

H. WATKEYS.
Car-Axle.

No. 213,597.

Patented Mar. 25, 1879.

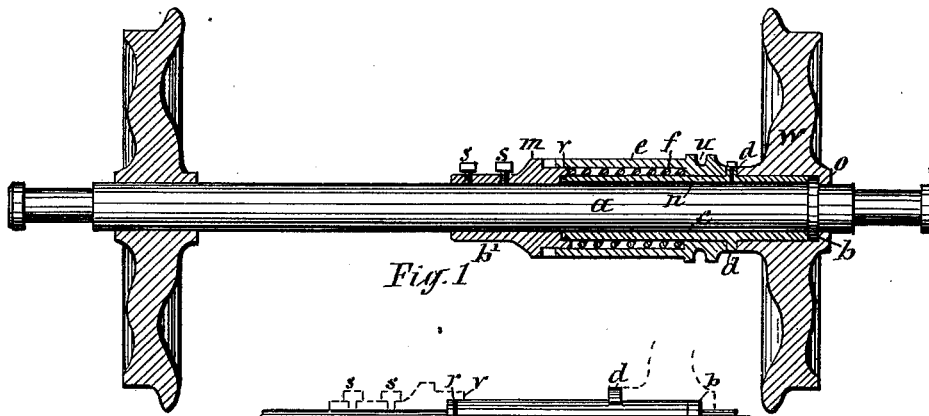


Fig. 1

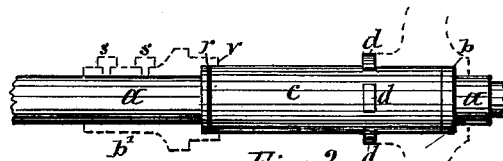


Fig. 2



Fig. 5

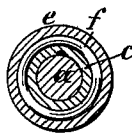


Fig. 6

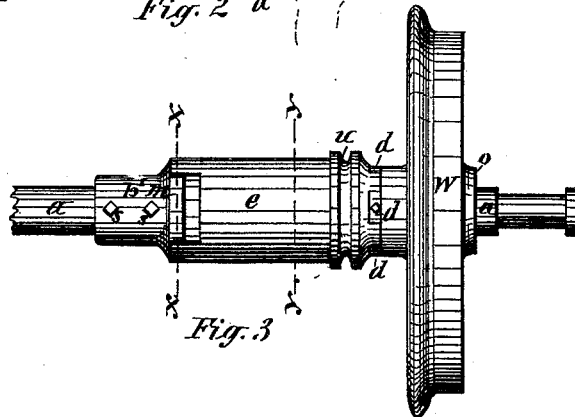


Fig. 3

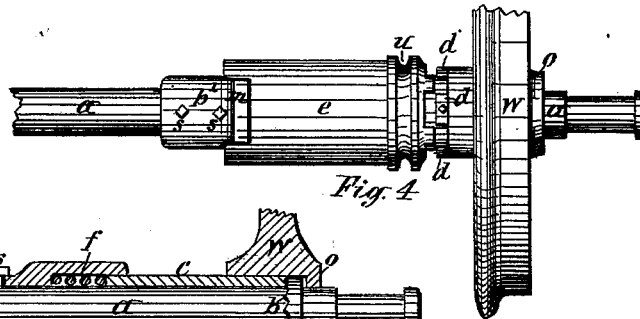


Fig. 4

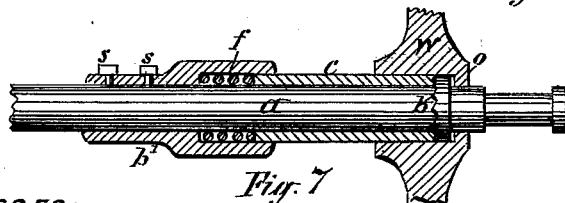


Fig. 7

WITNESSES:

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H. Hill

INVENTOR:

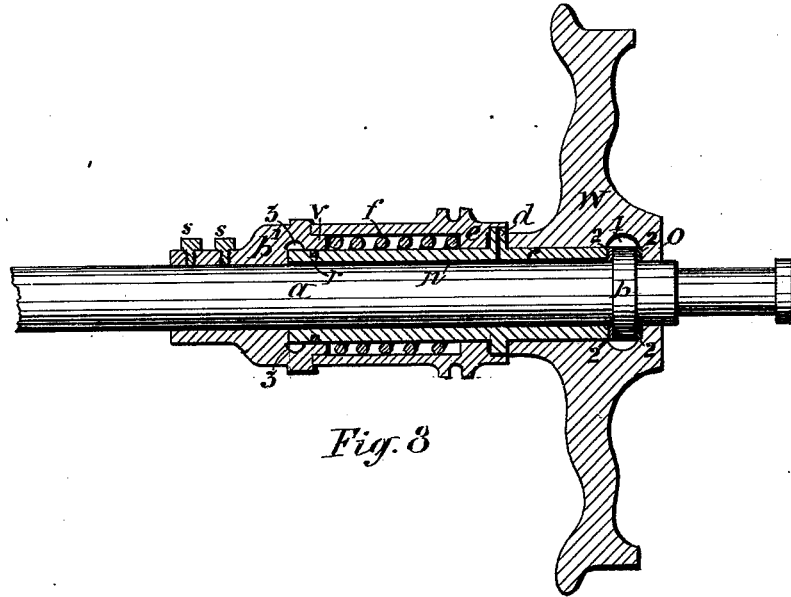
Henry Watkeys
per E. Laess Atty.

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UNITED STATES PATENT OFFICE.

HENRY WATKEYS, OF SYRACUSE, NEW YORK.

IMPROVEMENT IN CAR-AXLES.

Specification forming part of Letters Patent No. **213,597**, dated March 25, 1879; application filed June 27, 1878.

To all whom it may concern:

Be it known that I, HENRY WATKEYS, of the city of Syracuse, State of New York, have invented new and useful Improvements in Car-Axles, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to car-axles designed to have their wheels capable of revolving independent of each other; and it consists, first, in the combination, with an axle having a sleeve confined laterally between two collars and a wheel fixed to the end of said sleeve, of two clutch-collars fixed, respectively, to the sleeve at the rear of the wheel and to the axle at the end of the sleeve, and a clutch adapted to engage at its ends, respectively, with the said clutch-collars, whereby the loose wheel can be deprived of its independent rotary movement when traversing straight tracks, and thus cause the said wheel to surmount more safely obstructions on the track by the momentum of the two wheels combined.

It also consists in a novel construction and arrangement of the clutch and a spring inclosed by and automatically maintaining the said clutch interlocked or engaged with the clutch-collars.

It also consists in the combination and arrangement, with a sleeve confined laterally between collars fixed to the axle, of a lubricating-channel extending the length of the interior of the sleeve, and having an inlet at the rear of the wheel, by which arrangement the lubricant is uniformly distributed over the entire length and ends of the sleeve.

It also consists in the combination and arrangement, with a sleeve having a lubricating-channel extending the length thereof, of a packing-ring applied to the external periphery of the sleeve near the rear end thereof and an enlargement of the inner circumference of the overlapping flange of the rear collar, whereby a receptacle is formed for the lubricant issuing at the rear end of the sleeve, and thus the waste of same is prevented, and the bearing against the end of the sleeve thoroughly lubricated; and it furthermore consists in the combination and arrangement, with a sleeve confined laterally between collars fixed to the

axle, and having a lubricating-channel extending to the outer end thereof, of the wheel fixed to the end of the sleeve, and having in the interior of its hub an oil-receptacle formed by an enlargement of the inner periphery of the hub at the end of the sleeve and a contraction of the hub at the outside of the outer collar, all constructed, combined, and arranged substantially in the manner hereinafter more fully described.

The invention is fully illustrated in the accompanying drawings, wherein Figure 1 is a longitudinal section of a car-axle provided with my improvements; Fig. 2, an exterior view of the sleeve and part of the axle; Fig. 3, an exterior view of my invention, showing the clutch in position for confining the wheel circumferentially on the axles, and thus rendering it stationary thereon; Fig. 4, the same with the clutch thrown out of connection to allow the wheel to revolve on the axle; Fig. 5, a transverse section on line *xx* of Fig. 3; Fig. 6, a transverse section on line *yy* of Fig. 3; and Figs. 7 and 8 are detail views illustrating modifications of my invention.

Similar letters of reference indicate corresponding parts.

a represents the axle, having near its end a collar, *b*, permanently attached thereto, and about midway between the wheels a collar, *b'*, secured in its position on the axle by set-screws *s s*, or other suitable means.

Between the said collars is laterally confined the sleeve *c*, fitted loose to the axle, and having fixed to its outer end the wheel *W*. At the rear of the wheel the sleeve is provided on its exterior with a rigid collar or shoulders, *d d*, of a form adapted to retain objects of corresponding configuration brought in contact with it.

e represents one form of a clutch, particularly adapted for the before-described devices. It consists of a collar fitted loosely to the exterior of the sleeve *c*, at the rear of the shoulders *d d*, and constructed at the end adjacent to said shoulders of a form to enable it to interlock or engage with same. From the said loose collar, and integral therewith, is extended rearward a cylindrical shell, the inner circumference of which is sufficiently larger

than the exterior of the sleeve to contain between them, and thus completely inclose, a spiral spring, *f*, which exerts its resiliency against shoulders respectively on the collar *b'* and interior of cylindrical shell of the clutch. The rear end of said shell is extended over the collar *b'*, and provided with lugs or projections adapted to slide in without becoming disengaged from apertures or excisions in a flange, *m*; on the exterior of collar *b'*.

The clutch *e* is held engaged with the shoulders *d* on sleeve *c* by the expansive force of the spring *f*, and thus the wheel is held stationary on the axle. The clutch is thrown out of its connection with the collar *d*, and the wheel thus released and allowed to revolve on the axle by means of an ordinary shifting-lever applied in the seat *v*, or otherwise suitably connected with the clutch, and arranged to be controlled by the driver or person in charge of the car.

The arrangement of a clutch with loose car-wheels is more particularly designed for street-cars. The object of the device is to enable the wheel to pass more safely over obstructions on the track. It having been ascertained that, owing to the predominance of the friction on the rail over that on the axle, wheels mounted loose on the axle will, when coming in contact with obstructions on the track, allow the wheel on the opposite end of the axle to advance and leave the track, whereas wheels fixed stationary on the axle are carried over ordinary obstructions on the track by the momentum of the two wheels combined, and since most roads have more straight than curved track, it is deemed best to arrange the clutch so as to normally remain in connection with the loose wheel and allow it to be thrown out of connection therewith when traversing curves.

It is obvious that the construction of the clutch admits of many variations and modifications.

A very simple, effective, and automatic clutch is illustrated in Fig. 7 of the drawings, in which the sleeve which carries the loose wheel forms the clutch with the outer rigid collar, *b*, on the axle. In this instance the wheel has sufficient lateral play between its outer shoulder, *o*, and the collar *b* on the axle to allow the sleeve to slide rearward and become disengaged from the collar *b*.

The spiral spring *f* is interposed between the inner end of the sleeve and a shoulder on the rear collar, *b'*, and keeps the clutch in connection in the same manner as first described. The shifting-lever is dispensed with, and the pressure against the flange of the wheel relied on as the power for moving the clutch, thus automatically releasing the wheel when traversing around curves.

n is a lubricating-channel in the interior surface of the sleeve, extending the length thereof, and having an inlet through the collar *d* at the rear of the wheel, thus admitting the lubricant at a point better protected and nearer

the center of the sleeve than former lubricating devices, and uniformly distributing the lubricant over the entire length of the sleeve.

To prevent waste of the lubricant, and properly apply the same to the bearing against the end of the sleeve, a receptacle, 3, for same is formed at the rear end of the sleeve by an enlargement of the internal periphery of the flange *v*, which projects from the collar *b'* and overlaps the end of the sleeve, and a packing-ring, *r*, is applied between the external periphery of the sleeve and the overlapping flange *v*. To attain the same object at the opposite end of the sleeve, a lubricant-receptacle, 1, is formed by an enlargement of the internal periphery of the hub at the end of the sleeve, and an inward flange or contraction, *o*, of the hub at the outside of the outer collar, *b*.

2 2 are anti-friction metal rings, which may be inserted at the sides of the collar *b*, to compensate for wear at that point.

Having described my invention, what I claim is—

1. The combination of a car-axle provided with rigid collars, a sleeve fitted loose to the axle between said collars, and having fixed to its end one of the wheels, and a clutch arranged to confine the said sleeve circumferentially on the axle, substantially as described.

2. The combination of the axle *a*, provided with collars *b b'*, the sleeve *c*, confined laterally between said collars, and having fixed to its end the wheel *W*, and provided at the rear thereof with clutch-collar *d*, the collar *b'*, having flange *m*, with apertures or excisions, and the clutch *e*, adapted to engage at its ends respectively with the collars *d* and *b'*, substantially as described and shown.

3. The combination and arrangement of the sleeve *c*, having fixed to its outer end the wheel *W*, and provided at the rear thereof with clutch-collars *d*, the clutch *e*, having a rearwardly-extended cylindrical shell of greater inner circumference than the exterior of the sleeve, and fitted to slide longitudinally in excisions in flange *m* on collar *b'*, and the spring *f*, inclosed between the shell of the clutch and sleeve, all constructed and arranged in the manner described and shown.

4. In combination with the axle *a*, provided with collars *b b'*, the sleeve *c*, having in its interior the lubricating-channel *n*, extending the length thereof, and a lateral inlet at the rear of the wheel, substantially as described and shown, for the purpose set forth.

5. The combination and arrangement, with the sleeve *c*, having lubricating-channel *n* extending the length thereof, of the oil-receptacle 3, formed by an enlargement of the internal periphery of flange *v*, and the packing-ring *r*, applied between the external periphery of the sleeve and overlapping flange *v*, substantially in the manner specified and shown.

6. In combination with the sleeve *c*, con-

finned laterally between collars *b b'* on the axle, and provided with lubricating-channel *n*, the wheel *W*, fixed to said sleeve, and having at the end thereof an oil-receptacle formed by an enlargement of the internal periphery of the hub, and an inward flange or contraction, *o*, of the hub at the outside of collar *b*, substantially as described and shown.

In testimony whereof I have hereunto set my hand this 21st day of June, 1878.

HENRY WATKEYS.

Witnesses:

G. E. WOOD,
H. HILL.