No. 646,093. Patented Mar. 27, 1900.

W. P. LESHURE.

MACHINE FOR GRINDING CAR OR ENGINE WHEELS.

(No Model.) (Application filed May 21, 1898. Renewed Sept. 1, 1899.) 2 Sheets—Sheet 1.

Fig. 1.

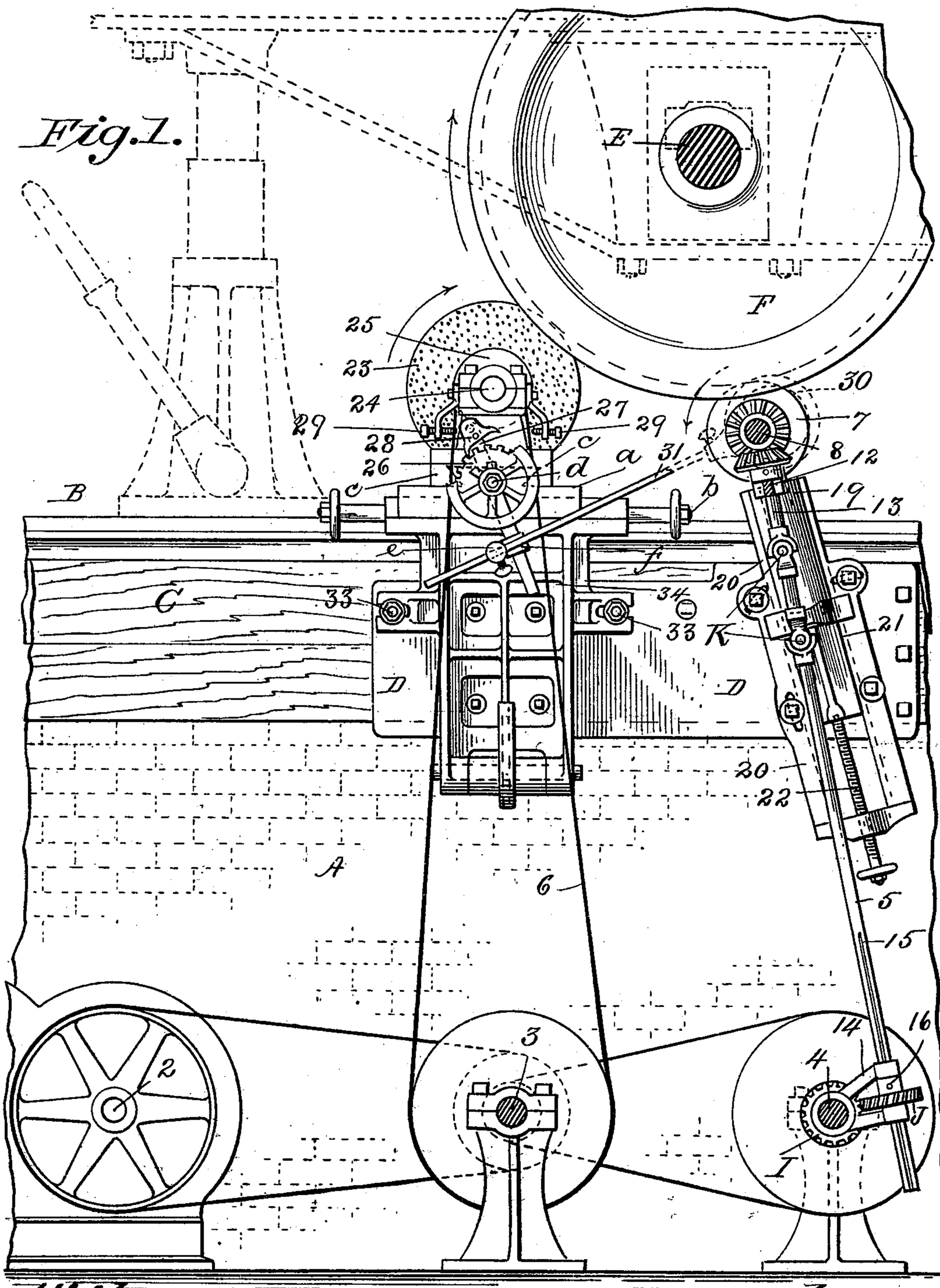

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Fig. 2.

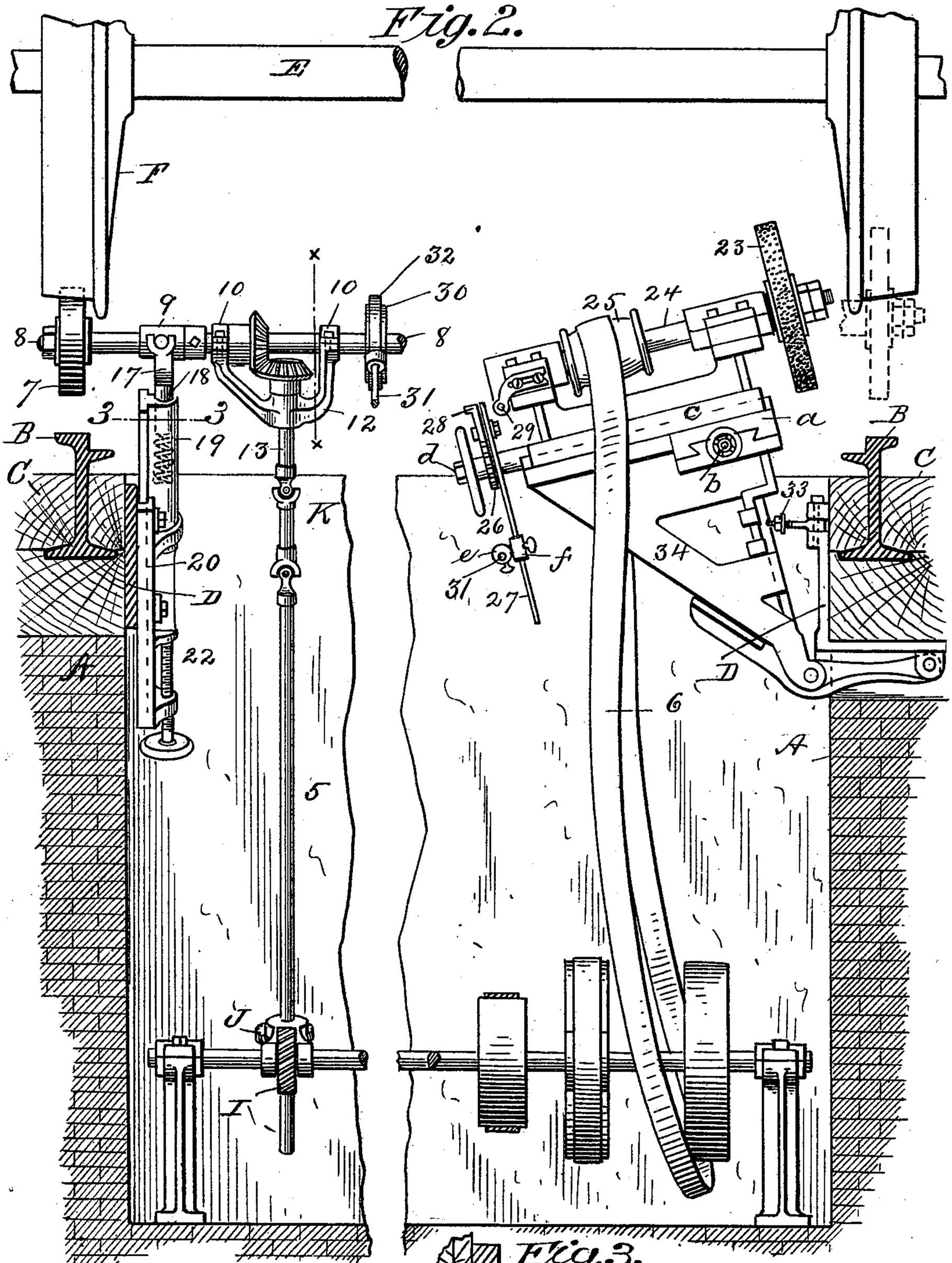
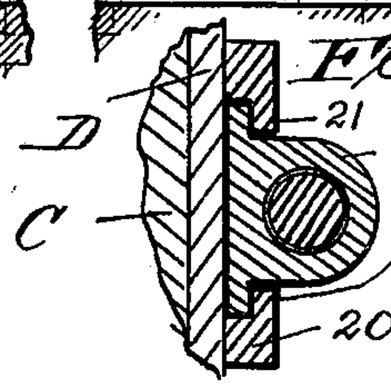


Fig. 3.



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MACHINE FOR GRINDING CAR OR ENGINE WHEELS.

SPECIFICATION forming part of Letters Patent No. 646,093, dated March 27, 1900.

Application filed May 21, 1898. Renewed September 1, 1899. Serial No. 729,261. (No model.)

To all whom it may concern:

Be it known that I, WILLARD P. LESHURE, a citizen of the United States of America, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Machines for Grinding Car and Engine Wheels, of which the following is a specification.

This invention relates to car-wheel-grinding machines, and particularly to that class thereof which is adapted to be operated upon the wheels of cars or locomotives for the purpose of grinding and truing the tread portions thereof while in their normal positions thereon; and the invention consists in the peculiar construction and arrangement of said machines, all as hereinafter described, and more particularly pointed out in the claims.

In the drawings forming part of this specification, Figure 1 is a side elevation of wheel-grinding devices constructed according to my invention, the same being there represented as placed in a pit under and in operative relation to a locomotive-wheel there shown, all of which are hereinafter fully described. A portion of the truck-frame of a locomotive and a lifting-jack are indicated in dotted lines in this figure. Fig. 2 is a cross-sectional view of said pit, showing therein in side elevation my said improved wheel-grinding devices and showing parts of car-wheels and one axle in position over said grinding devices to be operated upon thereby, the grinding and the car-wheel-rotating devices in this figure being shown separately on opposite sides of said pit for the purposes of clear illustration of the construction thereof, as below described; but in practice a group comprising wheel-turning and tread-grinding devices as illustrated in Fig. 1 is arranged upon the opposite walls of said pit, to the end that the grinding and wheel-rotating mechanisms of each group may operate coincidingly and the two wheels on one axle may be separately operated upon. Fig. 3 is a sectional view on line 3 3, Fig. 2, and is hereinafter described.

Referring to the drawings, A indicates the side walls of the pit of the locomotive-engine house.

B is the track on the borders of the pit.

C are the rail-timbers on the walls of the pit. D indicates iron plates secured against the sides of said timbers.

E indicates a car-axle, and F portions of a car or engine wheel.

In preparing for grinding a pair of wheels a lifting-jack, as indicated in Fig. 1, is used to lift the truck-frame and car-axle and wheels thereon away from the tracks B sufficiently to permit the wheel turning and grinding devices to be brought substantially to the operative positions thereunder shown in said figure. Subsequently, however, during the wheel-grinding operation the axle and wheels thereon are supported upon the below-described wheel-turning devices.

2, Fig. 1, indicates a shaft driven by any suitable motor having a belt or other connection with a shaft 3, and the latter, through a smaller pulley thereon (shown in dotted lines) and a belt connection, as shown, drives a third shaft 4 at a slower speed, the said shafts 3 and 4, respectively, actuating the grinding and the car-wheel-rotating devices, the one 4 through the vertically-extending shaft 5 connected with said last-named shaft by slow-motion angular gearing I J, as shown. The grinding devices are connected with said shaft 3 by a belt 6. The said car-wheel-rotating devices consist of a cylindrical element or pulley 7, mounted on a shaft 8 for movement against and frictional contact with said wheel, and said shaft rotates in a rocking box 9 and in boxes 10 10 on the extremities of a yoke 12, carried on the upper section 13 of said shaft 5. The line *x x*, Fig. 2, indicates the section of said yoke in Fig. 1. Said shaft 5 has its lower end supported in bearings in a yoke 14 on said driving-shaft 4, between the arms of which yoke said gear J rotates by engagement with the driving-gear I. The lower end of said shaft 5, which passes through the hub of said gear J, has a longitudinal groove 15 therein, with which the inner extremity of a pin 16 in said hub engages, whereby a sliding connection between said shaft 5 and gear J is provided, to the end that said shaft and connected parts may follow the operative movements of said shaft 8, as below described, and the toggle connections K, Figs. 1 and 2, interposed between said shaft 5 and its separate upper section 13, contribute to said

movements. The principal and essential support of said shaft 8 consists of the parts which carry said rocking box 9, through which said shaft extends, supplemented by said devices carried on said shaft 5, and they are constructed as follows to provide adequate means for lifting a wheel and the axle thereof through the forcible impact of the face of said pulley 7 against the periphery of said wheel and holding the axle constantly against its upper bearing-box in the engine or car truck while the grinding of the wheel proceeds. Thus it follows that the treads of the wheels shall be ground to a true circle, of which the axle on which they are is the center, and, furthermore, that the frictional contact of said pulley 7 with the car-wheel F shall be such as will not fail to impart a continuous rotary movement to the car-wheel during the grinding and truing of the tread thereof. The supporting devices for said box 9 consist of a yoke 17, engaging a trunnion on opposite sides thereof, having an arm 18 thereon freely entering a socket in the upper end of a sliding carrier 19 (see Figs. 2 and 3) and having a yielding support therein consisting of a spring, as indicated in Fig. 2. Said spring, forming the support of said yoke 17, is of sufficient resistance to sustain the weight of the car-wheel F and the end of the axle on which the latter is without deflection when the axle, as aforesaid, is forced against its bearing-box, but said spring may yield slightly when the friction-pulley 7 shall encounter small protuberances on the tread of the wheel during the grinding thereof. Any change of the axial direction of the shaft 8 during said movements of the pulley 7 is provided for by the freedom of said yoke 12 and boxes 10 thereon for a swinging movement more or less and a rocking movement of the box 9 on said yoke 17. Said carrier 19 is supported for said sliding movement on a frame 20, firmly bolted to the wall of said pit, having two oppositely-arranged overhanging borders 21, under which the edges of said carrier engage, as shown in Figs. 1, 2, and 3. A screw 22, having a hand-wheel thereon, as shown, screw-engaging the lower end of said frame 20, serves to move said carrier and said pulley upwardly for the purpose above set forth and to drop the latter away from the car-wheel when desired.

As above described, the wheel-rotating and the wheel-grinding devices in practice act in concert upon each car-wheel, and in Fig. 1 they are so shown, but in Fig. 2 for the purpose of illustration, as aforesaid, the grinding-wheel-supporting devices are shown separate from said wheel-rotating devices and are constructed and arranged to operate as follows and to a certain extent are regulated, as below described, by the said wheel-rotating devices: The grinding-wheel frame 34 is hinged by its lower end to the lower part of said plate D, as shown in Figs. 1 and 2, so that it may swing more or less to provide for conveniently moving the grinding-wheel to and away from the car-wheel—first, to bring it to working position, and, secondly, to carry it out of the way of any object which may be moving on said track. When said frame is swung against the side of the pit, as in Fig. 1, it is there fastened by bolts 33, engaging slotted extensions on opposite borders, as shown. Said frame 34 is provided with the below-named parts, of ordinary slide-rest construction—viz., a table *a*, having a gibbed connection with said frame for a sliding movement in a line with the track B, and a screw *b* for adjustably moving said table *a;* a second table *c*, having a gibbed connection upon said table *a* for a sliding movement across or at right angles to the movement of the latter, and a screw *d* for reciprocally moving said table *c*. Upon this last-named table are erected suitable bearing-boxes for the shaft 24, on which the grinding-wheel 23 is carried. On the last-named shaft is a pulley 25, which receives a belt from said driving-shaft 3, as shown. An ordinary double-acting ratchet-wheel 26 is secured on said screw *d*, and a swinging pawl-carrying lever 27 is also hung on said last-named screw, and on said lever is pivoted a double-acting pawl 28, which is actuated for reverse engagement with said ratchet by intermittent engagement with two guide-bolts 29, as usual, whereby said screw *d* has reverse movements imparted thereto, to the end that the table *c* and the grinding-wheel shall be given reciprocatory movements and the said wheel be moved back and forth across the tread of the wheel upon which it may be operating. Said pawl-carrying lever has its swinging movements imparted thereto by means of an eccentric 30 on said shaft 8, Fig. 2, and a connecting-rod 31, connected by one end to said eccentric by the usual strap 32 and having its opposite end connected to said lever 27, as shown in Figs. 1 and 2, by sleeves *e* and *f* and set-screws therein, whereby the extent of movement of said pawl 28, and consequently of the extent and speed of the feed movement of the wheel 23 across the car-wheel tread by the action of said screw *d* to move said table *c*, may be regulated.

It is believed that the foregoing description of the operation of the said wheel-grinding devices makes the same clear and that therefore no further description is necessary.

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

1. In a device of the class described, mechanism for sustaining the wheel of a car or analogous vehicle, and the end of an axle on which said wheel is carried in contact with the bearing thereof on said vehicle, and for imparting a rotary motion to said wheel and axle, comprising a shaft, a cylindrical element on said shaft for engagement with said wheel, means for imparting a rotary motion to said shaft and element, and for supporting said shaft and holding said element yieldingly

against said wheel, and a grinding-wheel and supporting devices therefor movable in the axial line of said axle, and at right angles thereto, and supporting said wheel in contact with said vehicle-wheel, and means automatically inducing the movements of said grinding-wheel in the direction of said axial line, substantially as described.

2. In a device of the class described, mechanism for sustaining the wheel of a car or analogous vehicle, and the end of an axle on which said wheel is carried in contact with the bearing thereof on said vehicle, and for imparting a rotary motion to said wheel and axle, comprising a shaft, a cylindrical element on said shaft for engagement with said wheel, means for imparting a rotary motion to said shaft and element and for supporting said shaft and holding said element yieldingly against said wheel, and a grinding-wheel, a frame carrying the last-named wheel, its shaft, and supports therefor, pivotally supported for a swinging movement whereby the grinding-wheel is swung from, and under said vehicle-wheel, means for holding the grinding-wheel in either position, and means for rotating the last-named wheel, substantially as described.

3. In a device of the class described, mechanism for sustaining the wheel of a car or analogous vehicle, and the end of an axle on which said wheel is carried, in contact with the bearing thereof on said vehicle, and for imparting a rotary motion to said wheel and axle, comprising the sliding carrier 19, means for adjusting said carrier vertically, a box-supporting yoke 17 having an arm entering a socket in said carrier, a spring yieldingly sustaining said yoke, a shaft-box 9, having trunnions engaging said yoke, and a yoke 12 having shaft-boxes thereon, combined with the shaft 8, supported in said boxes, a driving-shaft section 5, having a section 13 gear-connected with said shaft 8, and having the toggle connections K intermediate of said two sections, the car-wheel-engaging element 7, on said shaft 8, and means for rotating said shaft 5, substantially as set forth.

4. In a device of the class described, mechanism for sustaining the wheel of a car or analogous vehicle, and the end of an axle on which said wheel is carried, in contact with the bearing thereof on said vehicle, and for imparting a rotary motion to said wheel and axle, comprising the sliding carrier 19, means for adjusting said carrier vertically, a box-supporting yoke 17 having an arm entering a socket in said carrier, a spring yieldingly sustaining said yoke, a shaft-box 9, having trunnions engaging said yoke, and a yoke 12 having shaft-boxes thereon, combined with the shaft 8, supported in said boxes, a driving-shaft section 5, having a section 13 gear-connected with said shaft 8, and having the toggle connections K intermediate of said two sections, the car-wheel-engaging element 7, on said shaft 8, and means for rotating said shaft 5, the frame 34, the table *c* sliding on said frame, the shaft 24, and means for rotating the same and the wheel 23 thereon, the table-actuating screw *d*, and mechanism interconnected between said shaft 8 and said screw *d* for intermittently rotating said screw and imparting sliding movements to said table, substantially as set forth.

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