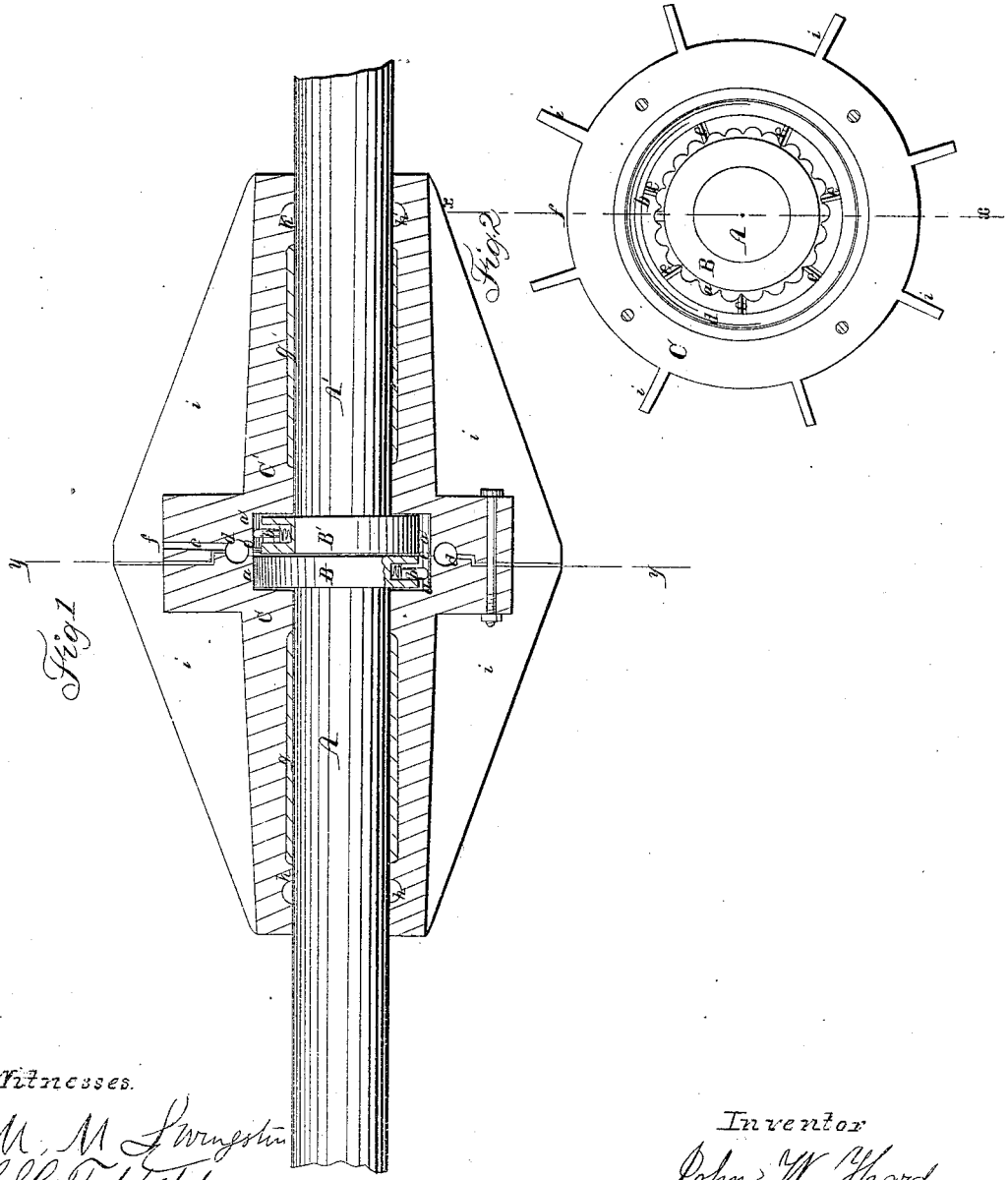
J. W. HARD.

Car Axle.

No. 47,015. Patented Mar. 28, 1865.



Witnesses.

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JOHN W. HARD, OF DECORAH, IOWA.

IMPROVEMENT IN CAR-AXLES.

Specification forming part of Letters Patent No. **47,015**, dated March 28, 1865.

To all whom it may concern:

Be it known that I, J. W. HARD, of De corah, in the county of Winneshiek and State of Iowa, have invented a new and useful Improvement in Car-Axles; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 represents a longitudinal central section of this invention, the line *x x*, Fig. 2, indicating the plane of section. Fig. 2 is a transverse vertical section of the same, the line *y y*, Fig. 1, indicating the plane of section.

Similar letters of reference indicate corresponding parts.

This invention relates to certain improvements in that class of car-axles which are made in two parts, so that each wheel can revolve independent of the other.

The invention consists in the arrangement of a muley-ratchet in the interior of the coupling, to operate, in combination with two spring-dogs—one in each of the inner ends of the two half-axles—in such a manner that when the wheels are moving on a rectilinear portion of the track both half-axles revolve simultaneously, like an ordinary solid car-axle, but if the wheels move on a curve the inner wheel lags behind the outer wheel sufficient to prevent undue friction on and injury to the track.

The invention consists, also, in the arrangement of an annular oil-reservoir in the coupling, communicating by radiating channels with the inner ends of the half-axles and by a suitable hole with the exterior of the coupling, in such a manner that a suitable supply of oil can always be introduced and the working surfaces of the axle and coupling can be prevented from heating.

The invention consists, also, in the arrangement of the waste-oil reservoir in the outer ends of the coupling, to retain all that portion of the oil which by the motion of the half-axles may be forced out beyond the stuffing-boxes in the coupling, and the soiling of the axles and waste of oil is prevented.

The invention consists, finally, in strengthening the coupling by a series of longitudinal ribs, which also serve as a fan to ventilate or assist in ventilating the car.

A A′ represent two half-axles, each of which is firmly keyed to one of the wheels and which are enlarged at their inner ends to form rings B B′, as clearly shown in Fig. 1 of the drawings. These rings are firmly shrunk to or made solid with the half-axles, and they fit into recesses *a a′* in the inner ends of the half-couplings C C′. These half-couplings are firmly united to each other by screw-bolts or in any other suitable manner, and they fit loosely on the half-axles, so that each of said axles is allowed to turn independent of the other.

In order to compel the coupling to rotate with the half-axles while the wheels are running on a straight track the peripheries of the recesses *a a′* are scalloped, and spring-dogs *b b′*, fitted in the rings B B′, catch into the scallops, and thereby the axles and coupling are locked together and made to rotate like an ordinary solid axle as long as the wheels run on a straight track; but when the wheels arrive on a curve, where the outside wheel has to travel a longer distance than the inside wheel, the spring-dogs slide over the scallops and allow the inside wheel to lag behind without causing an undue or injurious strain on the axle. In the drawings only one spring-dog is represented in each ring, but in practice four (more or less) such dogs will be applied to each ring, and by these dogs the axles are securely held in the center of the coupling and prevented from rattling. The force of the springs acting on these dogs is such that the coupling is compelled to revolve with the axles, as above stated, and all unnecessary friction is avoided as long as the wheels run on a straight track, and if they come on a curved track the spring-dogs give and allow the inside wheel to lag behind and all injurious strain of the axle is avoided. The inner ends of the half-axles A A′ are supplied with oil or other lubricating material through a hole, *c*, bored edgewise through the flange of one of the half-couplings and leading to an annular reservoir, *d*, which communicates by radiating grooves *e* with the recesses *a a′*. The hole *c* is closed by a screw-plug, *f*, which can be readily removed whenever it may be desirable. The half-axles A A′ extend through stuffing-boxes *g g′* in the interior of the half-

couplings C C′, and the oil which may find its way through these stuffing-boxes collects in circular grooves *h h′*, turned in the half-couplings near their ends, as clearly shown in Fig. 1 of the drawings. By these grooves all the waste oil is retained and the soiling of the half-axles is prevented. The coupling is strengthened by longitudinal wings or ribs *i*, which rise above the flanges at the inner ends of the half-couplings, and which may also be used as fans for the purpose of ventilating the cars.

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

1. The spring-dogs *b b′* and scalloped recesses *a a′*, in combination with the half-axles A A′ and half-couplings C C′, constructed and operating substantially as and for the purpose set forth.

2. The annular oil-reservoir *d* and radiating channels *e*, in combination with the half-axles and couplings, constructed and operating substantially as and for the purpose described.

3. The circular grooves *h h′*, near the outer ends of the half-couplings, applied and operating substantially as and for the purpose specified.

4. The wings *i*, projecting from the peripheries of the half-couplings, substantially as and for the purpose set forth.

JOHN W. HARD.

Witnesses:

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