internal threads in the cylinder L, and having its lower end formed to correspond with the end of the upper steering-center, k—that is to say, correspondingly rounded or coned to make a good bearing thereon. It may also have the oil-duct P through its center, to afford means of lubrication.

N is a set-nut working upon the exterior threads of the cylinder L, and having a shoulder to fit and bear upon the upper surface of the head D.

O is a set-nut threaded to correspond with the external threads of the bolt N, and having a shoulder to afford a frictional contact-bearing upon the top of the cylinder L. The bolt M has a groove, m, across the end, to afford a seat for a screw-driver, and the cylinder L has a similar slot, l, to afford seats for the prongs of a spanner.

In operating this contrivance the spindle C is inserted at its upper end into the open head D and carried to position, so that the lower steering-center, H, shall fall into the step G. The cylinder L is then inserted in the head and screwed down by means of a spanner, taking in the nicks l until it has a proper bearing on the upper steering-center, K. The nut N is then screwed down upon the upper end of it and tightened to the head, the cylinder being held from turning with the set-nut N by means of the spanner. The bolt P is then inserted and screwed down to an appropriate bearing upon the end k of the upper steering-center, and is screwed in position by the nut o, which is screwed down upon the bolt so as to take a bearing upon the upper end of the

cylinder L, the bolt being held from turning while the set-nut is forced to position by a screw-driver in the slot m. As wear occurs, if it be that caused by end-thrust, it is taken up by loosening the nut O, setting up the bolt M, and then setting back the nut O to hold it. If to take up for wear caused by lateral or side strain, the bolt M and nut O are loosened from their positions. The nut N is loosened, and the cylinder L, by means of the spanner, is turned until it takes up for wear and offers another bearing-surface to the worn part on the center K, the nut N being then forced back to position, and the adjustment completed by means of the bolt M and nut O, as before.

It is obvious that changes in form may be made, and that this improvement may be applied to the steering-centers of tricycles or to joints in tandems or other places in velocipedes without departing from the substance of my invention; and I do not mean to be limited to the precise form and arrangement shown and described.

I claim as new and of my invention—

1. The combination of a spindle and step and an adjustable two-part seat opposite to the step, one part of the seat offering a bearing-surface to the spindle to meet end-thrust, and movable to take up the wear thereof, and the other part of the seat offering a bearing-surface to the spindle to meet side strain and to take up the wear thereof, and a set device holding the two parts in operative positions relatively to the spindle and to each other.

2. In combination with the steering-head and the steering-spindle of a velocipede, a threaded adjustable bolt having at one end a bearing for the spindle and at the other end a set-nut, and an externally and internally threaded adjustable cylinder having a set-nut at one end and at the other end an internal bearing surface for the spindle extending longitudinally upon the spindle beyond the bearing of the bolt.

3. The combination of a spindle, C, step G, frame D, cylinder L, bolt M, and nuts N O, substantially as they are shown and described.

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Witnesses:

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