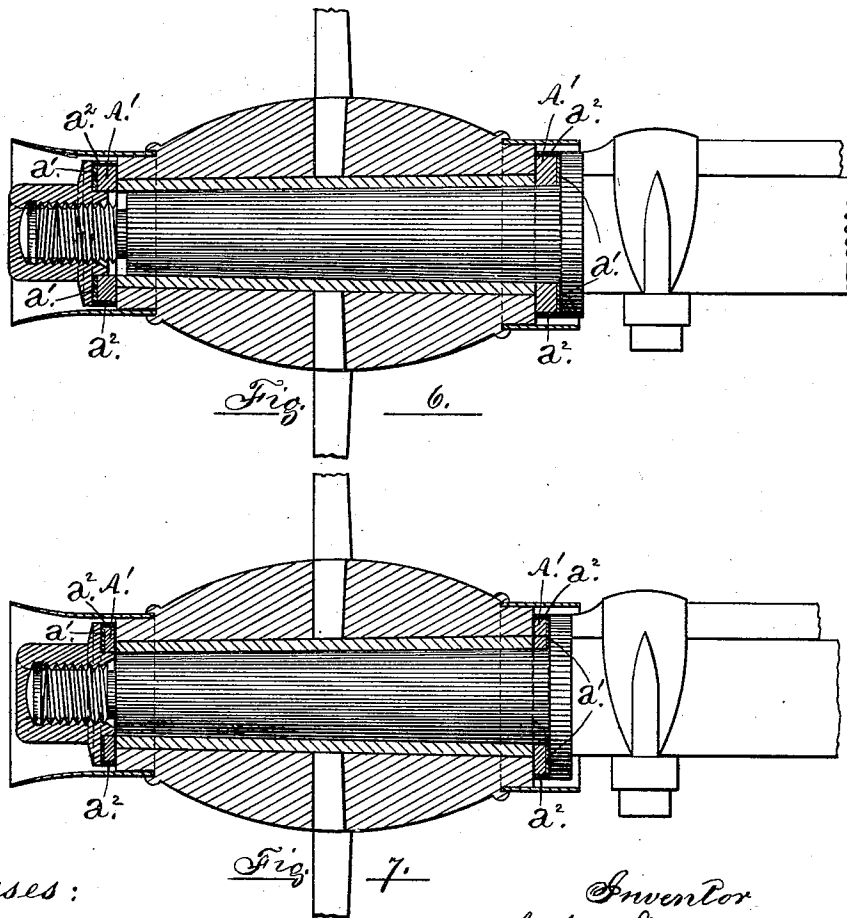
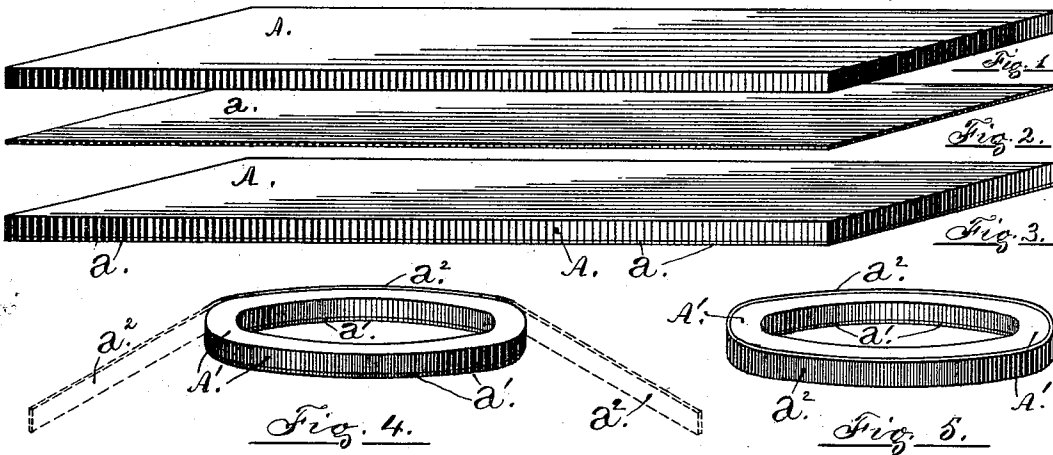


(No Model.)

A. W. WOODWARD.
AXLE WASHER FOR VEHICLES.

No. 507,868.

Patented Oct. 31, 1893.



Witnesses:

Edwin Bookmyer
Frank L. Urban.

Inventor
Ambrose W. Woodward.

By Daniel H. Carr,
Attorney.

UNITED STATES PATENT OFFICE.

AMBROSE WEBSTER WOODWARD, OF LANCASTER, PENNSYLVANIA.

AXLE-WASHER FOR VEHICLES.

SPECIFICATION forming part of Letters Patent No. 507,868, dated October 31, 1893.

Application filed January 26, 1893. Serial No. 459,802. (No model.) Patented in Canada November 8, 1892, No. 40,944; in England February 16, 1893, No. 3,460; in Belgium February 17, 1893, No. 103,487; in France February 17, 1893, No. 228,002, and in Italy March 31, 1893, XXVII, 33,815, LXVI, 226.

To all whom it may concern:

Be it known that I, AMBROSE WEBSTER WOODWARD, a citizen of the United States, residing at Lancaster, in the county of Lancaster and State of Pennsylvania, have invented certain new and useful Improvements in Cork Axle-Washers for Vehicle-Wheels, (patented as follows: in Great Britain February 16, 1893, No. 3,460; in Belgium, No. 103,487, dated February 17, 1893; in France, No. 228,002, dated February 17, 1893; in Italy, R. G. Vol. XXVII, No. 33,815, R. A. Vol. LXVI, No. 226, dated March 31, 1893, and in Canada, No. 40,944, dated November 8, 1892;) and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The invention relates to improvements in axle or spindle washers for vehicle wheels, of that class in which rings or gaskets cut from selected cork are adapted to be placed on the axle spindles between the rear ends of the wheel hubs and the shoulders of said spindles, as well as between the front ends of said hubs and the spindle nuts.

The invention consists, first, in cutting from selected cork blocks, rectangular pieces having the required thickness and width; second, in fixing rigidly to one side of said pieces, a thin facing of any suitable material; third, in cutting from these prepared pieces, the required rings, gaskets, or washers; and fourth, in applying to the peripheral edges of said washers, bands of any suitable material, to give them additional strength.

The object of the invention is to provide compressible cushions between the front and rear ends of vehicle wheel hubs turning on axle spindles and the shoulders and axle-nuts, respectively, at the rear and front ends of said spindles, to take up any lost motion, endwise, of said hubs and not interfere with the free turning of said wheels. To stop the rattling, clattering or knocking, so extremely annoying, of vehicle wheels having too much space, endwise, on their spindles, washers made of metal, leather, rawhide, paper, or wood, have heretofore been in use, but these do not an-

swer the purpose as well as the washers which are the subject of the present application. All of the foregoing are too solid, hard or compact, and not compressible enough. With them it is quite an easy matter, in washing, to get the wheels too tight on their spindles and thus interfere much with their easy turning, making the vehicles to run hard or heavy, and, besides, they all contain more or less grit, or cutting particles, which wear into the bodies between which they are placed.

The purposes of the invention are attained by the devices illustrated in the accompanying drawings in which similar letters refer to like parts throughout the several views, and in which—

Figure 1 is a perspective view of a rectangular pad cut from a block of approved cork; Fig. 2, a similar view of a rectangular sheet of approved material to be secured to one side of said pad, or piece, of cork; Fig. 3, a similar view of Figs. 1 and 2 secured together, the cork being above, and the face-lining, below; Fig. 4, a similar view of a ring or gasket cut from Fig. 3, full lines, above, showing a peripheral band in place, and dotted lines, the extremities of said band, downwardly and outwardly, extended; Fig. 5, a similar view of the washer, completed; Fig. 6, a vertical longitudinal section of a vehicle wheel hub on its axle spindle, showing a section of the washer in place, as first applied, at each end of said hub, and the axle-nut loose on the front end of said spindle; and Fig. 7, a similar view, showing the spindle nut screwed home, and the washer sections compressed.

Rectangular pieces or strips, A, Fig. 1, are cut from approved blocks or sheets of selected bark of the cork-oak (*Quercus suber*), well known to the trade, after having been thoroughly steamed and flattened. Thin sheets, a, Fig. 2, of paper, muslin, leather, or of any other approved material, are then securely attached to one side of said strips by means of any tenacious glue, or such as may be made by heating caoutchouc, coal-tar, and shellac together, to form pads, Fig. 3, from which the washer-gaskets are cut. These pads may be separately manufactured as an article of com-

merce, but they constitute the base of this invention, and may have any desired thickness, which should never be less than about twice the space the washer is intended to fill.

5 In Fig. 4 is shown a ring or gasket, A', cut from the pad illustrated in Fig. 3, a' being the face-lining on its under side; a² indicates a peripheral band of any approved material, full lines above, showing it secured in place,
10 as by gluing, and dotted lines, its extremities, downwardly and outwardly, extended; while, in Fig. 5, the washer is shown to be completed, the peripheral band having been secured the whole way around. Instead of this band, a
15 wire ring, or a tire of thin and very narrow strap metal, of diameter a little less than the outside diameter of the gasket, may be applied to the periphery thereof, the pliability of the cork allowing the gasket to be pressed
20 thereinto, and not involve any new invention. A similar band, or lining, may also be placed on the inner, or concaved, edge of the ring, and not involve any new invention; and, the side facing, together with these bands,
25 may likewise be omitted, without changing the character of the washer, or materially detract from the purposes of the invention. These constructions are so evident that their separate illustration is deemed superfluous.
30 Of course, the washers should have different diameters, as they are to be applied to the front and rear ends of the wheel-hubs, and they should fit closely to the axle spindles.

In Fig. 6, sections of the washer, illustrated
35 in Fig. 5, are shown in place at the front and rear ends of a wheel-hub on its spindle, the washers having the cork portions next to said hub, and the nut, loosely screwed, on the front end of said spindle, while in Fig. 7,
40 said nut is shown screwed home, and the washers, compressed. It will here be observed that the washers have their lined sides next to the spindle shoulder and the flange of the spindle nut. This is so, in order to let the
45 body of the cork yield to the revolving wheel-hub, the full benefit of its cushioning quality, and that the facing against the shoulder and nut, may help to keep the washers stationary; also, should the washers be steeped
50 in oil, or soaked in some other grease, for some time before being used, they will absorb enough greasy matter which they will exude sufficiently, on being compressed, to slightly lubricate the rubbing faces of the
55 hubs, and help to keep their spindles moist; and again, the washers having been compressed, as shown in Fig. 7, should there occur any lost motion, endwise of the hub, the natural elasticity of the cork, or the swelling
60 property thereof, will cause the washers to

expand and gradually fill the space, when said compression is removed, or as when a spindle nut has become slightly loosened.

I am aware that the United States Patent, Reissue No. 5,422, dated May 20, 1873, was granted to Edmund S. Hanna, for an improvement in paper washers; that the United States Patent No. 148,506, dated March 10, 1874, was granted to Cyrus W. Saladee, for an improvement in wooden washers for vehicle-axles; that the United States Patent No. 451,008, dated April 21, 1891, was granted to John T. Smith, for improvements in packing; and also, that the United States Patent No. 63,073, dated March 19, 1867, was granted to James P. McLean, for an improvement in packing for man-holes of steam generators. I, therefore, do not lay any claims broadly to the washer, its shape or form, nor to the washing of vehicle wheels.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. In a washer for vehicle wheels, a gasket made of cork, a face lining rigidly secured to one side, and a tire around the periphery thereof, substantially as described.

2. The combination in a washer for vehicle wheels, with a gasket made of cork as described, of a tire or band secured to the periphery thereof, substantially as and for the purpose set forth.

3. The washer, A', for vehicle wheels, comprising a ring or gasket of cork, having the face-lining, a', rigidly secured to one side thereof, substantially as and for the purpose hereinbefore set forth.

4. The washer, A', for vehicle wheels, comprising the ring or gasket made of cork having the side-facing, a', rigid therewith, and the band, a², secured to the peripheral edge thereof, substantially as described and for the purpose hereinbefore set forth.

5. The combination in an axle-washer for vehicle wheels and the like, with a ring or gasket made of cork, having the facing, a', secured to a side of said gasket, and the band, a², secured to the periphery thereof, of a similar band, rigidly secured to the concaved, inner edge of said ring, substantially as described and for the purpose hereinbefore set forth.

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

AMBROSE WEBSTER WOODWARD.

Witnesses:

DANL. H. HERR,
EDWIN BOOKMYER.