(No Model.)

# C. E. SWAN.

## ELASTIC WASHER.

No. 454,085. Patented June 16, 1891.

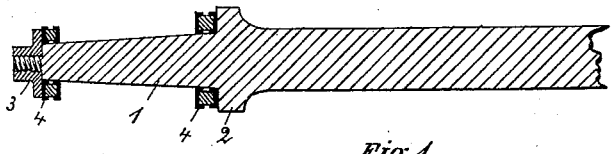


Fig. 1.

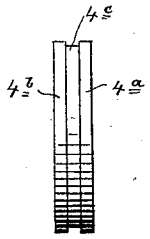


Fig. 2.

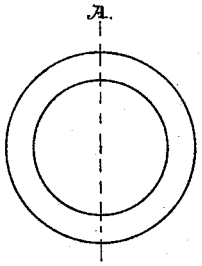


Fig. 3.

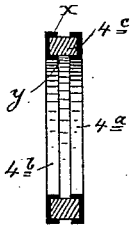


Fig. 4.

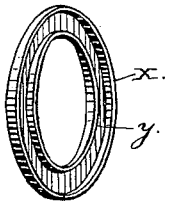


Fig. 5.

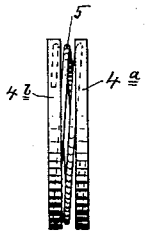


Fig. 7.

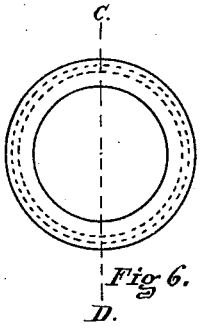


Fig. 6.

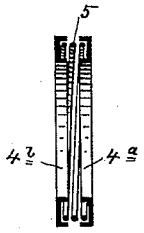


Fig. 8.


Fig. 9.

WITNESSES.

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# UNITED STATES PATENT OFFICE.

CHARLES E. SWAN, OF ROME, NEW YORK, ASSIGNOR OF ONE-HALF TO ISAAC J. EVANS, OF SAME PLACE.

## ELASTIC WASHER.

SPECIFICATION forming part of Letters Patent No. 454,085, dated June 16, 1891.

Application filed October 25, 1890. Serial No. 369,279. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES E. SWAN, of Rome, in the county of Oneida and State of New York, have invented certain new and useful Improvements in Elastic Washers; 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.

My invention relates to an elastic washer, especially designed for use upon the axle-bearings of the wheels of vehicles.

In the drawings which accompany and form a part of this specification, and in which similar letters and numerals of reference refer to corresponding parts in the several figures, Figure 1 shows a longitudinal section of an axle having my improved washers applied thereon. Fig. 2 shows an edge view of my improved washer. Fig. 3 shows a plan view of the same. Fig. 4 shows a cross-section taken on line A B of Fig. 3. Fig. 5 shows the inner face of one of the outer plates of the washer in perspective. Fig. 6 shows a modified form of construction in which the spring is used. Fig. 7 shows an edge view of the construction shown in Fig. 6. Fig. 8 shows a cross-section on line C D of Fig. 6. Fig. 9 shows a modified form of construction from that shown in Fig. 4, and taken substantially as Fig. 4 is taken.

Referring more specifically to the reference numerals marked on the drawings, 1 indicates the axle-bearing having shoulder 2 and retaining-nut 3.

4 4 indicate my improved washers applied to the axle-bearing, one on each side of the box, although only one washer for the one side may be used.

Referring to Fig. 2, $4^a$ and $4^b$ are plates, preferably of brass, having inwardly-projecting flanges $x$ and $y$, Fig. 5, which flanges receive and retain an elastic washer or cushion $4^c$.

In the modified form of construction shown in Fig. 9 the flange $y$ of the part $4^b$ is adapted to engage inside of the flange $y$ of the part $4^a$, thus closing the opening between the elastic washer or cushion $4^c$ and the axle-bearing from the way it is shown in Fig. 4.

In Figs. 6, 7, and 8, spring 5 is used in lieu of the rubber washer or cushion $4^c$, and after making one or two convolutions between the plates $4^b$ and $4^a$ is secured at or near its respective ends to each.

It is evident that the plates $4^b$ and $4^a$ may be provided with flanges, as shown in Fig. 9, when used in connection with the spring, as well as with the elastic washer, and that other variations or modifications in and from the construction shown and described may be made without departing from the spirit of my invention.

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

1. The combination of a carriage-axle, a wheel-box, and elastic washer having outer wearing-faces $4^a$ and $4^b$, each having inwardly-extending flanges $x$ around the periphery and inwardly-extending flanges $y$ around the opening through the washer, and an elastic spring or cushion between the faces within the flanges $x$ and $y$ and secured to each face, as set forth.

2. As a new article of manufacture, an elastic washer having in combination outer metal faces $4^a$ and $4^b$, with inwardly-projecting retaining-flanges $x$ and $y$, the opening through the face $4^b$ being of smaller diameter and the flange $y$ therein telescoping within the flange $y$ of the opposite face-piece $4^a$, and an elastic spring or cushion between the face-pieces and inclosed within the flanges $x$ and $y$ and secured to each, substantially as set forth.

3. The combination of a carriage-axle, a wheel-box, and elastic washer having outer wearing-faces $4^a$ and $4^b$, each having inwardly-extending flanges $x$ around the periphery and inwardly-extending telescoping flanges $y$ around the opening through the washer, and an elastic spring or cushion between the faces within the flanges $x$ and $y$ and secured to each, as set forth.

In witness whereof I have affixed my signature in presence of two witnesses.

CHARLES E. SWAN.

Witnesses:

J. W. ARMSTRONG,

C. WILLIAM C. WHEELER.