(No Model.)

W. H. EVANS.

FRAME FOR BICYCLES.

No. 604,743. Patented May 31, 1898.

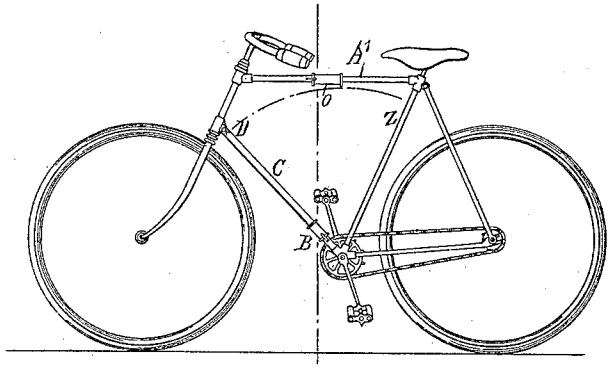


Fig. 1.

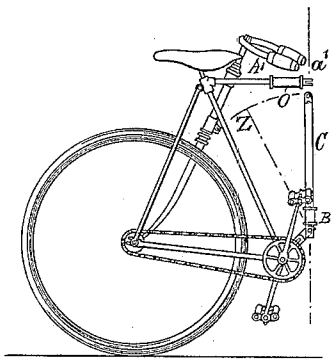


Fig. 2.

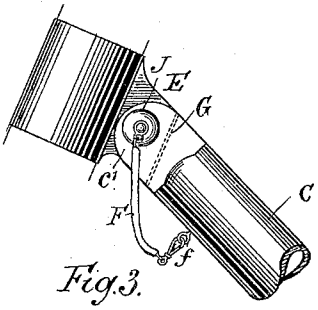


Fig. 3.

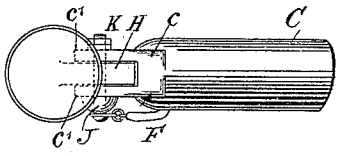


Fig. 4.

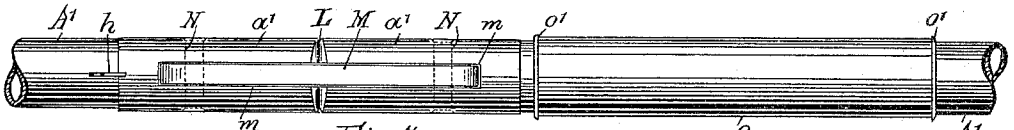


Fig. 5.

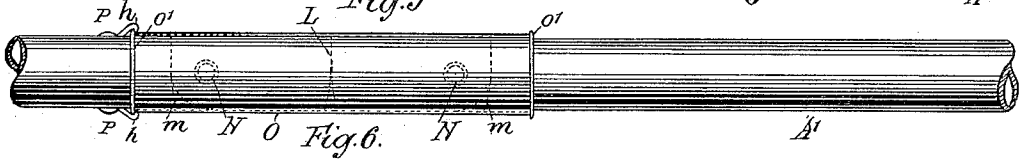


Fig. 6.

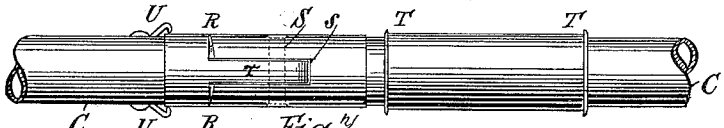


Fig. 7.

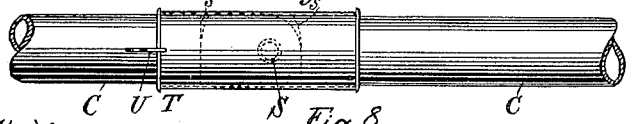


Fig 8.

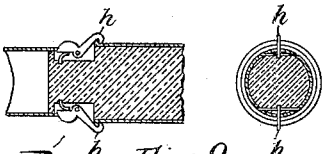


Fig. 9.

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UNITED STATES PATENT OFFICE.

WILLIAM HUGH EVANS, OF CARDIFF, ENGLAND.

FRAME FOR BICYCLES.

SPECIFICATION forming part of Letters Patent No. 604,743, dated May 31, 1898.

Application filed October 16, 1897. Serial No. 655,368. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM HUGH EVANS, proprietor of printing-works, a subject of the Queen of England, and a resident of 3 Edwards Terrace, Cardiff, in the county of Glamorgan, England, have invented new and useful Improvements in or Relating to the Frames of Bicycles, of which the following is a specification.

The object of this invention is to construct or fit bicycle-frames in such a way that they are adapted to be folded so as to bring the front and back wheels together side by side and practically parallel to each other, thereby effecting economy of space for the purpose of storage, facility in handling, and the lessening of risk of injury to the machine during transit.

Briefly stated, the invention consists in making the lower member of the frame in two parts jointed together near the pedal-axle, the front end being detachably connected to the steering-pillar, so that said lower member can be rotated in a vertical plane, and in making the upper member also in two parts, which are jointed together so as to be rotated in a horizontal plane.

In the accompanying drawings, Figure 1 is a side elevation of a bicycle the frame of which is constructed according to this invention, and Fig. 2 is a view of the same when in the folded position. Figs. 3 and 4 are respectively side elevation and plan of the detachable connection for the front end of the lower member. Fig. 5 is an elevation of the joint for the two parts of the upper member, the sleeve being off; and Fig. 6 is a plan of same with the sleeve in position thereon. Figs. 7 and 8 are similar views of the joint for the lower member, and Fig. 9 shows in longitudinal and cross section a spring-clip suitable for holding the sleeves on the joints.

The same letters of reference, where they occur, are used to denote the same or corresponding parts in the various figures.

Referring to Fig. 1, it will be seen that the bicycle there shown is of the ordinary character, but the frame is jointed at three parts, the joints being marked A, B, and D, respectively. The joint A is shown separately on an enlarged scale in Figs. 5 and 6. The ends of the two parts a' of the upper member A′ of the frame are connected together by a link M, turning on pivots N, passing through the ends a', as shown in Fig. 5. This link lies in a central longitudinal slot m, formed one-half in each of the ends a', and cut only partially through the material, so that the upper member A′ can only be folded in one direction. For the same purpose and also to afford greater rigidity when in the open position the extreme ends of the parts a' are butted at one side, as shown at L in Fig. 6. This long slotted link-joint may be made either hollow or solid, the link M giving the necessary length to enable the wheels to be folded quite close together without strain on the top tube or joint. The ends a' may be integral with the two parts of the upper member A′, or they may be separate pieces brazed or otherwise rigidly secured in or to the ends of the parts of the upper member A′.

When in the open position, the joint is made rigid by a sleeve O, which is constructed to fit tightly over the joint, covering the whole of it, and is secured in position by a spring-clip P—such, for example, as that shown in Figs. 6 and 9—which consists of a pair of spring-levers pivoted at diametrically opposite parts of the upper member A′ and having noses h, which engage in a collar, flange, or projections O′ on the end of the sleeve O. Any other suitable fastening device may, however, be adopted for holding the sleeve O in position on the joint.

The joint B at the bottom of the lower member C, Fig. 1, is made in the form of a groove-and-tongue joint, as shown in Figs. 7 and 8, the tongue r on one of the ends R being received in a slot s in the other end S′, to which it is pivoted by the pivot S. T is a sleeve similar to the sleeve O already described, and U is a fastening to hold same secure when covering the joint. This joint is also butted, so that it will only open in the desired direction, and may be made integral with or be rigidly secured to the lower member C as with the joint in the upper member.

The joint D at the front end of the lower member C is a separable joint and is shown in Figs. 3 and 4. It is also a tongue-and-groove joint, the tongue H being preferably formed on the lug E on the steering-pillar and provided with bottom flanges or small

projections or enlargements on each side to serve as a rest or stop for the cheeks *c'* of the grooved end *c* of the member C when the parts of the joint are in proper position. A square hole is bored through the cheeks *c'* and the tongue H, through which said hole a square bolt J is passed and secured by lock-nuts K. To prevent loss of the bolt J, its head is attached to a chain or other flexible connection F, the other end of which is secured by a spring-fastening to a ring *f* on the member C. When the nuts are undone, this spring-fastening may be released, the nuts threaded on the chain or connection F, and the latter secured again to the ring *f*. The nuts and the bolt are then secure against loss.

When the two parts of the joint D are separated by removing the nuts and bolt, the lower member C can be turned on the joint D through an arc of a circle about the pivot S represented by the dotted arc D Z in Fig. 1. A spring or other clip or fastening device may be fixed to the saddle-pillar at Z, to which the lower member C may be secured when the machine is in the folded position, Fig. 2, to prevent breakage or damage and to facilitate the handling of the folded machine, and for the same purpose when folded the two wheels may be secured together by a simple strap or clip or other device.

If desired, the frame may have two joints only instead of the three, as above described—namely, the link-joint A and the separable joint D—in which case when the frame is folded the lower member projects from the pedal-crank axle at the original angle. To make such a frame ready for folding, it would only be necessary to release the link-joint A and to remove the bolt from the joint D. Then the parts of the frame could be rotated in a horizontal plane about the joint A. It will, however, be evident that the form already described, and shown in the drawings—*i. e.*, with the three joints A, B, and D—is preferable, as it insures greater compactness and is very little more expense or trouble.

It is obvious that the invention may be applied to bicycle-frames in course of construction, or it may be applied to bicycle-frames at present in use.

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

1. In a bicycle-frame, the combination of an upper member divided in two parts, with a connecting-link, the opposite ends of said link being pivoted to the said parts of the upper member, a sleeve movable on said member and over the link-joint aforesaid, a lower member also in two parts pivoted together, a sleeve movable on said lower member and over the pivot-joint aforesaid, and a separable joint connecting the front end of the said lower member with the machine-frame substantially as and for the purpose herein described.

2. A bicycle-frame comprising an upper member made in two parts secured together by a link-joint, a sleeve movable on said upper member and over the link-joint aforesaid, and a lower member the front of which is removably secured to the steering-pillar substantially as and for the purpose herein described.

WILLIAM HUGH EVANS.

Witnesses:
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EDWARD LEWIS.