D. DALZELL.

Spring-Washer for Vehicle-Axles.

No. 216,512. Patented June 17, 1879.

Fig. 1.

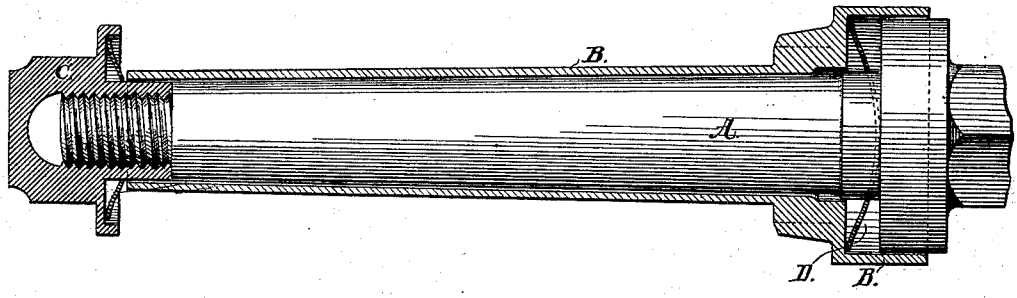


Fig. 2.

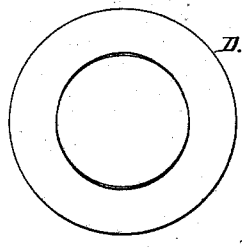
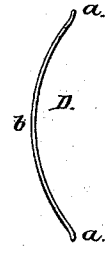


Fig. 3.



Attest,

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UNITED STATES PATENT OFFICE.

DAVID DALZELL, OF SOUTH EGREMONT, MASSACHUSETTS.

IMPROVEMENT IN SPRING-WASHERS FOR VEHICLE-AXLES.

Specification forming part of Letters Patent No. **216,512**, dated June 17, 1879; application filed November 1, 1878.

To all whom it may concern:

Be it known that I, DAVID DALZELL, of South Egremont, in the county of Berkshire and State of Massachusetts, have invented a new and useful Improvement in Carriage-Axles; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a longitudinal section of an axle embodying my invention. Fig. 2 is a front view of the spring-pressure washer, and Fig. 3 a vertical sectional view through its resisting-points.

This invention relates to an improvement upon the compound spring-pressure washer for which Letters Patent of the United States were granted to me February 23, 1875, No. 160,007; and the improvement consists in substituting therefor a spring-pressure washer composed of a single piece, and whereby one of the elements of said compound washer is dispensed with, and such change of form and construction given to the remaining or metallic portion as to secure a saving of original cost, better results, and adaptation to all forms of axles in which the ordinary leather washer is used.

The object of this invention is to secure an elastic bearing to resist the lateral play of carriage-wheels, (produced either intentionally or resulting from wear,) and whereby a noiseless and easy motion is obtained, and the wheel relieved from shock or sudden strain.

In the drawings, A represents the axle-arm, B the box, and C the nut. D represents the improved spring-pressure washer. (Shown detached in Fig. 2.) This washer is composed of thin tempered steel, of an annular shape, and bent in conformity with the line, Fig. 3, illustrating its vertical section through the opposite bearing-points *a a b*.

The amount of curvature given in its construction may be determined and regulated according to the depth of the nut, box, or axle-arm chambers in which it is placed, or such a degree of curvature that will fill extreme sizes, and by its compression the washer will adapt itself to any depth of chamber. This washer may be cut and stamped to form in suitable dies with great facility, which renders its original cost merely nominal.

Heretofore the effect produced by this invention has been accomplished only by means of a special construction of the axle arm and box, to adapt the same to the use of coiled springs, which not only increases the comparative cost, but reduces the box-bearing surfaces, and cannot be applied to axles already in use or of ordinary construction.

I do not claim, *per se*, an annular spring-washer; but its employment between the fixed and moving parts of axles is attended with special advantages, the form of this improved spring-washer being such as to reduce its resisting-surface to the least possible amount, and which materially lessens the usual friction.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

In combination with an axle arm and box, the curved annular metallic spring-pressure washer D, substantially as shown and described.

DAVID DALZELL.

Witnesses:
JOHN VAN DEUSEN,
CHAS. W. FORBES.