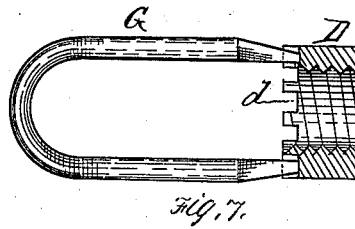
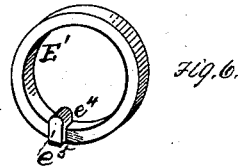
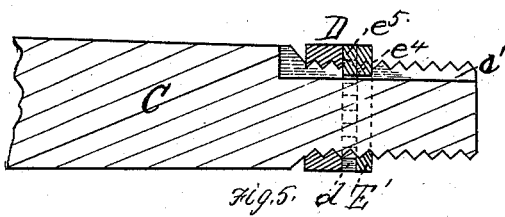
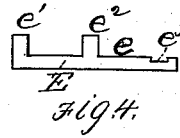
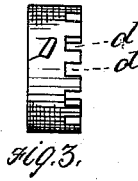
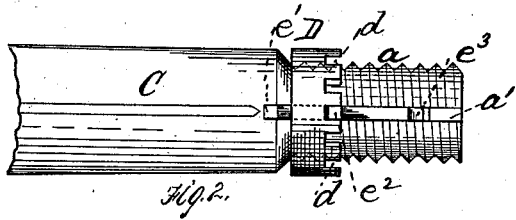
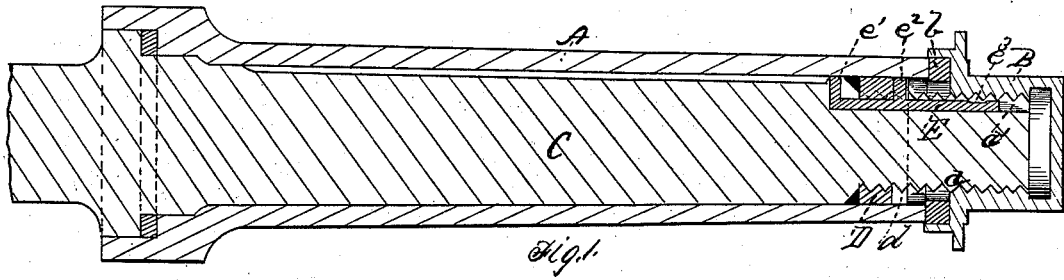


O. B. THOMPSON.
Vehicle-Axle.

No. 217,027.

Patented July 1, 1879.



Witnesses.
J. K. Smith
R. W. Marshall

Inventor.
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UNITED STATES PATENT OFFICE

ORRIN B. THOMPSON, OF JERSEY, OHIO.

IMPROVEMENT IN VEHICLE-AXLES.

Specification forming part of Letters Patent No. **217,027**, dated July 1, 1879; application filed May 22, 1879.

To all whom it may concern:

Be it known that I, ORRIN BARNES THOMPSON, of Jersey, in the county of Licking and State of Ohio, have invented a new and useful Improvement in Adjustable Axles; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a longitudinal central section of an axle and box illustrating the preferred form of my invention. Fig. 2 is an elevation of the axle, notched adjustable ring, and key. Figs. 3 and 4 are detached views of the key and notched adjustable ring. Fig. 5 is a longitudinal central section of an axle with the notched ring and a modification of the key, the latter being in the form of a threadless ring. Fig. 6 is a detached view of the threadless-ring key. Fig. 7 is a view of an U-shaped wrench, which may be employed with the devices shown in Figs. 1 and 2 when it is desirable to make the adjustment without removing the wheel.

Like letters refer to like parts wherever they occur.

My invention relates to the construction of what are termed "adjustable axles" or anti-rattling axles for vehicles; and it consists, first, in combining with the spindle an adjustable notched threaded sleeve or ring and a sliding key, adapted to enter one or more of the edge notches of the adjustable sleeve or ring, and also a notch or groove in the spindle, whereby the movable sleeve may be adjusted and secured in any desired position, either to dispense with washers or to take up the wear of the washers, &c., and prevent rattling and end motion of the box; secondly, in combining with the axle an edge-notched adjustable sleeve or ring and a notched sliding key, adapted to be disengaged from the notched ring without displacing the box, whereby any or all required adjustments of the compensating adjustable sleeve to take up wear may be made without removing the wheel; and, finally, in details of construction, hereinafter more specifically set forth.

In the better class of vehicles as ordinarily constructed the wheels are held on the axle or spindle by threaded caps, the boxes are

usually somewhat shorter than the unthreaded or bearing portion of the spindle, and washers are employed to take up the slack and prevent end motion of the box, wear, and rattling. In course of time the wearing away of the washers will permit the wheels to rattle or chatter, and the washers have to be replaced by new ones; but the difficulty of always obtaining washers of the proper thickness, &c., has led to the construction of various devices for compensating for the wear—as, for instance, various forms of nuts, whereby the advance of the nut on the spindle could be limited, increased, or diminished at will, and adjustable sleeves upon the spindle, whereby either the bearing-surface of the spindle or the advance of the nut could be limited and adjusted.

To this latter class of devices my present invention belongs, and has for its object to simplify the devices and insure against loss of adjustment when the wheel is wholly or partially removed—as, for instance, in greasing the axle—provide against loss of any of the devices, and to permit of the adjustment being altered without removing the wheels.

I will now proceed to describe my invention, so that others skilled in the art to which it appertains may apply the same.

In the drawings, A indicates the ordinary axle-box, and B the usual or any approved cap or nut, cupped to receive a washer, *b*, or inclose the end of the axle-box A. C represents the spindle or axle, of the usual length with relation to the axle-box A, but threaded for a greater distance from its end, as at *a*, so that the threaded portion shall extend into the box when the wheel is on the axle.

In addition to the usual groove for the lubricant a longitudinal key-groove, *a'*, is formed in the threaded portion of the spindle to receive a sliding key, used for locking the adjustable sleeve or ring. D indicates the adjustable sleeve or ring, threaded upon its interior to correspond with the thread on the end of the spindle C, and provided with a series of key-notches, *d*, on one end and at short intervals, to permit of nice and accurate adjustment.

E indicates the preferred form of key, which is composed of a body, *e*, with lugs or projections *e*¹ *e*² and a notch, *e*³. When in use

the body portion e of the key rests and slides in the groove a' of the spindle, one lug, e^1 , being on the inner side of the adjustable threaded sleeve D, and the other lug, e^2 , being outside the ring or sleeve D, so that the sleeve will keep the key E in the groove and prevent its loss. These lugs e^1 e^2 should be slightly less in length than the thickness of ring D, so that the box will not touch or displace the key.

For the purposes of locking or fixing the position of the adjustable ring, it will be apparent a key having lugs which enter the notches in the ring and the groove on the spindle (the equivalents of e e^2) will suffice, and I may therefore use a key similar to what is shown in Figs. 5 and 6—that is to say, a threadless ring, E', with lugs e^4 and e^5 ; but such a key is not as desirable as the one first described, because it cannot be withdrawn to adjust the movable sleeve D without removing the wheel, and in removing the wheel the ring-key is liable to be dragged off and lost.

G indicates the U-shaped wrench, which may be used in adjusting the threaded sleeve or ring D when the wheel is not removed from the axle.

The above-described devices are employed as follows: The adjustable sleeve D is screwed on the threaded end of the spindle until it projects sufficiently far beyond the axle-box to arrest the screw-cap or nut B just before it binds the box A. The key is then pushed along the groove until the outer lug, e^2 , engages with a notch, d , of the ring or sleeve D, thus preventing the sleeve from advancing farther. The axle-box A is then placed on the axle, and the screw-cap or nut B screwed on to hold the wheel in place. If, from wear of the washers or from other cause, the box commences to clatter or rattle, this screw-cap or nut B is removed, the end of wrench G is inserted in notch e^3 of the key, and the key drawn forward, so as to remove lug e^2 from notch d of the sleeve, after which the two ends of the

U-shaped wrench are applied in the notches d of the sleeve or ring D, and the sleeve adjusted along the thread to the desired point, when the screw-cap or nut B can be replaced.

Where the modification shown in Figs. 5 and 6 is employed, the box will have to be withdrawn to remove the ring-key from the notches of sleeve D before the sleeve can be adjusted.

The advantages of my invention are the secure manner in which the adjustable sleeve is held, so that the movements of the box or the removal of the wheel for oiling, &c., cannot effect the adjustment; ease and rapidity with which the devices can be adjusted to take up the slack, compensate for wear of the washers, and correct any noise or rattling, and the ability to adjust the devices without removing the wheel.

Having thus set forth the nature and advantages of my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination, with the grooved threaded spindle, of an adjustable threaded edge-notched ring or sleeve and a sliding key adapted to engage with the groove of the spindle and a notch in the threaded ring, substantially as and for the purpose specified.

2. The combination, with the threaded grooved spindle, of a threaded edge-notched ring, and a sliding key having a locking-lug and a notch, substantially as and for the purpose specified.

3. The combination, with the threaded grooved spindle, of a threaded edge-notched ring and a sliding key having two lugs, between which the ring rests, substantially as and for the purpose specified.

In testimony whereof I, the said ORRIN B. THOMPSON, have hereunto set my hand.

ORRIN BARNES THOMPSON.

Witnesses:

OTIS D. THOMPSON,
CHAS. W. FISH.