No. 611,750. Patented Oct. 4, 1898.

J. W. FULFORD.

BICYCLE CHAIN AND SPROCKET GUARD.

(Application filed Dec. 27, 1897.)

(No Model.)

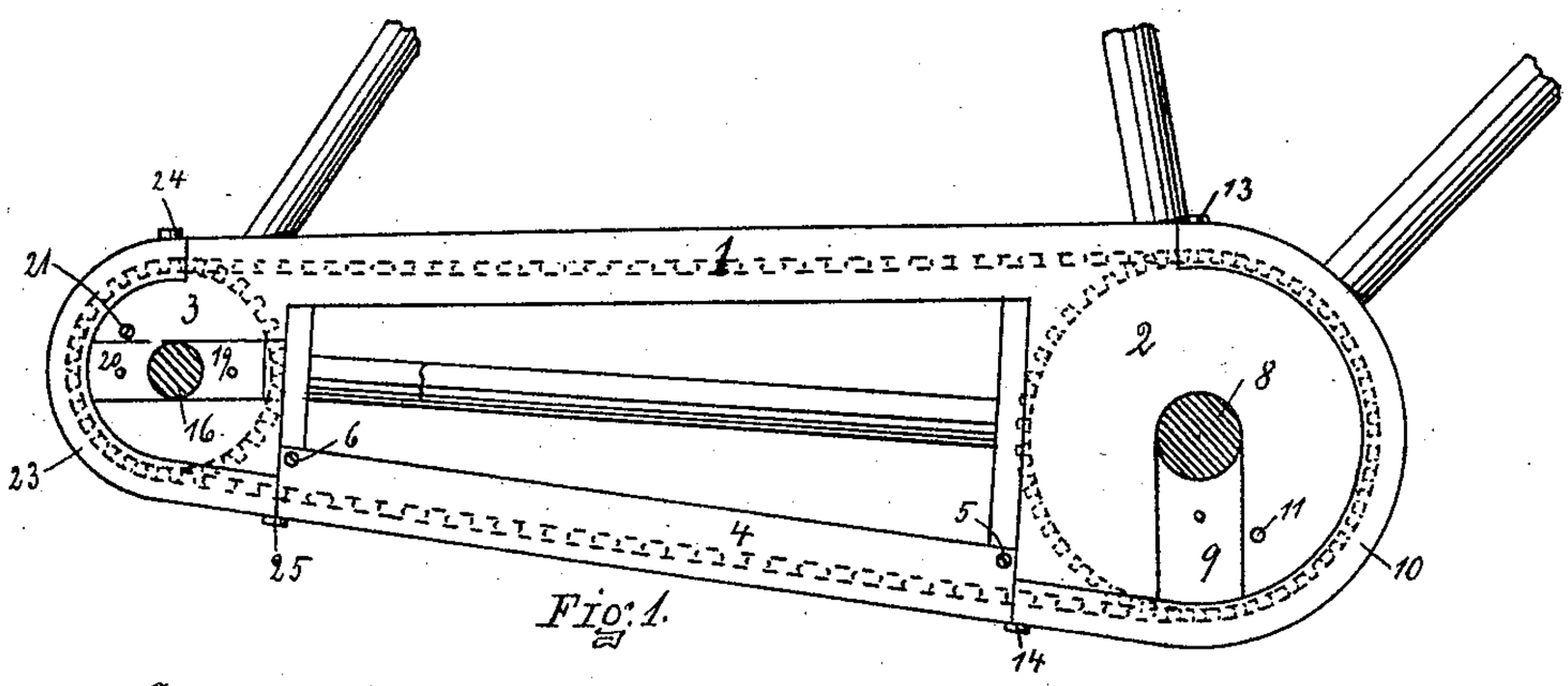

Fig. 1.

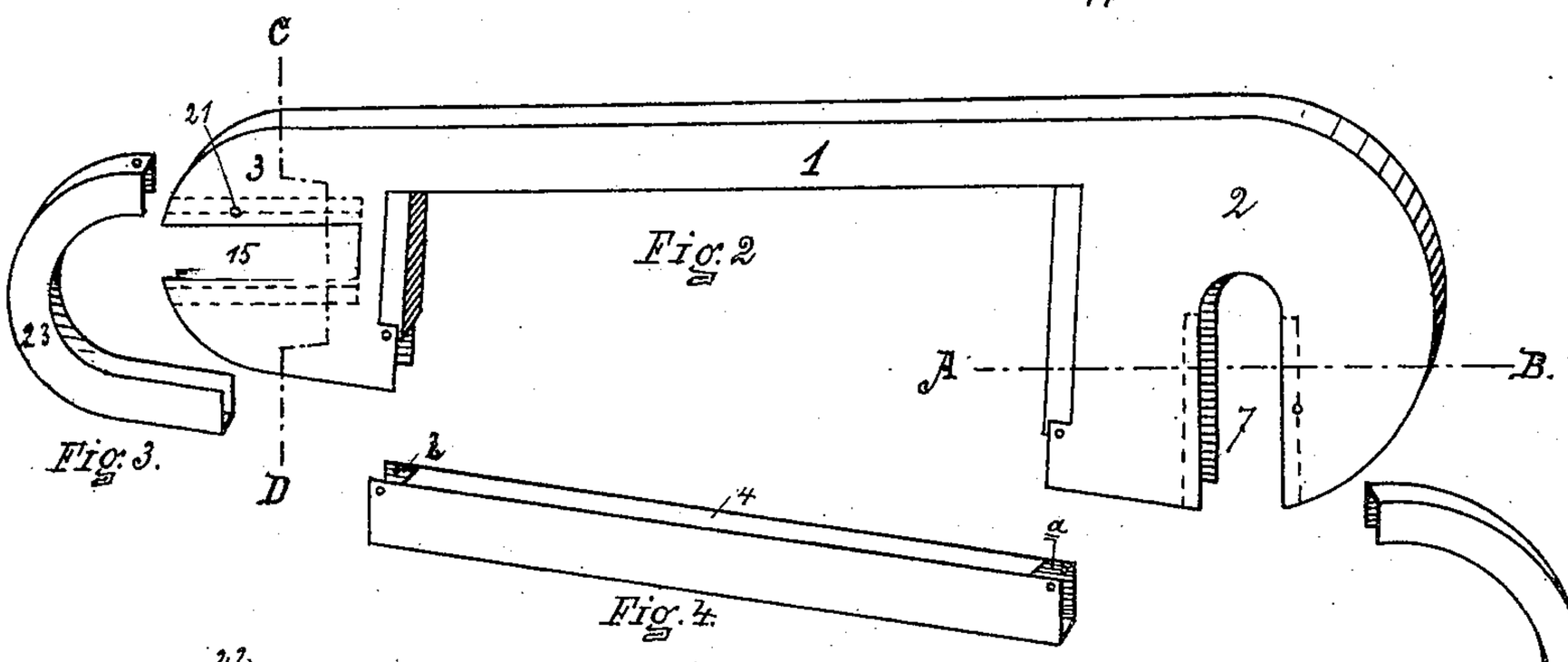

Fig. 2.

Fig. 3.

Fig. 4.

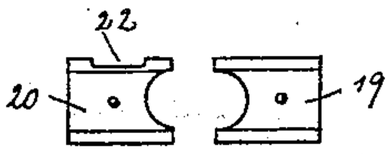

Fig. 5. Fig. 6.

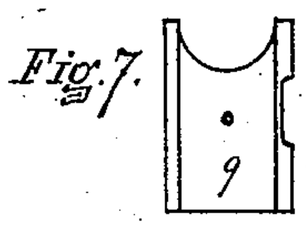

Fig. 7.

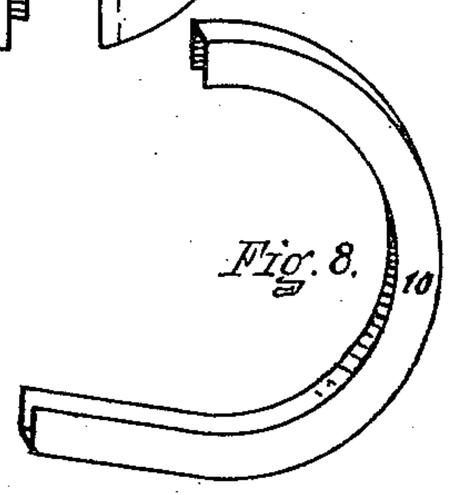

Fig. 8.

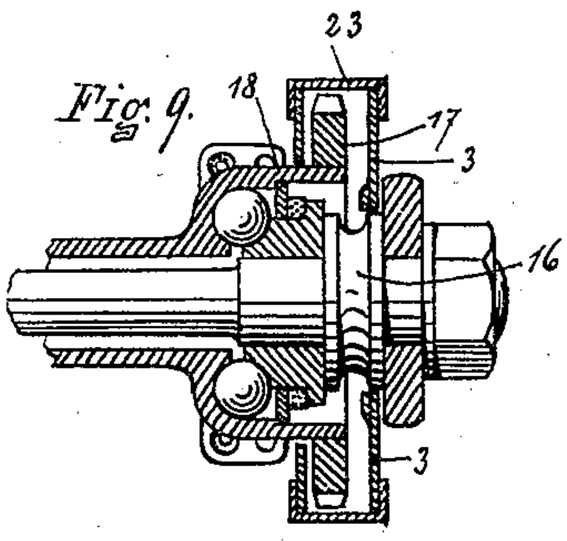

Fig. 9.

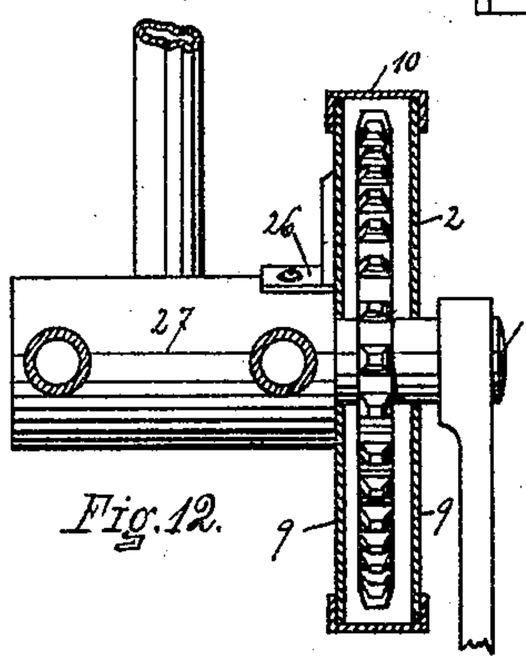

Fig. 12.

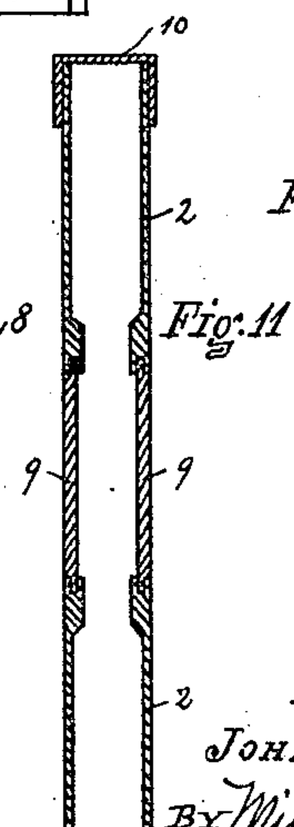

Fig. 11.

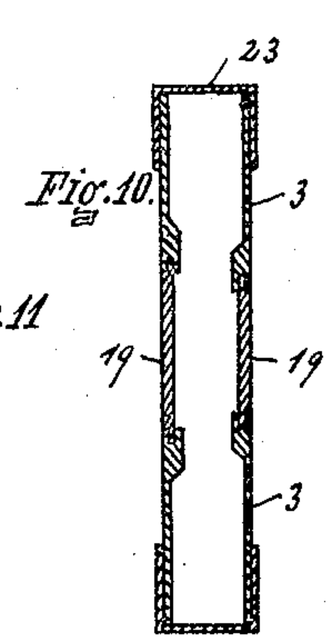

Fig. 10.

WITNESSES.
Rich. A. George.
Phebe A. Tanner

INVENTOR
JOHN W. FULFORD
BY Milton E. Robinson
ATTORNEY.

UNITED STATES PATENT OFFICE.

JOHN W. FULFORD, OF UTICA, NEW YORK, ASSIGNOR TO THE FULFORD GEAR-CASE COMPANY, OF SAME PLACE.

BICYCLE CHAIN AND SPROCKET GUARD.

SPECIFICATION forming part of Letters Patent No. 611,750, dated October 4, 1898.

Application filed December 27, 1897. Serial No. 663,466. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. FULFORD, of Utica, in the county of Oneida and State of New York, have invented certain new and useful Improvements in Bicycle Chain and Sprocket Guards; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form part of this specification.

Figure 1 shows a side elevation of my improved bicycle chain and sprocket guard in connection with portions of the bicycle-frame and in position for use. Fig. 2 shows the main portion of the guard with all detachable portions removed. Fig. 3 shows the rear end closure. Fig. 4 shows a perspective view of the removable lower tubular side. Figs. 5 and 6 show sliding covers adapted to fill the slot on either side of the rear axle and hub. Fig. 7 shows a sliding cover adapted to close the slotted opening below the pedal-shaft at the forward end of the device. Fig. 8 shows an end closure for the larger or forward end of the guard. Fig. 9 shows a vertical section of a portion of the rear hub and bearing, including the rear driving-sprocket, and showing the guard in position thereon. Fig. 10 shows, on an enlarged scale, a section taken on line C D of Fig. 2. Fig. 11 shows a section on A B of Fig. 2. Fig. 12 shows a cross-section of the guard at the forward end in connection with the crank-shaft and forward driving-sprocket and portions of the bicycle-frame.

Referring to the reference letters and figures in a more particular description of the device, 1 indicates the upper tubular portion of the guard, adapted to afford a passage for the sprocket-chain and having rigidly secured at one end the enlargement 2, adapted to afford a housing for the driving-sprocket, and on the other end a smaller housing 3, adapted to receive the rear-wheel sprocket. Between the lower portions of the enlargements or housings 2 and 3 there is secured a removable tubular portion 4 of the guard. This portion is adapted to afford a passage for the sprocket-chain and is provided with a cut-away portion in its upper wall, as shown at *a* and *b*, at either end, whereby the same may be slipped on from the lower side, the projecting walls 2 and 3 receiving the lower corners of these walls, as shown, and the tube 4 is secured in place by the screws 5 and 6, passing transversely through the guard and tube above the line of travel of the lower portion of the sprocket-chain. The housing portion 2 is provided in its opposite walls with corresponding vertical slots 7, rounded at their upper ends to fit the shaft and bearing. This enables the front end to be placed over the crank-shaft in applying the guard to a machine, and the lower portion of the slot below the crank-shaft 8 is closed by the removable slide 9, running in ways, as shown particularly in Fig. 11.

Of course it will be understood that the slide 9 is provided on each side of the housing 2 in the corresponding slots 7. The slides 9 are secured in position and from jarring out of position by a set-screw 11, which when tightened clamps the two parts of the slide-guide and binds the slide. The screw also passes through the way portion 12 on the side of the slide and prevents the same from being entirely removed until the screw has been entirely removed. The end of the housing 2 which is otherwise open is closed by the circular end piece or closure 10, which is secured by a screw 13 on the upper side and a screw 14 on the under side. The closures or covering-pieces 10 are applied after the slides 9 are in position and also serve to prevent the slides from being lost or dropped out. The length of the slide, however, is such as to allow of some adjustment when the closure 10 is applied, as will be seen by the partial dotted outline in Fig. 1. The corresponding slots 15 in the rear housing 3 are adapted to receive the rear shaft 16 and a portion of the rear hub—that is, the slot on one side may be narrow, as shown in Fig. 9, to receive the stationary or fixed portion 16 of the rear shaft, while the other side of the housing may be cut out in an enlarged slot to receive the end of the wheel-hub 18. In the construction as shown in Fig. 9, 17 indicates the rear sprocket, which is secured on the end

of the hub 18. These slots being in a horizontal position, as shown, permit the lateral adjustment of the rear shaft 16, whereby the tension of the chain may be regulated. The slots 15 on either side of the rear shaft are closed by sliding plates 19 and 20. These plates are mounted in slides or ways, as shown in cross-section in Fig. 10, and the rear slide 20 is secured by the binding action of the set-screw 21. This set-screw also passes through the cut-away portion 22 in the side of the slide, preventing it being entirely removed until the screw 21 has been entirely removed. The slides 19 and 20 are of less total length, including the shaft 16, than the length of the slot 15, whereby provision is made for the adjustment of the tension of the chain.

The end of the housing 3 which is otherwise open is closed by a curved flanged cover or closure 23. This cover or closure is secured in position by a screw 24 at its upper end and a screw 25 at its lower end. The arrangement of the slides 20 is such that some movement is allowed between its end and the closure 23, as shown by partial dotted outlines in Fig. 1. The rear end of the guard is supported and held by resting on the stationary shaft 16, as shown in Fig. 9. The forward portion of the guard is supported by one or more projecting ears 26, secured on the inner side of the housing 2 and secured to the frame enlargement 27, which receives the crank-shaft and bearings.

In applying the guard to a bicycle the lower tube 4 is removed, together with the end closures 10 and 23 and the slides 9 and 20. The sprocket-chain is also separated and one end is passed through the upper tubular portion 1 of the guard. The guard is then brought into position on the wheel, with the driving-shaft 8 being passed in through the slot 7 and the rear-wheel shaft being passed into the slot 15. The chain is then passed around the forward sprocket, which may be readily done when the closure 10 is removed, and thence through the tubular portion 4, before it is brought into position. The tubular portion 4 is then placed in position on the main body of the device and the end of the chain passed onto the rear sprocket, where the two ends may be brought together at the end of the slot 15 and the connecting screw or pin placed in position. The slides 9 and 20 are then placed and secured and the closures 10 and 23 placed in position and secured. The screws which secure the removable tube 4 are then placed in position also, when the device is completely applied. It will be noted that when applied to a bicycle one of the lower frame-bars passes diagonally through the opening between the upper tubular portion 1 and the removable tube 4.

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

1. In a bicycle chain and sprocket guard the combination of the tubular portion 1, of the fixed housings 2 and 3 and removable tubular portion 4 constructed and arranged to take a position between the housings 2 and 3 substantially as set forth.

2. The combination in a bicycle chain and sprocket guard of the tubular portion 1 having the fixed housings 2 and 3, the removable tubular portion 4 and the end closures 10 and 23, substantially as set forth.

3. The combination in a bicycle chain and sprocket guard, of the tubular portion 1 having fixed housings 2 and 3, the vertical slots and closing slides 9 in the housing 2, the horizontal slots and closing slides in the housing 3, the removable tube 4 and the end closures 10 and 23, substantially as set forth.

In witness whereof I have affixed my signature, in presence of two witnesses, this 22d day of December, 1897.

JOHN W. FULFORD.

Witnesses:
E. W. JONES,
H. D. HOLBUSH.