No. 619,339. Patented Feb. 14, 1899.

W. H. PENSEYRES.

BICYCLE CRANK SHAFT.

(Application filed Jan. 8, 1898.)

(No Model.)

Fig.1.

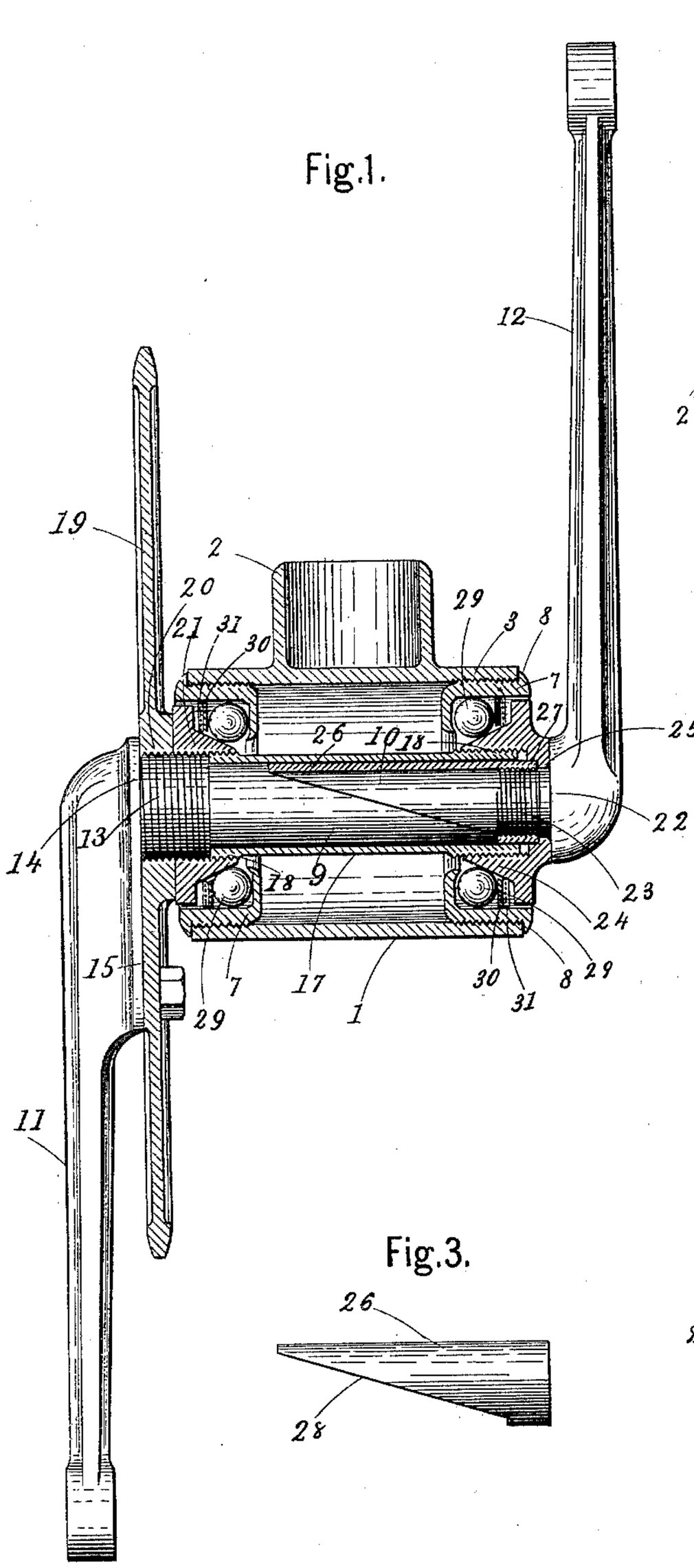

Fig.2.

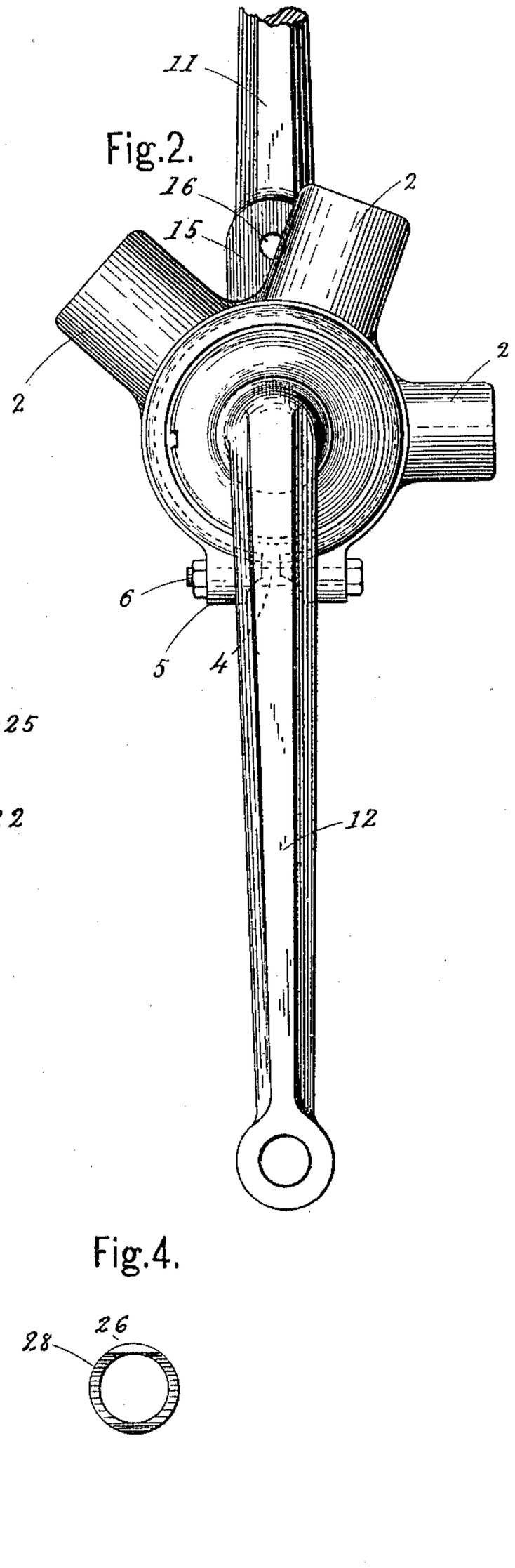

Fig.3.

Fig.4.

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WILLIAM H. PENSEYRES, OF BUFFALO, NEW YORK.

BICYCLE CRANK-SHAFT.

SPECIFICATION forming part of Letters Patent No. 619,339, dated February 14, 1899.

Application filed January 8, 1898. Serial No. 666,045. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. PENSEYRES, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Bicycle Crank-Shafts, of which the following is a specification.

My invention relates to a divisional crank-shaft; and the object is to provide a simple and efficient means for assembling or disengaging the divisions with or from each other.

It also relates to certain details of construction, all of which will be fully and clearly hereinafter described and claimed, reference being had to the accompanying drawings, in which—

Figure 1 represents a vertical central section through a crank-hanger, the divisional shaft, and its locking and antifriction mechanism. Fig. 2 represents an end elevation of the crank-hanger. Fig. 3 represents a side elevation of the supplemental sleeve. Fig. 4 represents an end view of the supplemental sleeve.

Referring to the drawings for the details of construction, in which like numerals represent like or duplicate parts, I designate the crank-hanger, which is of the usual barrel type, by the numeral 1. It is provided with the usual lugs 2 for attachment to the frame-tubes, the interior screw-threaded end portions 3 for receiving the bearing-cases, the slots 4, and the lugs or ears 5, which are provided with screw-threaded openings to receive and retain the locking-bolts 6.

The bearing-cases 7, which are duplicates of each other and are therefore designated by the same numeral, are provided with peripheral screw-threads adapted to engage with the screw-threads in the end portions 3 and the flanges 8, which extend peripherally therefrom near the outer edges and form shoulders against which the outer edges of the crank-hanger abut, thus limiting the entrance of the bearing-cases in the ends thereof.

The divisional crank-shaft comprises the two separable portions 9 and 10, which differ in certain details, as will appear farther on. They are provided with inner reduced end portions, which when interlocked together form a shaft of substantially the same circumference throughout, and with cranks 11 and 12, which are bent therefrom at substantially right angles. The shaft portion 9, with its crank 11, I preferably designate as the "sprocket-wheel-supporting" portion, and the shaft portion 10, with its crank 12, as the "locking-device-supporting" portion. The outer end of the shaft portion 9 is provided with an enlarged peripheral screw-threaded portion 13, which at the juncture with the crank merges into the enlarged base portion 14, and the crank 11 is enlarged for a short distance from its juncture with the shaft portion 9 to provide a base 15, which is provided with a screw-threaded opening 16, the purpose of which will appear farther on.

The tubular sleeve 17, into which the shaft portions are fitted, is provided at each end with a peripheral screw-thread 18, and the sprocket-wheel 19 is provided with an interior screw-thread 20, adapted to engage with the enlarged screw-threaded portion 13 on the shaft.

The enlarged screw-threaded portion 13 on the shaft is sufficiently long to receive the sprocket and also the outer portion of the cone 21, and as the screw-threaded ends 18 of the sleeve 17 are of substantially the same lead as the screw-threaded portion 13 the cone 21 is screwed partially upon the enlarged portion 13 and partially upon the sleeve end and firmly against the sprocket, thus firmly locking the sprocket and sleeve upon the shaft. To additionally secure the sprocket thereto, a bolt is preferably passed through an opening in the sprocket and into the screw-threaded opening 16.

The shaft portion 10 is smaller in circumference than the portion 9, and it enlarges slightly before its juncture with the crank into the shoulder 22.

A peripheral screw-threaded portion 23 is provided upon the shaft portion 10 at a slight distance inwardly from the shoulder 22, the purpose of which will be explained farther on.

The cone 24, which I term the "locking-cone," differs slightly from its companion cone 21, inasmuch as its interiorly-screw-threaded opening terminates at or near its outer end in an interior flange or reduced portion 25, which forms a shoulder that abuts against the shoulder 22 on the shaft portion to

limit the outward movement of the cone upon the shaft portion 10. To limit the inward movement of the cone upon the shaft portion, I employ a supplementary tubular sleeve 26, which is provided with an internally-screw-threaded outer end portion 27, adapted to engage with and screw upon the screw-threaded portion 23. This supplementary sleeve 26 is beveled at its inner end 28 to correspond with the reduced inner end of the shaft portion 10, and is of substantially the same circumference as the shaft portion 9. When the supplemental sleeve is secured to the shaft portion 10, the flange or reduced portion 25 of the cone 24 is held between the outer end of the supplemental sleeve and the shoulders 22, and the cone is thereby locked against longitudinal movement upon the shaft without interfering with its free rotation.

The locking-cone in provided with any well-known means for the attachment of a wrench or similar tool for rotating it upon the shaft.

The usual antifriction-balls 29 are interposed between the cones and bearing-cases, and the bearings are also provided with the ball-retainers 30 and felt washers 31.

The device is preferably assembled as follows: The sprocket is screwed upon the screw-threaded portion 13 and firmly against the shoulder 14, and the cone 21 is then firmly screwed partially upon the screw-threaded end of the sleeve 17 and partially upon the screw-threaded portion 13 and firmly against the sprocket. The outer bearing-cases are inserted and screwed into the ends of the hanger, and the balls, ball-retainers, and washers placed in position. The cone 24 is slipped upon the shaft portion 10 and the supplemental sleeve 26 screwed upon the portion 23, the beveled inner end of the sleeve being alined around and with the reduced inner end of the shaft portion 10 to present a reduced end substantially similar to the reduced end of the opposite portion 9. The two portions are then introduced into the hanger, the portion 10 inserted in the sleeve 17, and the cone 24 screwed upon the screw-threaded end of the sleeve to draw and lock the two portions together. Owing to the beveled or inclined form of the end 28 of the supplemental sleeve 26 the sleeve is locked against rotation when the shaft portions are united. By this means the thread of the portion 23 may be either right or left hand, as desired, and the cone 24 is positively locked against any appreciable longitudinal movement along the shaft when the sections are assembled, and the supplemental sleeve and the cone can only be disengaged from their position when the shaft-sections are separated.

The bearings are adjusted in the usual manner by means of the outer bearing-cases.

I claim as my invention—

1. In a divisional crank-shaft, a shaft formed in two sections, having reduced interlocking ends, one section being larger in circumference than the other and provided with a screw-threaded portion near its juncture with its crank, and the other with a shoulder near its juncture with its crank, and a screw-threaded portion at a short distance from the inner side thereof, a sprocket screwed upon the screw-threaded portion of said first section, a tubular sleeve provided with screw-threaded ends, a cone screwed partially upon one of the ends of the tubular sleeve and partially upon the screw-threaded portion of the first shaft-section, a locking-cone adapted to screw upon the end of the sleeve to draw the shaft-sections together and having an interior flange adapted to abut against the shoulder upon the smaller shaft-section, and a supplemental tubular sleeve having an internally-screw-threaded outer end adapted to screw upon the screw-threaded portion of the smaller shaft portion, a beveled inner end corresponding to the reduced end of the smaller shaft portion and its outer end forming a locking-abutment for the locking-cone as set forth.

2. A divisional crank-shaft comprising two sections one larger in circumference than the other, adapted to interlock together to prevent independent rotation, a tubular sleeve secured to the section of larger circumference, a locking-cone for securing the sleeve to the smaller section, and a supplementary tubular sleeve portion of substantially the same circumference as the larger shaft portion adapted to embrace the smaller shaft-section with its inner end formed to correspond to the interlocking end of said shaft portion and its outer end adapted to abut against the locking-cone, thereby forming a locking-abutment to prevent the inward longitudinal movement of the cone upon the shaft, as set forth.

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