(No Model.)

N. CASEY.

APPARATUS FOR GRINDING CAR WHEELS IN PLACE.

No. 566,891. Patented Sept. 1, 1896.

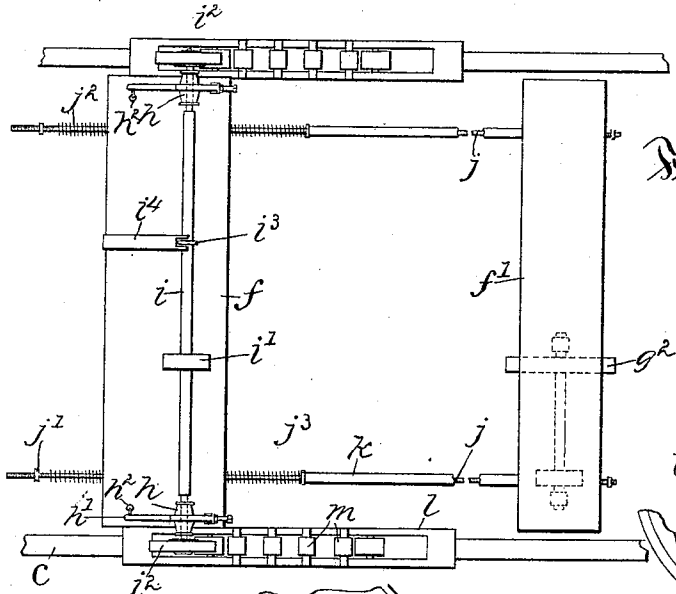

Fig. 1.

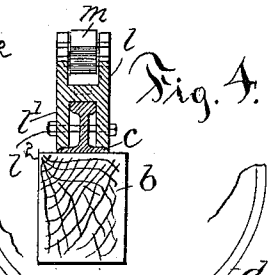

Fig. 4.

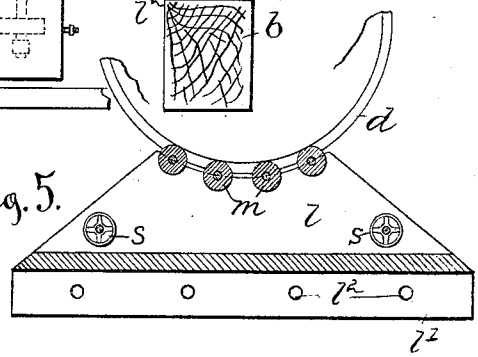

Fig. 5.

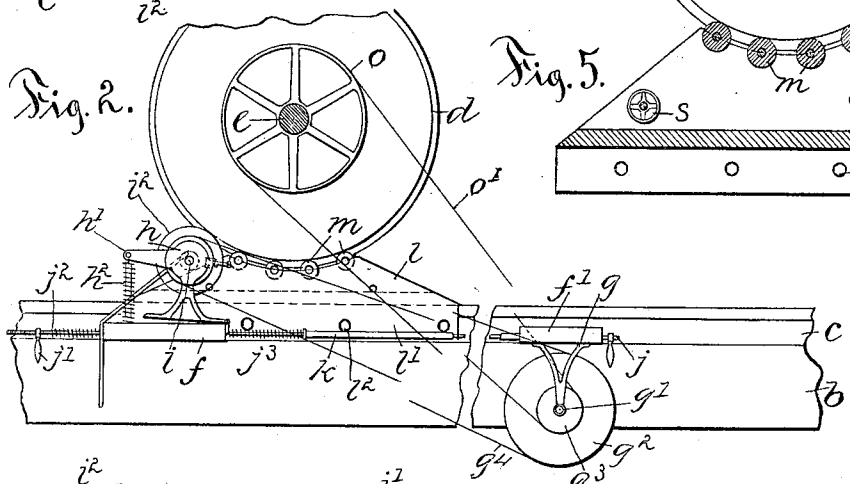

Fig. 2.

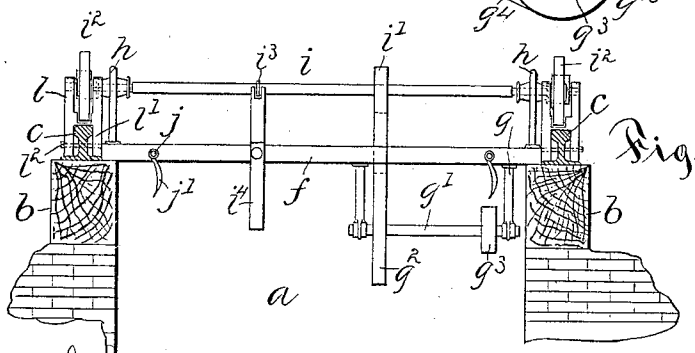

Fig. 3.

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APPARATUS FOR GRINDING CAR-WHEELS IN PLACE.

SPECIFICATION forming part of Letters Patent No. 566,891, dated September 1, 1896.

Application filed December 17, 1895. Serial No. 572,446. (No model.)

To all whom it may concern:

Be it known that I, NIRAM CASEY, a citizen of the United States, and a resident of Manchester, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Apparatus for Grinding Car-Wheels in Place, of which the following is a full, clear, and exact description, whereby any one skilled in the art can make and use the same.

The object of my invention is to provide an apparatus by means of which a car-wheel which is flat either through use or imperfect construction may be ground true to shape without removing the wheel from the car.

Whenever prior to my invention a car-wheel has become flat it has resulted in the loss of the pair of wheels, which have to be taken off and returned to a repair-shop or car-wheel factory for grinding and truing up as to the tread of the wheel. This has been done only at great expense; but by means of my improvement the car-wheel can be trued and ground without requiring the car to be removed from the car-barn or the wheel to be taken off from the truck or its journal-bearings in the truck.

To the end above stated my invention consists in the details of the several parts making up the grinding apparatus as a whole and in the combination of such parts with driving means, as more particularly hereinafter described, and pointed out in the claims.

Referring to the drawings, Figure 1 is a top or plan view of my improved grinding apparatus. Fig. 2 is a side view of the same, showing a car-wheel in place thereon. Fig. 3 is a detail end view in section through a pit, showing my improved apparatus in place. Fig. 4 is a detail view in central cross-section through the cradle for the car-wheel. Fig. 5 is a detail view in lengthwise central section through the same.

In the accompanying drawings the letter *a* denotes a pit over which my improved device is preferably arranged, the usual stringers *b* extending lengthwise along this pit, on which are located the rails *c*, on which the car travels.

The letter *d* denotes a car-wheel, and the letter *e* the axle thereof, that remains attached to the car-truck in the usual manner when the operation of grinding a pair of wheels is being performed.

Planks *f f'* are placed across the pit from side to side, resting upon the stringers *b* at each end. The plank *f'* bears hangers *g*, in which is mounted a shaft *g'*, bearing pulleys g^2 g^3. On the plank *f*, near each end, are placed shaft-supports *h*, in which is mounted a shaft *i*, bearing a pulley *i'* and grinding-wheels i^2. This shaft *i* is movable longitudinally in its supports for the purpose of covering the entire width of the surface on the edge of the wheel, the means herein shown consisting of a collar i^3, located in the bifurcated end of a lever i^4, pivoted to the blank *f*. Each of the shaft-supports *h* is hinged to the plank *f*, as shown in the side view in Fig. 2 of the drawings, a spring h^2 underlying an arm *h'* from the shaft-support and tending to force it normally toward the car-wheel *d* to maintain the polishing-wheels *i* in contact therewith.

Rods *j* are secured by one end to the plank *f'*, and are loosely connected at the opposite end with the plank *f* and are screw-threaded beyond the plank *f*. Screw-arms *j'* are borne on the threaded ends of the rods *j*, and springs j^2 are located between these arms and the edge of the plank. Each of the rods *j* extends through the casing *k*, located between the planks, and springs j^3 are placed on the rods between the casings *k* and the inside edge of the plank *f*. These springs, in connection with the springs h^2, connected with the shaft-supports *h*, serve to hold the polishing-wheels i^2 against the edge of the car-wheel with a yielding contact, and by means of the screw-arms *j'* any desired tension on the springs j^2 and j^3 may be had, and the plank *f* and polishing-wheels located thereon moved to any desired position.

The means for supporting the polishing-wheels in yielding contact with the car-wheel to be ground is essential in a device of this class for the reason that a greater part of the axles of trolley-cars or the like are more or less sprung, so that when the wheels of the car are revolved in the operation of grinding that is necessary with my improved device the said wheels are given an uneven rotation, and

the grinding-wheels must be so constructed as to accommodate themselves to the unevenness of this rotation.

I am aware that devices have been employed for truing of the driving-wheels of locomotives and that it is not broadly new to employ the power used to drive a car or the like for grinding purposes, and I do not broadly claim such idea. The shafts bearing the driving-wheels of locomotives, however, must be perfectly true, so that the rotation of the driving-wheel will be even, and therefore no yielding support is needed for the polishing-wheel, as is the case in the grinding of the wheels of trolley-cars and the like.

In the operation of my within device it is necessary that the wheels of the car shall be rotated by the motor employed to drive the car, and for this purpose means for permitting said rotation of the wheels must be provided. In the construction of such cars the brass boxes interposed between the car and the axle are located on the top of the latter, and the oil-well underlying the axle is so constructed that no means are provided for the location of a journal in which the axle could rotate underneath the latter. Practically the entire space between the two wheels is occupied by the motor, and for these reasons no means are provided for jacking up the car and allowing the wheels to freely rotate. Should a car be so jacked, up the construction of the oil-wells and parts underneath on which the axle would rest is such that the latter would soon become so worn as to be practically useless and long before the operation of turning the wheels true would be completed. To obviate these difficulties, I have provided a cradle *l*, adapted to rest on the rail, flanges *l'* extending on opposite sides of the rail, in which are located bolts l^2 for the purpose of clamping the cradle in place. Rollers *m* are journaled in this cradle, said rollers preferably consisting of three or more in number, in the present instance four being shown. These rollers are arranged with their outer surfaces in a circular line to conform to the tread of a car-wheel, and a plural number of rollers, as described, are provided, for the reason that when a flat place on the car-wheel in the rotation of the latter approaches a roller the weight of the car will be borne by the other rollers on a true surface of the car-wheel, this preventing the flat place from striking any of the rollers and obviating a "pounding" of the wheel in its rotation.

The cradles are inclined on opposite sides, so that a car may be run up the incline until the wheels to be ground are properly located on the rollers on the cradle. These rollers are preferably removably located in recesses in the upper edge of each of the flanges on opposite sides of the cradle, the flange of the car-wheel being located at one side of the rollers, overhanging the edges of the rollers, which thus constitute shoulders or stops to hold the car-wheel against lateral movement. A pulley *o* is secured to the shaft *e*, supporting the car-wheels, and a belt *o'* passes from this pulley to the pulley g^3 on the shaft *g'*. A belt g^4 is extended from the pulley g^2 on the shaft *g'* to the pulley *i'* on the grinding-shaft *i*, and the power used to rotate the car-wheels is thus transmitted and utilized for the purpose of rotating the grinding-wheels.

It will be observed that the shaft *g'*, which is belted to the shaft *e*, carrying the wheels to be ground, and also to the grinding apparatus, is situated below the cradles upon which the wheels rest, with the result that the tension upon the belt *o'* tends to hold the wheels down upon the cradles and lessens the liability of the wheels running off or being pulled off the cradles, as might occur were the pull of the belt upon the shaft *e* entirely to one side.

If desired, the power from the driving-axle may be transmitted to the grinding-wheel by means of a belt passing directly around the flange of the wheel being ground, and in this instance idlers *s* are provided in the cradle for the purpose of conducting the belt underneath the rollers.

I claim as my invention—

1. In combination, with means for supporting a pair of car-wheels, the hinged shaft-supports *h*, *h*, a shaft mounted therein and carrying near each end a grinding-wheel which is arranged in operative relation to the car-wheels, the said shaft being movable longitudinally to a limited extent in its supports, springs arranged to tilt the said supports and hold the grinding-wheels against the car-wheels with a yielding force, and means whereby the shaft of the grinding-wheels may be moved longitudinally in order that the grinding-wheels may be moved across the faces of the wheels being ground, substantially as set forth.

2. In combination, means for supporting a pair of car-wheels, means for driving them, a base, a grinding apparatus supported on the base, means for moving the base with relation to the car-wheels, and springs arranged so as to oppose the thrust of the base, substantially as set forth.

3. In combination, means for supporting a pair of car-wheels, means for driving them, a base, grinding-wheels, tilting supports in which the grinding-wheels are mounted hinged to the base, a spring or springs which operate upon the supports to force the grinding-wheels against the car-wheels, means for moving the base with relation to the car-wheels and springs which oppose the thrust of the base, substantially as set forth.

4. In combination, a cradle for directly supporting a car-wheel to be ground, provided with a series of more than two rolling-supports for the tread of the wheel, arranged close together in an arc corresponding to that of the wheel-tread, means for driving the

wheel while supported in the cradle, a grinding apparatus in operative engagement with the wheel, means for holding the grinding apparatus against the car-wheel with a yielding force, and means for operating the grinding apparatus, substantially as set forth.

5. In an apparatus for grinding car-wheels while in place upon a car which they support, the following instrumentalities in combination, to wit: a pair of cradles each adapted to receive and support a car-wheel, means for holding the said cradles in fixed relations to each other, means for driving the wheels while supported by the cradles, a grinding apparatus in operative engagement with the wheels, and means for driving the grinding apparatus, substantially as set forth.

6. A cradle for supporting a car-wheel while being ground, provided with a series of more than two rollers arranged close together and so as to be directly below the axis of the wheel, and with their surfaces upon which the wheel rests in a curved surface corresponding with the tread of the wheel, combined with a grinding device for operating upon the wheel-tread, substantially as set forth.

7. In an apparatus for grinding car-wheels while in place upon a car which they support, the combination of a pair of cradles each provided with a series of rollers upon which one of the wheels rests, and so arranged as that the flanges of the wheels overhang the ends of the rollers, whereby the wheels are held against lateral movement, and means for holding the cradles fixed with relation to each other, substantially as set forth.

8. A cradle for supporting a car-wheel while being ground, having an inclined end and provided with a series of rollers arranged adjacent to the said inclined end, and in a curved line coinciding with the tread of the wheel, and so as to be directly below the center of the wheel when supported thereon, substantially as set forth.

9. In combination, a pair of cradles, arranged to directly support a pair of connected car-wheels, means for holding the said cradles in a fixed relation to each other, means for driving the wheels, a grinding apparatus, means for holding such apparatus with a yielding force against the wheels, and means for driving the grinding apparatus, substantially as set forth.

10. In an apparatus for grinding wheels while secured upon a shaft, the following instrumentalities in combination, to wit: cradles upon which the wheels rest, provided with antifriction-supports for the wheels, a grinding apparatus, a driving apparatus for the wheels, and a shaft carrying belt-pulleys arranged below the said cradles and connected with the shaft carrying the wheels to be ground, and with the grinding apparatus, by belting, substantially as set forth.

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