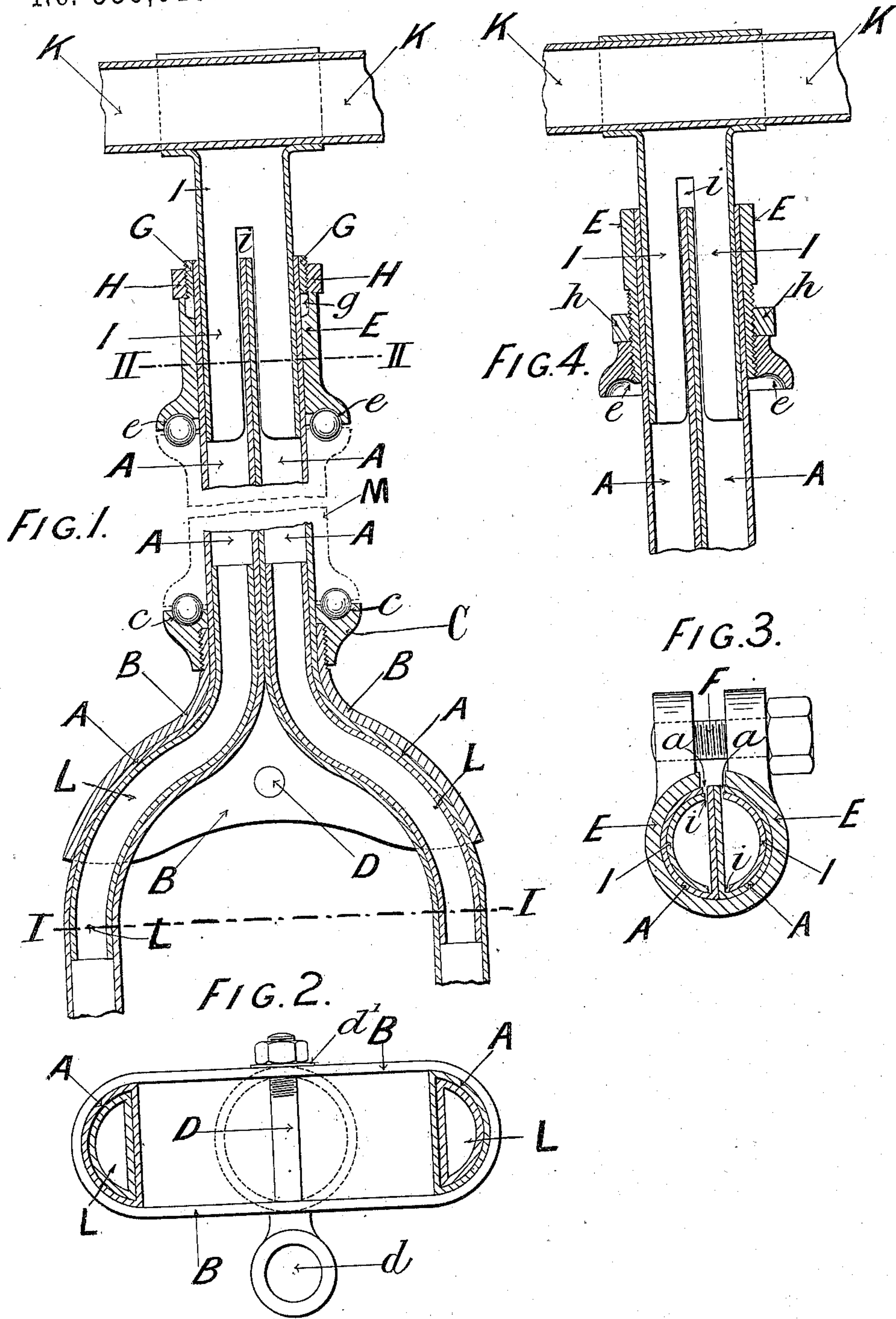


(No Model.)

A. W. LOTZ & J. HUZELSTEIN.
STEERING FORK FOR BICYCLES OR OTHER VEHICLES.

No. 556,010.

Patented Mar. 10, 1896.



WITNESSES:

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UNITED STATES PATENT OFFICE.

ARTHUR WILLIAM LOTZ AND JOSEPH HUZELSTEIN, OF PARIS, FRANCE.

STEERING-FORK FOR BICYCLES OR OTHER VEHICLES.

SPECIFICATION forming part of Letters Patent No. 556,010, dated March 10, 1896.

Application filed June 19, 1894. Serial No. 515,075. (No model.) Patented in France December 11, 1893, No. 234,702, and in England March 27, 1894, No. 6,203.

To all whom it may concern:

Be it known that we, ARTHUR WILLIAM LOTZ, a subject of the Queen of Great Britain, and JOSEPH HUZELSTEIN, a citizen of the French Republic, residing at Paris, France, have invented a certain new and useful Improvement in Steering-Forks for Bicycles or other Vehicles, (for which patents have been granted in France, No. 234,702, dated December 11, 1893, with certificate of addition, dated March 17, 1894, and in Great Britain, No. 6,203, dated March 27, 1894,) of which the following is a full, clear, and exact specification.

Our invention relates to the forks for holding the steering-wheels of cycles, and more particularly to forks which are used in combination with what are known as "ball-heads"—that is, to the case where the stem or upper part of the fork passes through a cylindrical guide-sleeve forming part of the cycle-frame and containing two ball-bearings, one at the top and the other at the bottom of the guide-sleeve. Such fork-tubes are usually composed of, first, two symmetrically-arranged fork-tubes of the same shape, either oval or elliptic, and extending from the hub to the fork-crown; second, a fork-crown uniting the said fork-tubes; third, an upper tube or fork-stem brazed onto the fork-crown. The fork-stem is placed in the interior of the ball-head or guide-sleeve and carries at the top the handle-bar, the stem of which is fixed to the fork-stem by means of a collar.

Our improvement has for its objects to dispense with the fork-crown, which is liable to break at the junction with the fork-stem or inner tube of the ball-head, to substitute for this inner tube the prolongation of the two fork-tubes, and generally to increase the strength of the fork and to facilitate the attachment of the handle-bar in such a manner that the latter will not turn, even if the collar be not screwed tight. To attain these objects our new fork is composed of two tubes of half-round section, so that the same will form, when joined together with flat sides, one tube of circular circumference with a longitudinal partition. These fork-tubes are bent and spread outward, so as to constitute a fork of the width necessary to allow the pas-

sage of the wheel. After bending, the upper parts of the semicylindrical fork-tubes are placed one upon the other with their flat sides facing each other and are then permanently connected and retained in position by means of a head-piece or metal cap which surrounds and tightly compresses the arched portion of the two curved rods. The said cap is secured in position by means of a screw-bolt and carries at its upper end a screw-nut which forms a ball-race for the ball-head. The top part of the tubular fork-stem, composed of the said semicircular tubes with their flat sides in contact, passes through a strong collar which connects the said tubes and may be arranged in such a manner as to serve also for adjusting the ball-head or guide-sleeve of the cycle-frame relatively to the fork-stem and for tightening the handle-bar stem, as will be hereinafter more fully explained.

In order to enable our invention to be better understood, we have represented an example of the improved steering-fork and accessories in the accompanying drawings, in which—

Figure 1 is a vertical section showing the whole arrangement of the fork. Fig. 2 is a horizontal section along line I I of Fig. 1, viewed from below, to show the manner in which the two hollow semicircular rods are held together by a metal cap. Fig. 3 is a horizontal section of the upper part of the fork along line II II of Fig. 1, and Fig. 4 is a vertical section of a modified fork-head.

The two semicircular hollow bars A A, symmetrically curved and exactly alike in shape, are simply put together with their flat sides facing each other, so that their straight upper parts jointly form the tubular stem of the fork which is to be located within the ball-head or guide-sleeve of the machine-frame.

At the part where the two rods A A branch off to afford room for the wheel they are firmly connected by means of a steel cap B, or by any analogous device constituting the head of the fork, the lower portion of the cap being nearly oval and covering the rounded portion of the fork-rods to increase their resistance, as illustrated by Figs. 1 and 2. The two faces of this cap are firmly pressed against the said rods A by means of one or more

screws or bolts, but preferably by one strong bolt D, which on one side carries an eyelet *d*, serving as a guide for the brake-rod, and on the other side a washer *d'*, which may serve to attach the mud-guard. The upper circular portion of this cap (which may be split if desired) is also very firmly tightened upon the two rods A by means of a screw-nut C, the upper face of which constitutes the cup or race for the balls, said balls supporting the ball-head or guide-sleeve M of the machine-frame. (Indicated in Fig. 1 by dotted lines.) This connection of the two rods A A may be supplemented by other suitable devices—for instance, by the addition of a metal stay placed within the angle which the said rods form above the tightening-bolt D or of a small pin or transverse key adapted to resist any tendency of the hollow fork-rods to shift in a longitudinal direction.

As will be seen from Fig. 3, the upper ends of the rods A A are split at *a*, so that they may be used for clamping or tightly grasping the stem I of the handle-bar, and they are retained by the collar E, which fits them exactly, and is split or slotted, as usual, for part of its length, so that it may yield to the action of the screw-thread on the transverse bolt F in order to grip the rods A A and thereby also the stem of the handle-bar.

The collar E carries at its lowest part the ball-race *e*, which is concentric to the fork-stem and corresponds in diameter to the ball-race on the ball-head or fork-head M of the machine-frame. Upon the end of the hollow rods A A there is fitted an externally-threaded ferrule G, onto which is screwed the adjusting-nut H, while the top of the collar E has a circular recess *g* adapted to receive the said ferrule.

In the modification shown in Fig. 4, which we employ in preference, the ball-cup *e* is a separate piece screwed onto the threaded end of the collar E, in order that the position of the ball-cup *e* along the fork-rods A A may be varied, and with it also the position of the ball-head or guide-sleeve. A counter nut *h* serves to retain the said cup *e* in place when it has once been placed at the required height.

The stem I of the handle-bar K has a longitudinal slot, or, if made hollow, as shown, it has a pair of diametrically-opposite slots *i*, in order that it may enter the partitioned tube formed by the junction of the two hollow fork-bars A. The said handle-bar is thus prevented from turning about its own axis, even though the collar E be insufficiently tightened to keep it quite steady.

We prefer to make the two half-round fork-bars of steel tubes, either welded or brazed; but they may be made solid and of other suitable material, in which case the connection between the fork-bars and the stem of the handle-bar must be modified.

The arched portion of the fork-tubes shown in Figs. 1 to 4 may be strengthened by an internal lining or tube L, said lining being

introduced into each of the said fork-tubes before it is closed and bent.

We are aware that it has been proposed to make a steering-fork from a single tube, the lower part of which is split longitudinally, so as to produce semicircular tubes, which are then spread apart to form the two legs of the fork, and we do not claim a split tube, nor do we generally claim the use of half-round tubes for steering-forks, and we wish it to be understood that our claim does not extend to velocipedes in which the steering-fork pivots on an axis placed outside the fork-stem and parallel to the same, such as were generally used before the invention of the ball-head in or about the year 1889.

What we claim is—

1. In velocipedes, the combination of a steering-fork composed of two half-round bars bent outward symmetrically near the middle of their length, and joined together face to face above the bend so as to form the cylindrical fork-stem, with a cap fitting over the bent part of the said fork, and a screw-bolt adapted to press the sides of the cap against the fork, substantially as described and for the purpose specified.

2. In velocipedes, the combination of a steering-fork composed of two half-round bars bent outward symmetrically near the middle of their length and joined together face to face above the bend, so as to form a cylindrical fork-stem, with a cap fitting over the bent part of the said fork and adapted to be pressed against the sides of the same by means of a screw-bolt connecting the sides of the cap below the junction of the fork-bars, a screw-nut screwed on the cylindrical upper extremity of the said cap and having in its upper face a ball-race concentric to the fork-stem, a collar placed over the upper part of the fork-stem so as to keep the two half-round bars of the same in contact with each other and having in its lower face a ball-race concentric to the fork-stem, and means for adjusting the height of the said collar above the face of the nut screwed on the top of the cap, substantially as described and for the purpose specified.

3. In velocipedes, the combination of a steering-fork composed of two semicircular tubes bent outward symmetrically near the middle of their length and joined together face to face above the bend so as to form a hollow cylindrical fork-stem, with a handle-bar having a tubular stem provided with two diametrically-opposite slots and fitting into the upper extremity of the said fork-stem, substantially as described and for the purpose specified.

4. In combination with the steering-head or ball-head of a velocipede, a steering-fork stem pivoted thereto and composed of two semicircular tubes having at their upper ends longitudinal slots, a longitudinally-slotted handle-bar stem inserted within said steering-fork stem, a collar fitted on the upper part of

the said fork-stem and secured thereto, the lower end of the collar being screw-threaded and the upper end forming a clasp or clamp adapted to contract the slit part of the fork-stem, a ball-cup screwed on the threaded part of the said collar and having in its lower face a ball-race concentric to the fork-stem, and an adjusting-nut screwed on the threaded part of the collar above the ball-cup, the said ball-cup being adapted to run on the balls of

the upper ball-bearing, substantially as described and for the purpose specified.

In testimony whereof we have signed this specification in the presence of two subscribing witnesses.

ARTHUR WILLIAM LOTZ.
JOSEPH HUZELSTEIN.

Witnesses:

EDWARD P. MACLEAN,
DAVID T. L. FULLER.