

No. 652,972.

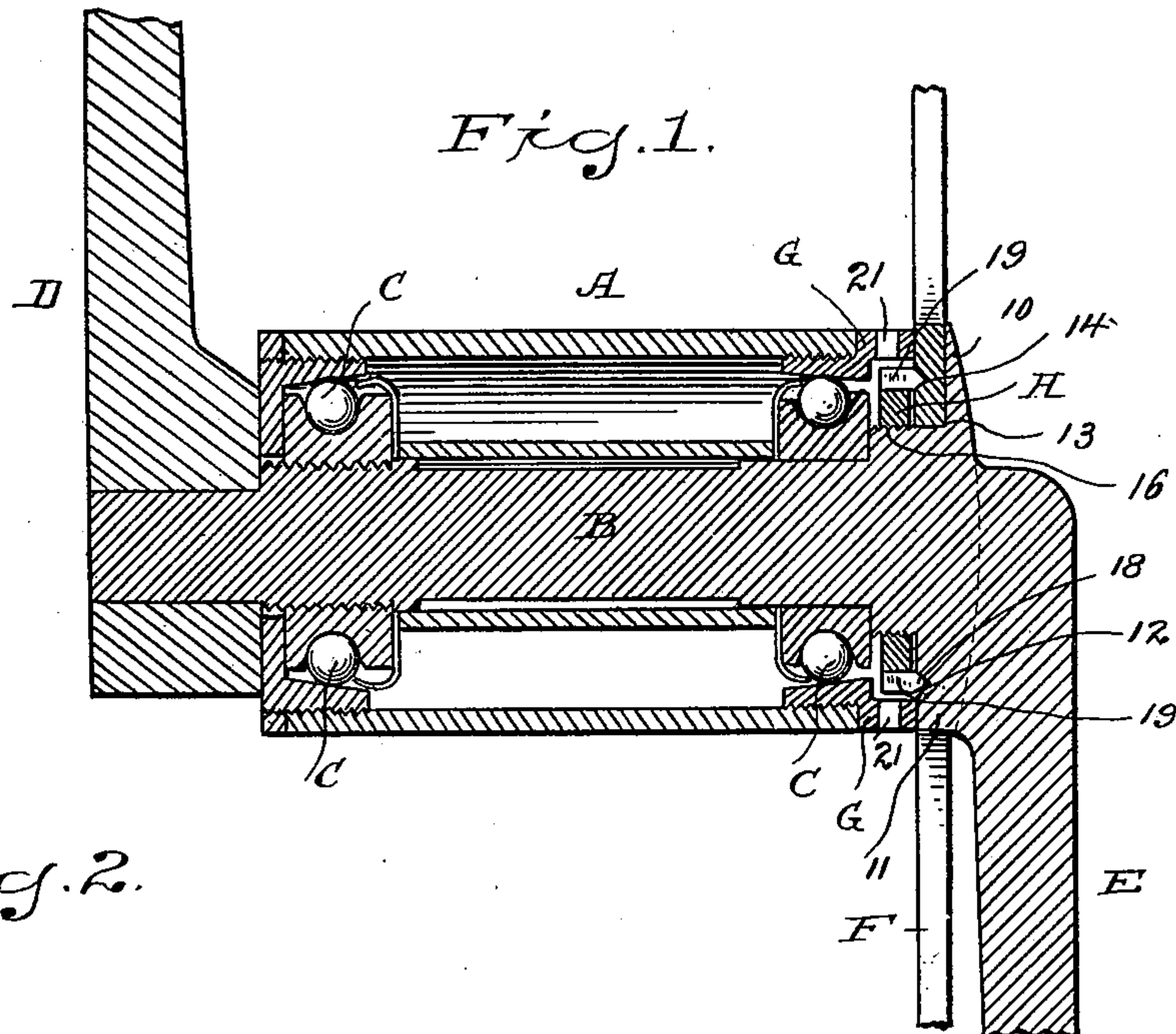
Patented July 3, 1900.

F. W. LUSEBRINK.

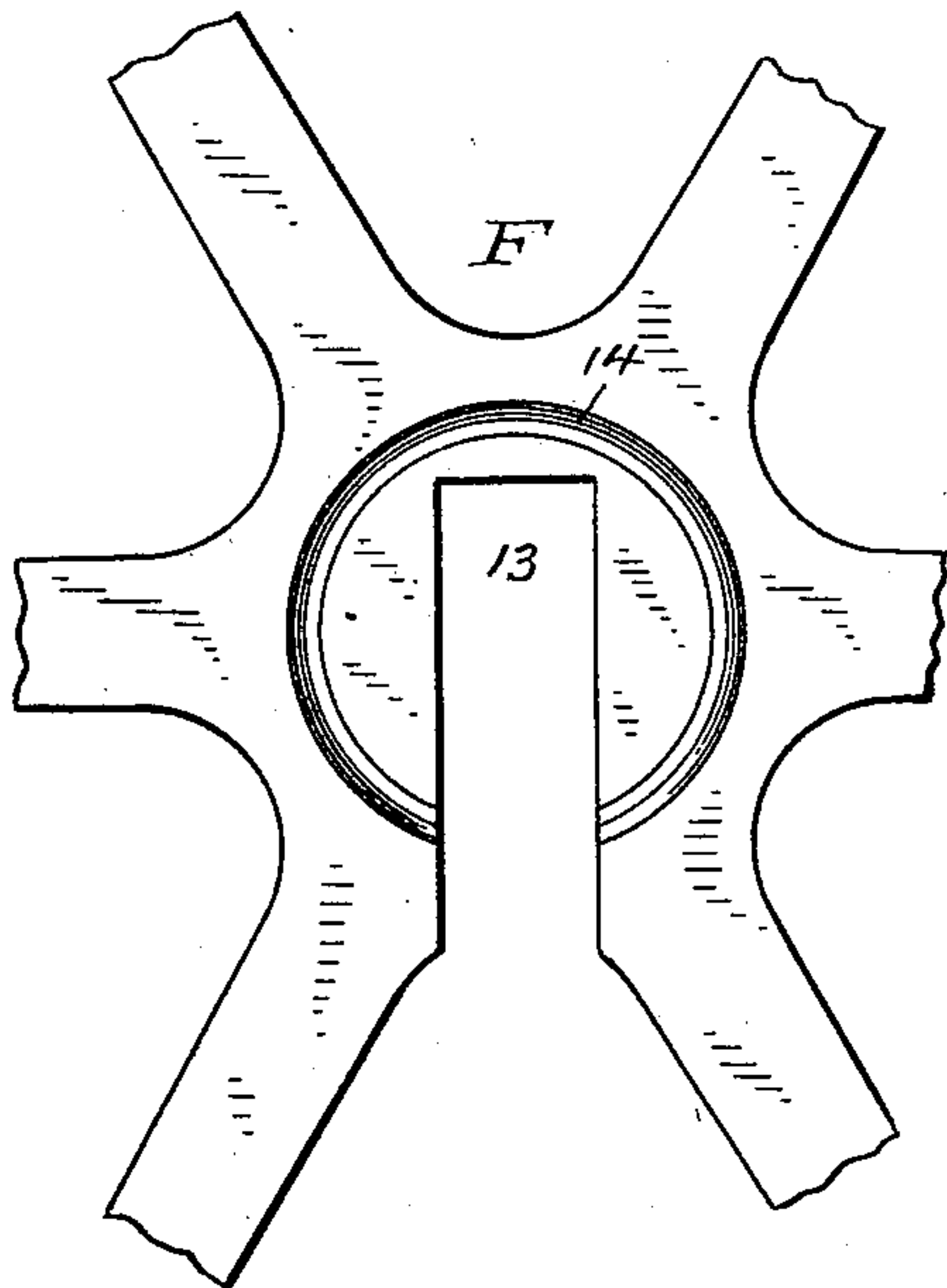
LOCKING DEVICE FOR CYCLE SPROCKET WHEELS.

(Application filed Oct. 16, 1899.)

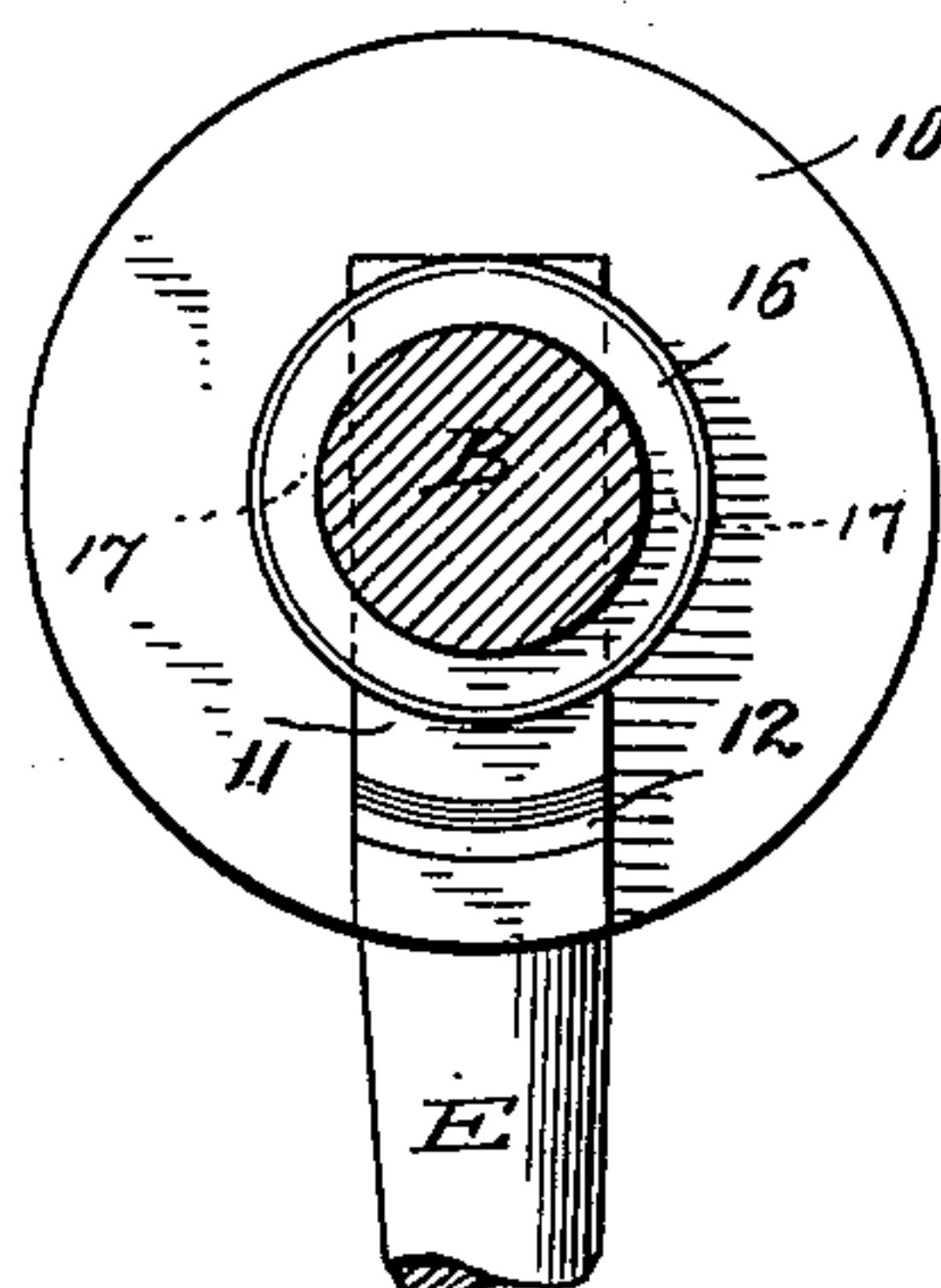
(No Model.)



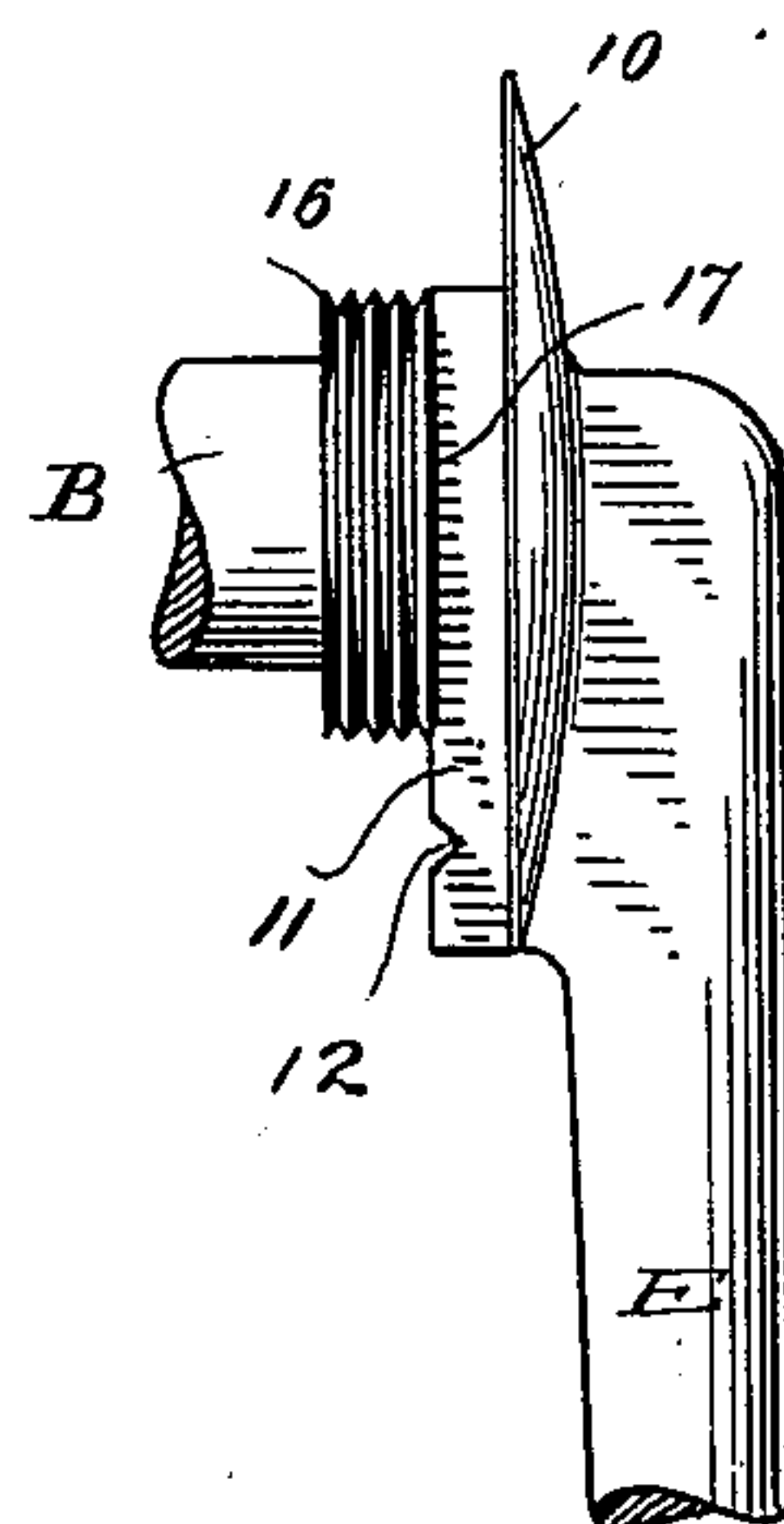
*Fig. 2.*



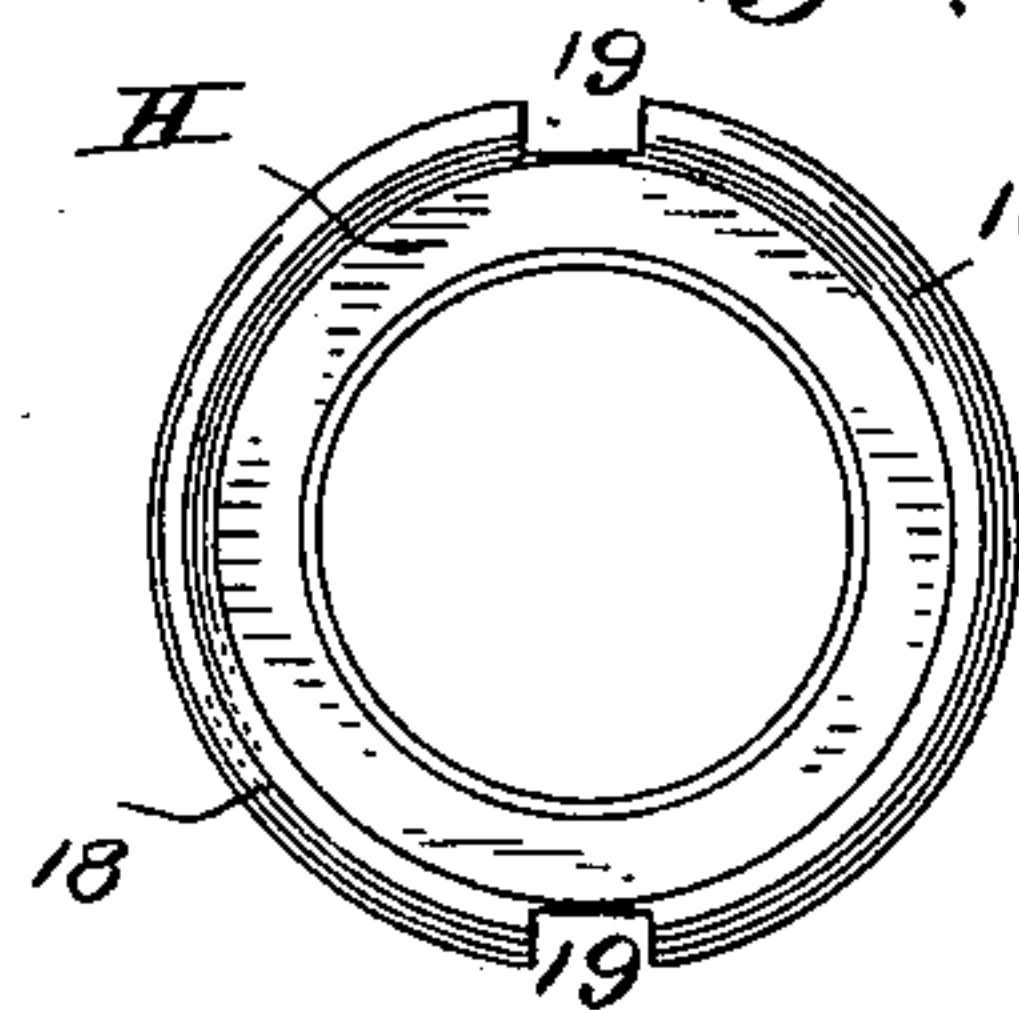
*Fig. 3.*



*Fig. 4.*



*Fig. 5.*



WITNESSES

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# UNITED STATES PATENT OFFICE.

FREDERICK W. LUSEBRINK, OF BRIDGEPORT, CONNECTICUT.

## LOCKING DEVICE FOR CYCLE SPROCKET-WHEELS.

SPECIFICATION forming part of Letters Patent No. 652,972, dated July 3, 1900.

Application filed October 16, 1899. Serial No. 733,701. (No model.)

*To all whom it may concern:*

Be it known that I, FREDERICK W. LUSEBRINK, a citizen of the United States, residing at Bridgeport, county of Fairfield, State of Connecticut, have invented a new and useful Locking Device for Cycle Sprocket-Wheels, of which the following is a specification.

My invention has for its object to provide a device for locking the large sprocket-wheel to the crank-shaft of a cycle in such a manner as to permit the convenient removal of the sprocket-wheel, if desired, without the use of other tools than a nail, but which will hold the sprocket-wheel against the possibility of removal or of its becoming loosened until the locking device is properly manipulated, which will simplify and cheapen the construction of the cycle, will accurately center the sprocket-wheel and the crank-shaft, so as to insure true running of the outside diameter of the sprocket-wheel, will tighten the sprocket-wheel vertically against the crank-shaft flange, and will bind the walls of the slot in the sprocket-wheel tightly against the crank-shaft lug, thereby insuring that the sprocket-wheel will at all times remain absolutely rigid with the crank-shaft.

In order to accomplish the results above stated, and, while greatly improving the efficiency of the cycle, effect a reduction in the cost of construction, I have devised the novel sprocket-wheel-locking device which I will now describe, referring to the accompanying drawings, forming part of this specification, and using reference characters to indicate the several parts.

Figure 1 is a section of the crank-hanger of a cycle, illustrating the operation of my novel locking device; Fig. 2, an elevation of the hub portion of the large sprocket-wheel of a cycle; Fig. 3, an inner face view of the right crank and the crank-shaft flange and crank-shaft lug, the crank-shaft being in section; Fig. 4, a side elevation corresponding therewith, and Fig. 5 is a face view of the locking-collar detached.

A denotes the crank-hanger, B the crank-shaft, C the ball-bearings, D the left crank, E the right crank, F the large sprocket-wheel, and G the right bracket-cup, of the well-known Liberty cycle. I wish it distinctly understood, however, that my invention is

not restricted in its application to this make of cycle, but is equally adapted to other makes and styles of chain-cycles.

At one end of the crank-shaft—in the present instance the right end—is a flange commonly known as the “crank-shaft” flange and which I have indicated in the drawings by 10, and on the inner face of this flange is a lug commonly known as the “crank-shaft” lug and which I have indicated in the drawings by 11. Upon the inner face of the crank-shaft lug is an arc-shaped clearance-groove 12, the purpose of which I shall presently explain.

16 denotes a threaded circular enlargement of the crank-shaft just within the crank-shaft lug. As the diameter of this enlargement is greater than the width of the crank-shaft lug, it follows that there will be recesses at the sides of the crank-shaft lug and between the crank-shaft flange and the enlargement. These recesses I have indicated by 17. The hub portion of the large sprocket-wheel is provided with a slot 13, which just receives crank-shaft lug 11, and with a circular groove 14, which is adapted to register with a clearance-groove in the crank-shaft lug. Groove 14 and the clearance-groove are shown as V-shaped in cross-section. The two grooves together complete a circle.

H denotes my novel locking-collar, which is interiorly threaded to engage the external thread of enlargement 16 and is provided with a circular flange 18, extending laterally therefrom, which is adapted to impinge upon the inner face of groove 14 in the face of the sprocket-wheel and to lie in the clearance-groove.

19 denotes recesses in the periphery of the locking-collar, which are adapted to receive a nail or other implement to be used as a key, as will be more fully explained, and 21 denotes the usual pin or spanner holes in bracket-cup G.

The operation of my novel locking device is as follows: Suppose that it is desired to remove the large sprocket-wheel of a cycle at any time or for any purpose. The operator inserts an implement to serve as a key—as, for example, a suitable pin, or, if nothing better offers, a one-eighth wire nail—through one



of the holes in the bracket-cup and, if necessary, moves the latter slightly until the key will engage one of the recesses 19 in the periphery of the locking-collar. Having engaged both bracket-cup and locking-collar with the key, the operator turns the crank-shaft backward, the action of which through the threaded engagement of the locking-collar with enlargement 16 on the crank-shaft is to move the locking-collar inward on the enlargement, and consequently to draw flange 18 entirely out of grooves 12 and 14 in the crank-shaft lug and the sprocket-wheel. As soon as the flange has been removed from these grooves the sprocket-wheel will be wholly free and may be removed from the crank-shaft with ease. In returning the sprocket-wheel to place it is slipped over the crank-shaft, slot 13 in the sprocket-wheel receiving the crank-shaft lug and the hub portion of the sprocket-wheel filling the recesses 17 between the crank-shaft flange and the enlargement. The operator then passes a pin, nail, or other implement serving as a key through one of the holes 21 in the bracket-cup and engages it with one of the recesses in the periphery of the locking-collar, after which, holding the key stationary, the operator turns the crank-shaft forward again, which causes the locking-collar to move outward on the threaded enlargement on the crank-shaft, flange 18 on the locking-collar engaging the inner face of the groove in the sprocket-wheel and also entering the clearance-groove, and thereby locking the parts firmly together. The effect of the engagement of flange 18 upon the locking-collar with the inner face of groove 14 is not only to press the sprocket-wheel tightly against the crank-shaft flange, but also to close the walls of slot 13 upon the crank-shaft lug, so as to hold the sprocket-wheel rigidly in place and render it impossible for it to become loose, and, what is an exceedingly-important result, it also centers the sprocket-wheel and crank-shaft relatively to each other, and thus insures perfect running of the outside diameter of the sprocket-wheel in use.

Having thus described my invention, I claim—

1. In a cycle the combination with a crank-shaft having a crank-shaft flange, a crank-shaft lug and a threaded enlargement, of a sprocket-wheel having a slot adapted to receive the crank-shaft lug, said sprocket-wheel and said lug being provided on their inner faces with grooves which together form a circle and a locking-collar threaded to en-

gage the enlargement and having a laterally-extending flange adapted to engage the grooves, so that when the locking-collar is turned outward on the crank-shaft the sprocket-wheel will be clamped between the locking-collar and the crank-shaft flange, the walls of the slot will be caused to clamp the crank-shaft lug and the sprocket-wheel will be centered upon the crank-shaft.

2. In a cycle the combination with a crank-shaft having a crank-shaft flange, a crank-shaft lug and a threaded enlargement, of a sprocket-wheel having a slot adapted to receive the crank-shaft lug, said sprocket-wheel and said lug being provided on their inner faces with grooves which together form a circle, a locking-collar threaded to engage the enlargement and having a laterally-extending flange adapted to engage the grooves, and recesses 19 in its periphery, and a bracket-cup having holes 21 so that when a suitable key is passed through one of the holes 21 and engaged with one of the recesses 20 rotation of the crank-shaft will move the locking-collar in either direction as may be required.

3. In a cycle the combination with a crank-shaft and crank-shaft lug, of a sprocket-wheel having a slot which receives the lug and on its inner face a circular groove and a locking-collar having a laterally-extending flange adapted to engage the inner face of the groove so that when the locking-collar is moved outward on the crank-shaft the walls of the slot are caused to clamp the lug and the sprocket-wheel is centered on the crank-shaft.

4. The locking-collar II having laterally-extending flange 18 and recesses 19 in its periphery substantially as shown, for the purpose specified.

5. The crank-shaft B having crank-shaft flange 10, crank-shaft lug 11 having clearance-groove 12; and threaded enlargement 16, said lug extending from the periphery of the enlargement substantially as shown, for the purpose specified.

6. The sprocket-wheel F having slot 13, and circular groove 14 substantially as shown, for the purpose specified.

In testimony whereof I affix my signature in presence of two witnesses.

FREDERICK W. LUSEBRINK.

Witnesses:

A. M. WOOSTER,  
S. W. ATHERTON.