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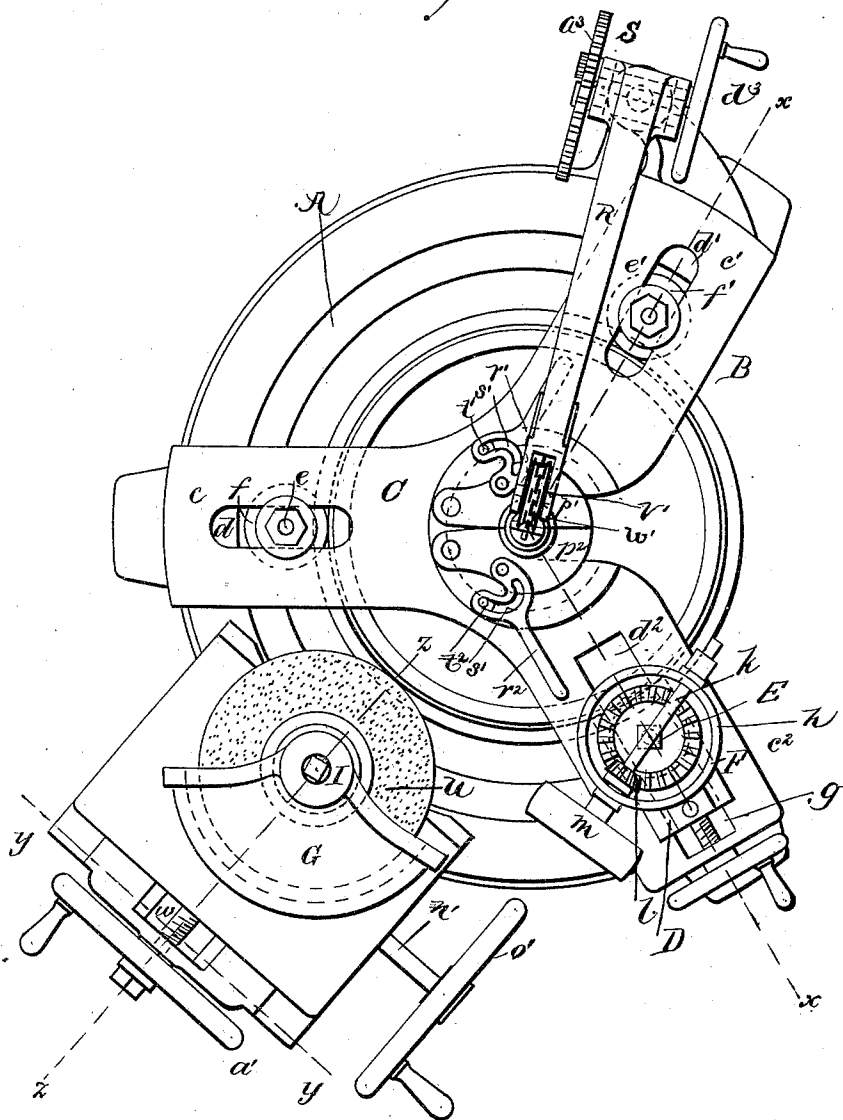
4 Sheets—Sheet 1.

I. R. TITUS.
GRINDING MACHINE.

No. 465,737.

Patented Dec. 22, 1891.

Fig. 1.



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ATTORNEYS

(No Model.)

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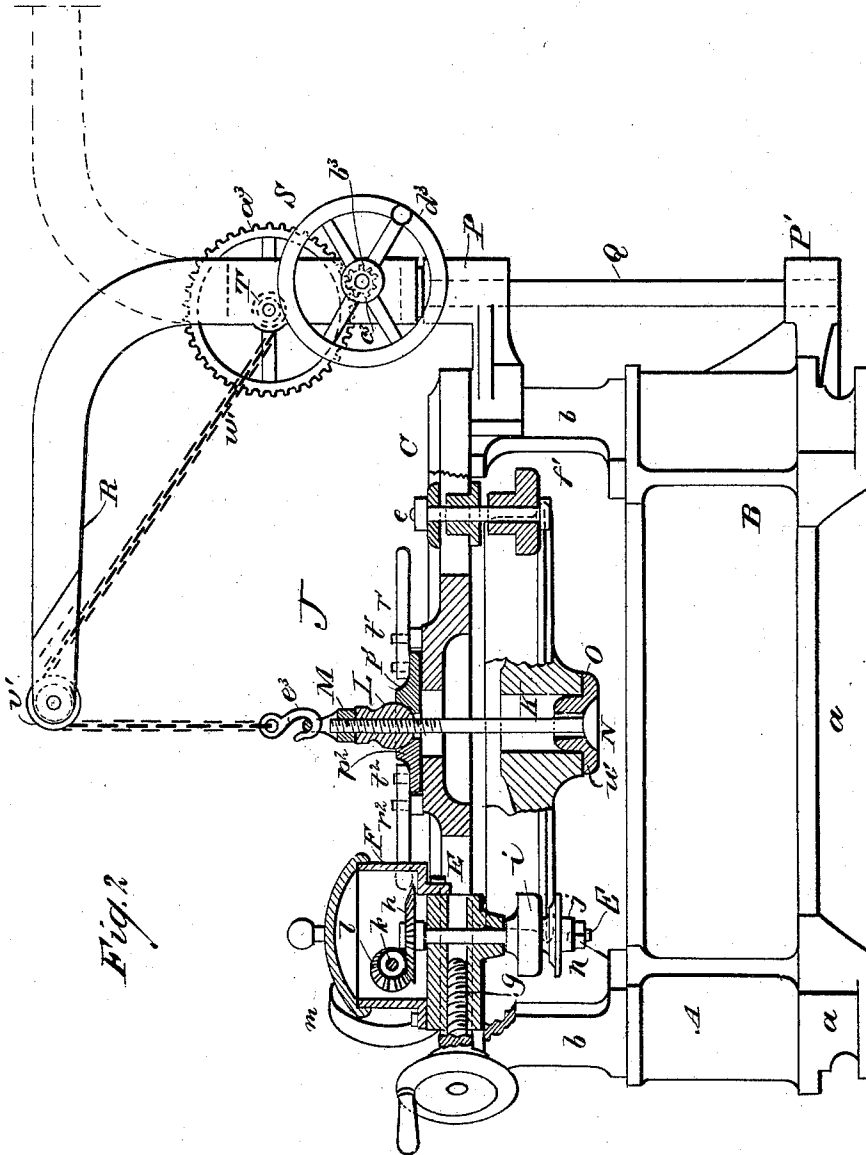


Fig. 2

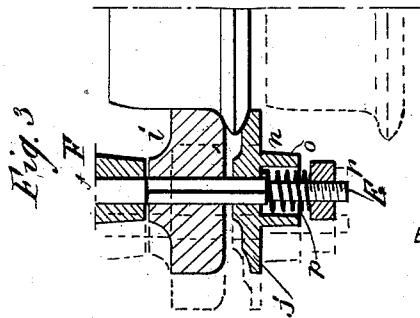


Fig. 3

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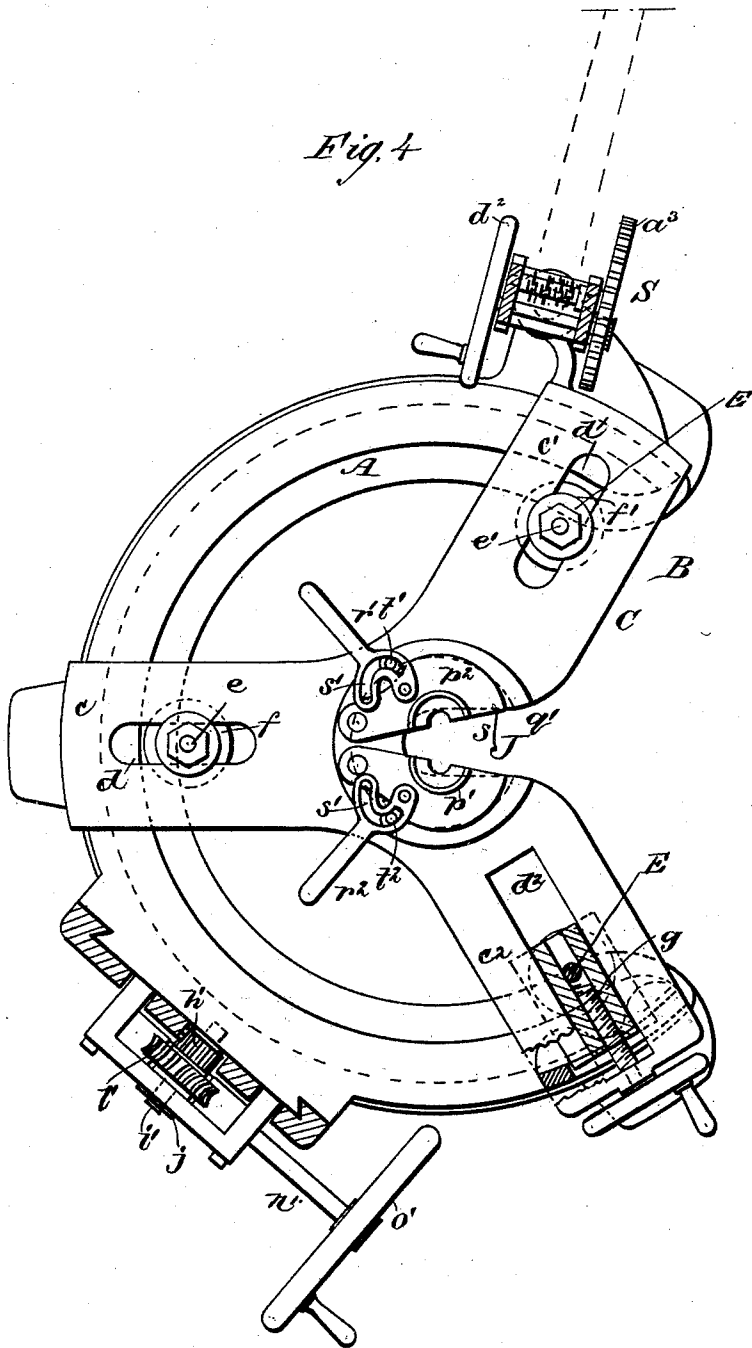
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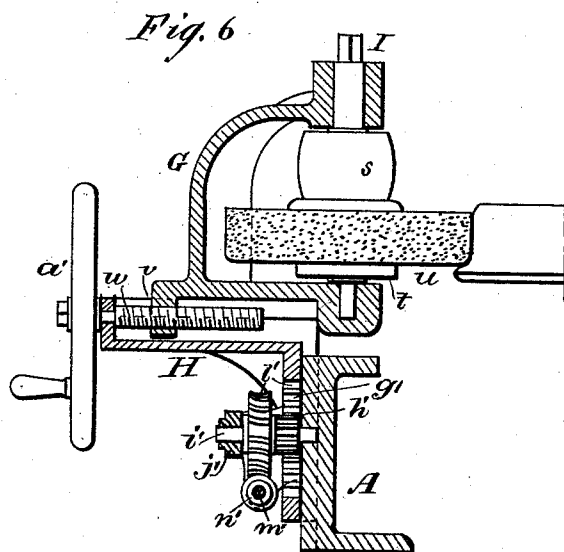
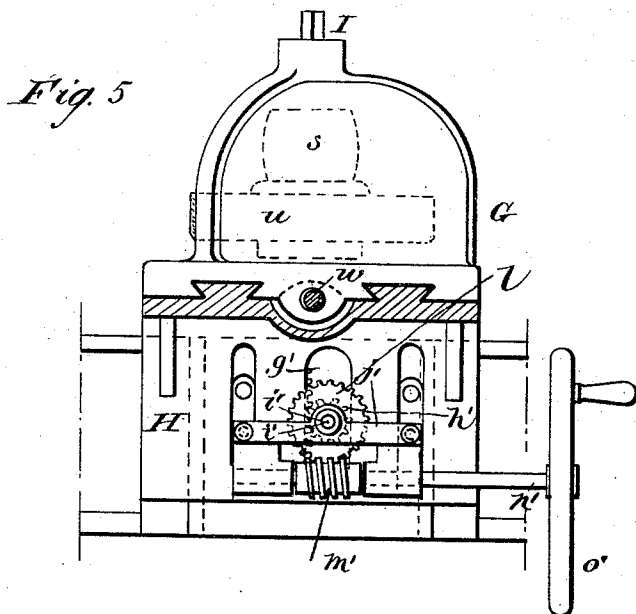
(No Model.)

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I. R. TITUS.
GRINDING MACHINE.

No. 465,737.

Patented Dec. 22, 1891.



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UNITED STATES PATENT OFFICE.

IVOR R. TITUS, OF HUNTINGTON, WEST VIRGINIA, ASSIGNOR TO HIMSELF AND ELY ENSIGN, OF SAME PLACE, AND FERDINAND E. CANDA, OF NEW YORK, N. Y.

GRINDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 465,737, dated December 22, 1891.

Application filed June 4, 1891. Serial No. 395,034. (No model.)

To all whom it may concern:

Be it known that I, IVOR R. TITUS, of Huntington, in the county of Cabell and State of West Virginia, have invented a new and Improved Grinding-Machine, of which the following is a specification, reference being had to the annexed drawings, forming a part thereof, in which—

Figure 1 is a plan view of my improved grinding-machine. Fig. 2 is a vertical section taken on line $x x$ in Fig. 1. Fig. 3 is a vertical transverse section of the clutch-wheel for revolving the wheel being ground. Fig. 4 is a horizontal section of the support of the grinding mechanism. Fig. 5 is a vertical transverse section taken on line $y y$ in Fig. 1, and Fig. 6 is a vertical transverse section taken on line $z z$ in Fig. 1.

Similar letters of reference indicate corresponding parts in all the views.

The object of my invention is to construct a simple and efficient machine for grinding the peripheries of car-wheels.

My invention consists in a rigid frame carrying a spider provided with three guiding-rolls, one of which is furnished with a clutch for engaging the flange of a car-wheel for rotating the same during the process of grinding, grinding mechanism provided with a wheel adjustable laterally and vertically, and means for suspending the wheel during the operation of grinding.

It also further consists in the combination, with the grinding-machine, of a crane for lifting and placing the wheel in the machine, all as will be hereinafter more fully described.

The body-casting A is made circular in form with a section removed, forming the opening B for the admission and removal of wheels or other articles to be ground. The casting A rests upon three supports a , which raise the machine to a height convenient for the operator. On the top of the body-casting A and bolted firmly thereto are three upright supports b , upon which rests the spider C, which is bolted firmly to each upright support. The spider C is provided with three arms $c c'$, the arms $c c'$ being provided with longitudinal slots $d d'$, in which are inserted and clamped the studs $e e'$, upon which are mounted the centering-rolls $f f'$. The third

arm c^2 is provided with a longitudinal slot e^2 , and the walls of the slot and the top and bottom of the arm c^2 are planed, forming a radial guide for the cross-head D, which is arranged to be moved back and forth by the screw g , swiveled in the end of the spider and entering a nut in the cross-head.

In the forward or inner end of the cross-head is journaled a vertical shaft E, provided at its upper end with a bevel-wheel h and at its lower end with a roll i , secured to the shaft and furnished with a friction-clutch j , which is presently to be described. The upper end of the shaft E and the bevel-wheel h are inclosed in a turret F, in which is journaled a shaft k , carrying a bevel-pinion l , which engages the bevel-wheel h . Upon the end of the shaft k , projecting through the side of the turret F, is mounted a pulley m for receiving the belt by which the shaft E is rotated. Upon the lower end of the shaft E, which is prolonged beyond the roll i , is loosely mounted a clutch-collar n , which is prevented from turning upon the shaft by means of a slot and feather. The clutch-collar n is provided with a chambered boss o , containing an aspiral spring p , which is pressed upwardly against the clutch-collar by a nut r , mounted on the threaded lower end of the shaft E. The upper surface of the clutch-collar n is concaved to adapt it to the inner surface of the car-wheel flange. The clutch thus constructed engages the flange of the wheel with a powerful friction, at the same time allowing irregularities to pass without straining any of the parts.

The turret F is provided with a cover, which excludes grit and dust from the gearing and from the bearings of the shaft.

The grinding mechanism is located on one side of the body-casting A, between the arms $c' c^2$ of the spider C. The hood-casting G is fitted to ways on the right-angled support H, which allows the hood to slide back and forth while preventing it from moving laterally. In a similar way the right-angled support H is fitted to ways on the body-casting A, so that it may be moved in a vertical direction.

In a hood-casting G is journaled an emery-wheel shaft I, the upper end of which projects through a bearing in the hood-casting

and is squared, the lower end being journaled in the lower part of the hood-casting. The said emery-wheel shaft I is provided with a pulley *s* and with a collar *t* for clamping the emery-wheel *u* in the position of use.

The hood-casting G is provided with a nut *v*, in which is inserted a screw *w*, journaled in the right-angled support H and furnished with a hand-wheel *a'*. By turning the said screw *w* the emery-wheel *u* is advanced toward the center of the machine, or moved in the opposite direction, according to the requirements of the work.

The vertical portion of the support H is slotted and provided with a rack *g'*, which is engaged by a pinion *h'*, secured to a shaft *i'*, journaled in a frame *j'*, secured to the body-casting A. Upon the same shaft is mounted a worm-wheel *l'*, which is engaged by a worm *m'* on the shaft *n'*, which is also journaled in the frame *j'*. The shaft *n'* is provided with a hand-wheel *o'*, by which it may be turned in one direction or the other to raise or lower the right-angled support H to adjust the emery-wheel *u* to the work being done.

The spider C is provided at the center with a center plate J, formed of the halves *p' p'*, pivoted to the spider at the rear of the slot *q'* in the spider which is opposite the center of the opening B in the body-casting A.

To the halves *p' p'* of the plate J are pivoted the levers *r' r'*, which are oppositely arranged with respect to each other and provided with curved slots *s'* for engaging the studs *t' t'* projecting from the spider. By moving the levers *r' r'* rearwardly the halves *p' p'* of the plate J are drawn apart. By moving said levers in the opposite direction the halves of the plate are forced together and locked.

The center of the plate is furnished with a central aperture for receiving the suspension-rod K. The said rod is provided with a ball L, which rests in a hemispherical cavity in the plate J, and with an eye-nut M on the upper end of the rod for receiving the hook of the chain belonging to the crane, presently to be described. The lower end of the rod K is furnished with a convex head N, to which is fitted a collar O, having a convex cavity adapted to fit the head of the rod K and provided with a flange *u'* for supporting the wheel while being ground.

At the side of the machine are arms P P', which are attached to or formed upon one of the standards *b* of the body-casting A. These arms are bored vertically to receive the shaft Q of the crane R, the said crane consisting of a right-angled arm secured to the shaft Q, provided in its free end with a sheave *v'* and having formed in its vertical portion a windlass S, consisting of the shaft or drum T, which receives the chain *w'*, the spur-wheel *a'*, mounted on the drum or shaft, the shaft *b'*, provided with the pinion *c'*, engaging the spur-wheel *a'*, and the hand-wheel *d'*, by which the crane is operated. The free end

of the chain *w'* is furnished with a hook *e'* for engaging the eye-nut M.

The operation of my improved machine is as follows: The levers *r' r'* are moved rearwardly, thus separating the halves *p' p'* of the plate J. The rod K is inserted in the wheel to be ground, and the eye-nut M is connected by the hook *e'* to the chain *w'*. The wheel is raised to the proper height, and the rolls *f f'* are adjusted with their peripheries removed from the center of the machine a distance equal to one-half the diameter of the wheel to be ground, the roll *i* being withdrawn a sufficient distance to admit of putting the wheel in the machine. When the wheel has reached a central position and is in contact with the rolls *f f'*, the halves *p' p'* of the plate J are closed and locked by moving the levers in the manner already described. The roll *i* is moved forward toward the center and brought into engagement with the periphery of the wheel by turning the screw *g*, and the clutch-plate *n* is brought into engagement with the flange, and the hook *e'* is detached from the eye-nut M. The shaft *k* being in motion, rotary motion is imparted to the roller *i*, thus revolving the wheel. The emery-wheel being set in motion is then moved forward and adjusted vertically, as may be required, to bring it into proper relation with the periphery of the wheel, when the operation proceeds until the wheel is reduced to a circular form.

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

1. In a grinding-machine, the combination, with a wheel-support, of guide-rolls and a driving-roll arranged to engage the periphery of the wheel, substantially as shown and described.

2. In a grinding-machine, the combination, with a wheel-supporting spider provided with a radial slot, of a perforated divided plate having its two parts pivoted to the spider, and means for swinging the halves of the plate, substantially as specified.

3. In a grinding-machine, the combination of a wheel-suspending rod, a spherical boss placed on the rod, and a divided and perforated plate provided with a spherical cavity for receiving the spherical boss, substantially as specified.

4. In a car-wheel-grinding machine, the combination, with the peripheral guide and drive rolls of the wheel-supporting rod K, having the convex head N, of the collar O, having a convex cavity for receiving the head of the rod, substantially as specified.

5. The combination, with the parts *p' p'* of the plate J, of the locking-levers *r' r'*, pivoted to the parts *p' p'* and furnished with the curved slots *s' s'*, and the fixed studs *t' t'*, projecting into the curved slots, substantially as specified.

6. The combination, with the drive-shaft E and driving-roll *i*, of the spring-pressed col-

lar *n* for engaging the flange of the car-wheel, substantially as specified.

7. In a grinding-machine, the combination, with the wheel-support, of guide-rollers *ff'*, the driving-roll *i*, provided with a clutch *j* for engaging the flange of the car-wheel, and the adjusting-screw *g* for moving the driving-roll, substantially as specified.

8. In a grinding-machine, the combination of the spider *C*, provided with adjustable guiding-rolls *ff'*, the cross-head *D*, fitted to ways in the spider, the shaft *E*, journaled in the cross-head and provided at its lower end with the drive-roll *i* and clutch *j* and at its upper end with the bevel-wheel *h*, the turret *F*, inclosing the bevel-wheel, and the shaft *k*, carrying the bevel-pinion *l* for driving the shaft *E*, substantially as specified.

9. The combination, with the wheel-support and wheel-revolving mechanism con-

structed as herein described, of vertically and laterally adjustable emery-wheels, of different sizes, for truing the peripheries of car-wheels, substantially as specified.

10. The combination, in a grinding-machine constructed as described, of the adjustable hood-casting *G*, containing the vertical shaft *I* and emery-wheel *u*, and the vertically-adjustable supporting-frame *H*, substantially as specified.

11. In a grinding-machine, the combination, with the revolving and grinding mechanism, of a crane and swivel-wheel-supporting rod for placing wheels in and removing them from the machine, substantially as specified.

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Witnesses:

E. ENSIGN,
R. B. PARRISH.