

(No Model.)

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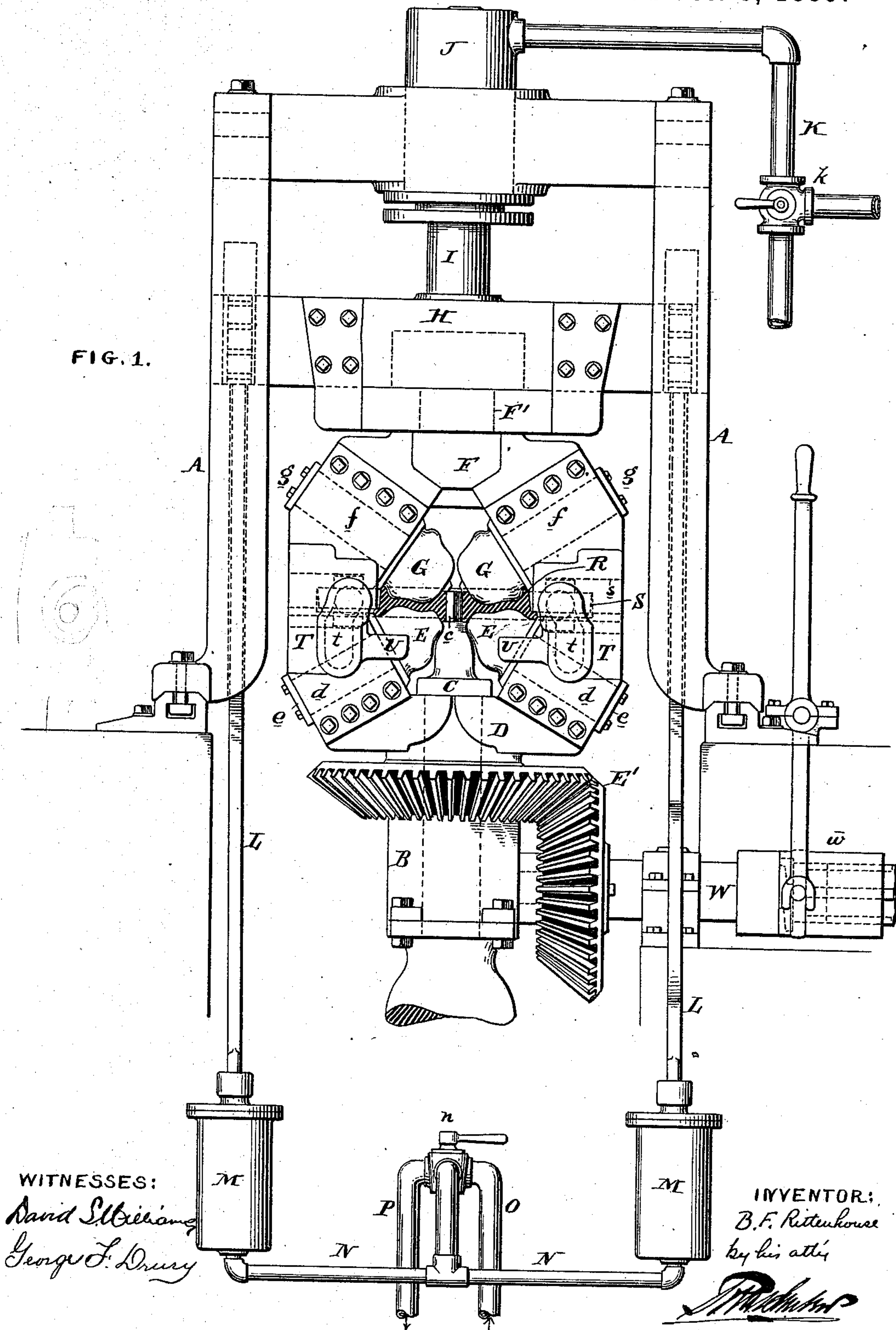
B. F. RITTENHOUSE.

ROLLING MILL FOR CAR WHEELS.

No. 412,415.

Patented Oct. 8, 1889.

FIG. 1.



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(No Model.)

2 Sheets—Sheet 2.

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FIG. 3.

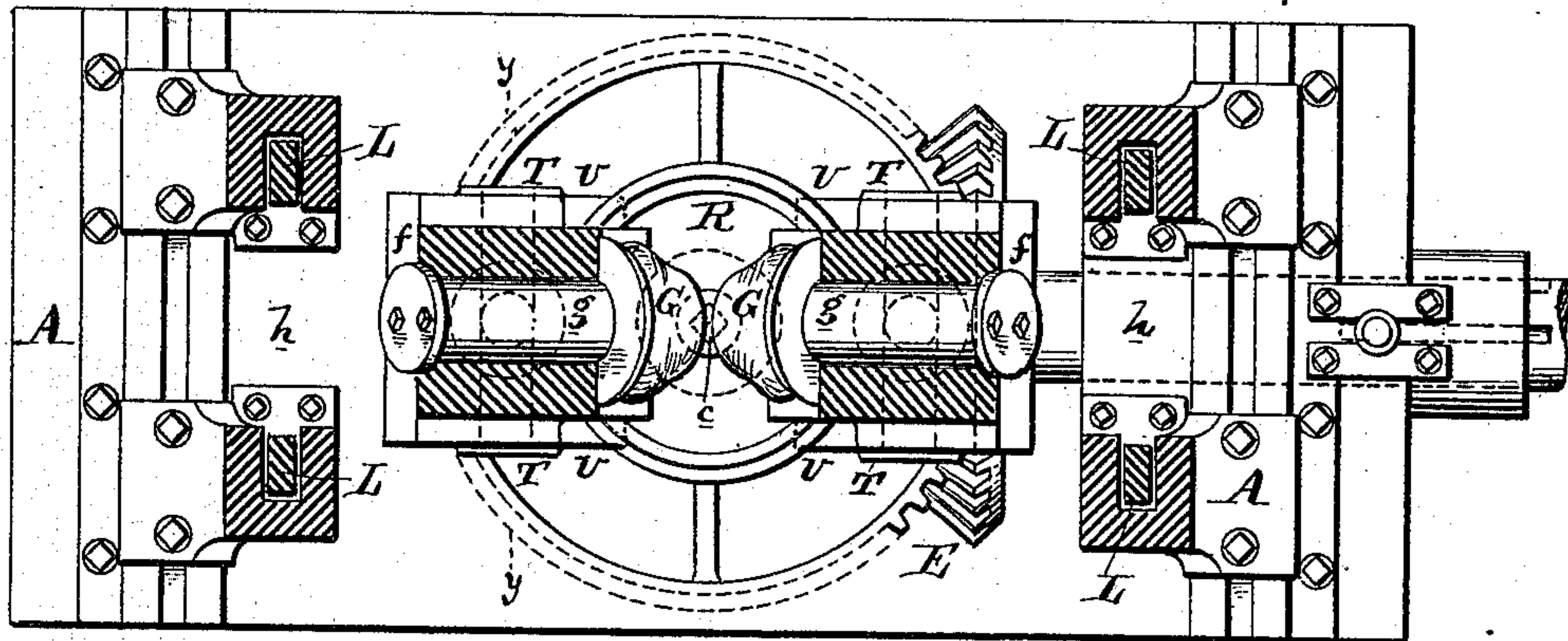


FIG. 2.

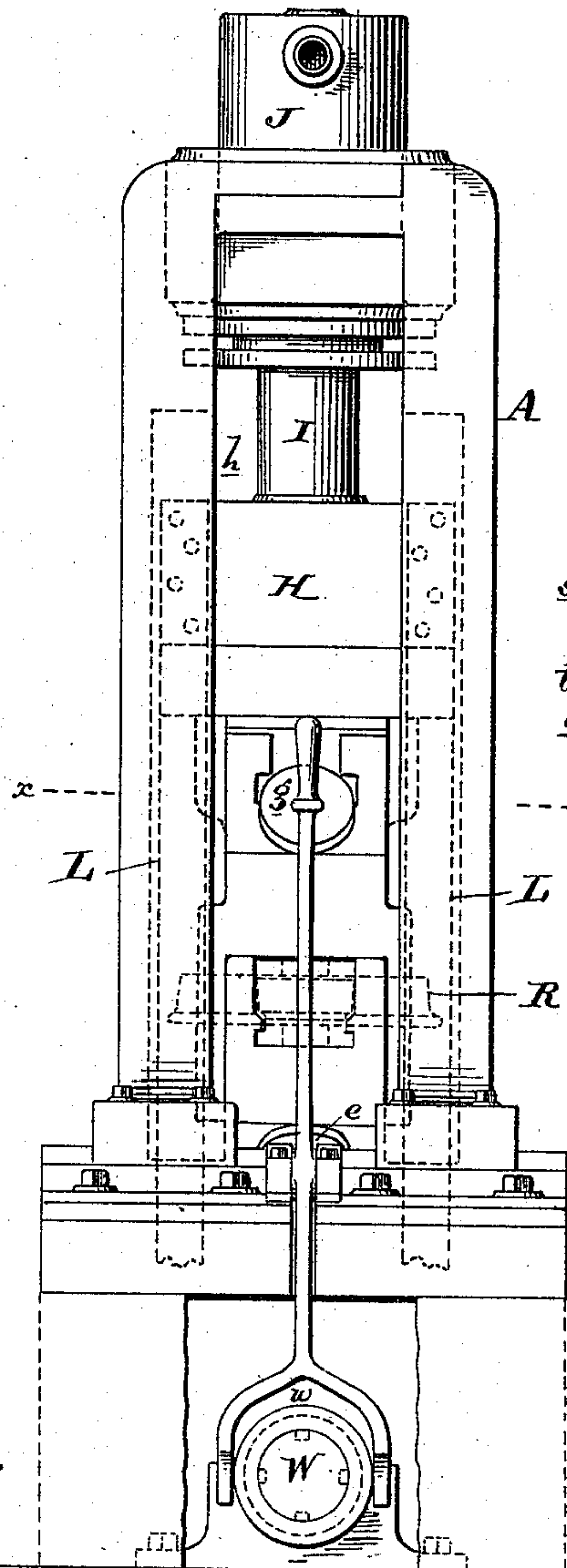
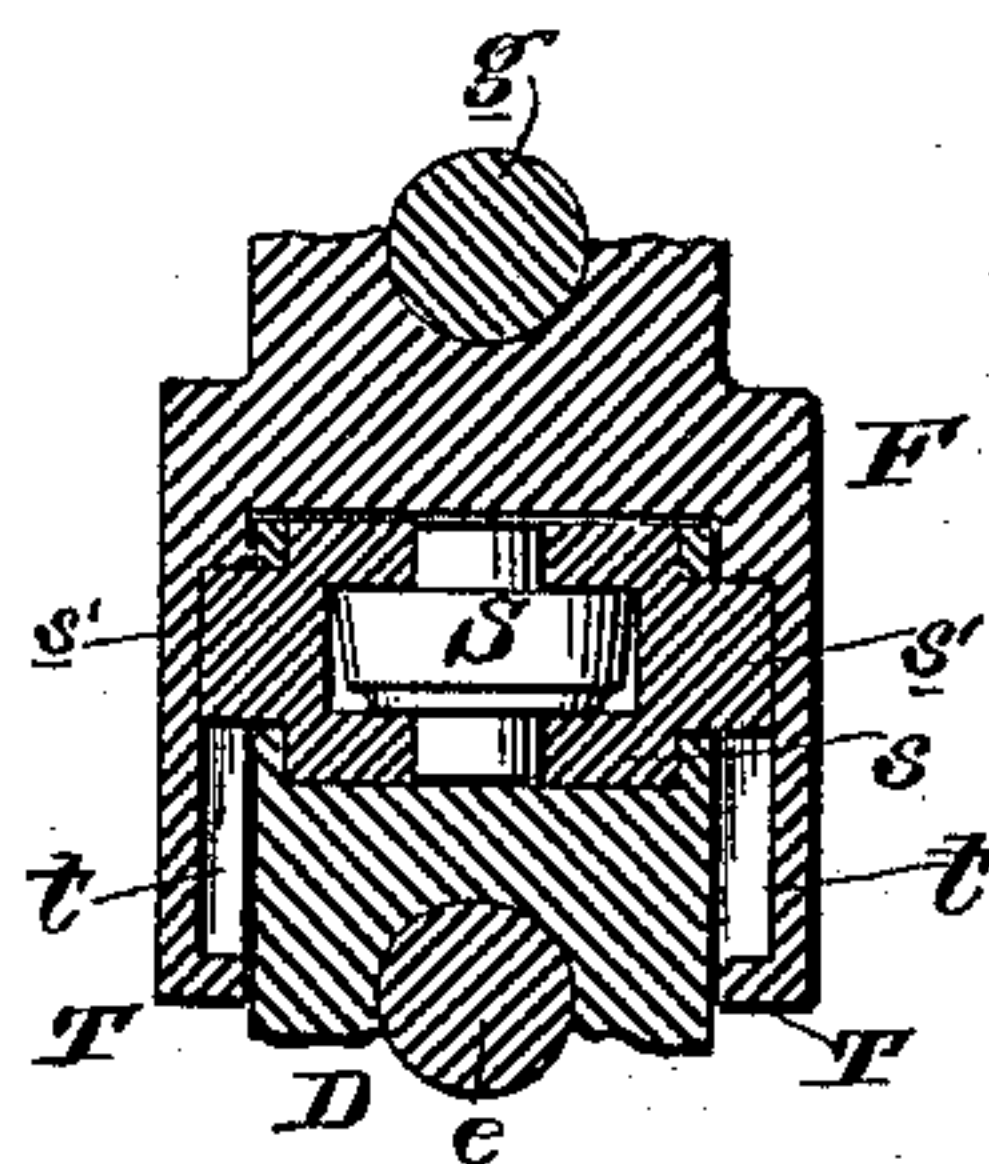


FIG. 4.



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UNITED STATES PATENT OFFICE.

BENJAMIN F. RITTENHOUSE, OF NORRISTOWN, PENNSYLVANIA.

ROLLING-MILL FOR CAR-WHEELS.

SPECIFICATION forming part of Letters Patent No. 412,415, dated October 8, 1889.

Application filed March 8, 1889. Serial No. 302,401. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN F. RITTENHOUSE, of Norristown, Montgomery county, State of Pennsylvania, have invented an Improvement in Rolling-Mills for Car-Wheels, of which the following is a specification.

My invention has reference to rolling-mills for rolling car-wheels; and it consists of certain improvements, which are fully set forth in the following specification and shown in the accompanying drawings, which form a part thereof.

In carrying out my invention I provide a suitable support adapted to sustain a car-wheel casting from its center and hold it in stationary position, and combine therewith a rotary frame in which are journaled peculiarly-shaped rolls adapted to press upon opposite faces of the car-wheel, said frames and rolls being rotated by means of suitable gearing or other power mechanism. There may be one or more rolls above and one or more rolls below the car-wheel, and the frames supporting said rolls are movable relatively to each other, so as to bring the rolls upon the opposite sides of the car-wheel closer together or move them farther apart. In addition to the rolls for rolling the faces of the car-wheel, there are one or more horizontal rolls, which are adapted to roll the flanges of the car-wheel, and these rolls are movable to and from the flange of the car-wheel and are adjusted by the relative movement between the two frames before mentioned. Provision is also made for separating the various rolls and lifting of the car-wheel automatically off its support into position to be removed. These are the essential features of the machine; but it is evident that in carrying them out the details may be modified in various ways.

I will now more particularly describe the invention, referring to the accompanying drawings, in which—

Figure 1 is a side elevation of a rolling-mill embodying my invention. Fig. 2 is an end elevation of same. Fig. 3 is a cross-sectional plan view on line $x x$ of Fig. 2, and Fig. 4 is a sectional elevation on line $y y$.

A is the housing or main frame of the machine.

B is a pedestal or base, which is stationary and arranged at the lower part of the hous-

ing. It is provided with an upwardly-extending stationary support C, having a square or rectangular shoulder part c , upon which the car-wheel R to be rolled is supported. By making the hole in the hub of the car-wheel square or otherwise irregular the wheel is retained against rotation upon its support. Journaled concentrically with this support and below the same is a rotary frame D, which receives motion from a power-shaft W and bevel-gears E'.

w is a clutch to stop or start the machine.

The frame D is provided with one or more oblique bearings d , in which are journaled the loose rolls E, having oblique axles e , arranged within the bearings d . The rolling portions of these rolls E are curved to correspond to the under face of the car-wheel and fit up close to the central stationary support C.

Arranged above the frame D and car-wheel and concentric therewith is a second rotary frame F, journaled in a movable cross-head H at F', which rotary frame is also provided with oblique bearings f , directed downward toward the center of the car-wheel. In these bearings are journaled the axles g of the upper rolls G, which are made to conform to the upper surface of the car-wheel. The upper rolls, owing to the peculiar shape of the car-wheel surface, are larger in diameter than the lower rolls and have preferably a greater obliquity to their axles, and this is permitted because the support C is arranged below the car-wheel. This upper frame has ears T, which project down upon each side of the lower frame D, and by this means the upper frame F and its rolls receive rotation with the lower frame D and its rolls, and so that the roll in the two frames, which are arranged one above the other, always remain in that relative position. These rolls are loosely journaled and rotate by the friction created between them and the car-wheel. The cross-head H, with the upper rolls and their frames, may be forced down by means of a hydraulic press J I, receiving liquid through the pipe K, provided with a controlling-valve k . The cross-head H, frame F, and rolls G G may be raised after completing the rolling of the wheel by rods L and hydraulic engines M M, which have pipes N connecting with a three-way valve n for receiving a supply of liquid

from pipe O and discharging into a pipe P. It is quite evident that various forms of power devices may be employed for moving this cross-head H.

5 *h* are guides in the housing, in which the cross-head works.

S are horizontal rolls adapted to roll the periphery or treading parts of the car-wheel R, and are journaled in sliding blocks *s*, Fig. 10 4, which are provided with pins *s'* projecting laterally from each side. These blocks or slides *s* are carried by the lower frame D, and the pins *s'* project into cam-slots *t* on the ears T, the said cam-slots being so shaped that a 15 downward movement of the frame F will force the rolls *S* against the periphery of the car-wheel, and an upward movement of said frame will cause the rolls *S* to move away from said car-wheels. The lower parts of the ears T 20 are provided with projections U, which normally are under the car-wheel and at some slight distance below it, the function of which is to lift the car-wheel off the central support *c* after the completion of the rolling, and also 25 to deliver a new casting or blank into position to be rolled.

The operation will now be understood. A car-wheel being in the position shown, the rolls G G and E E and S S are carried around 30 the stationary car-wheel by the frames D and F, and as the pressure is exerted by hydraulic press J I all of the rolls have a tendency to approach upon the car-wheel and reduce its thickness while rotating around it. 35 After the car-wheel is fully rolled the cross-head, with its frame F and connections, is lifted. This causes the rolls G G to move upward away from the car-wheel and the rolls S S to be moved laterally away from the 40 tread of the car-wheel, and the frame F in its upward movement causes the projections U thereof to lift the car-wheel clear of the support *c* and leave it in position to be withdrawn from between the rolls.

45 It is evident that while the details shown are well adapted to the purpose they may be modified without departing from the spirit of the invention.

Having now described my invention, what I 50 claim as new, and desire to secure by Letters Patent, is—

1. In a rolling-mill for rolling car-wheels, a support for the car-wheel, whereby the wheel is held stationary, in combination with rolls 55 arranged above and below the car-wheel, and power mechanism to cause said rolls to revolve around the center of the car-wheel.

2. In a rolling-mill for rolling car-wheels, a stationary support for the car-wheel, whereby 60 the wheel is held stationary, in combination with rolls arranged above and below the car-wheel and between the hub of the wheel and periphery, rolls arranged about the periphery of the car-wheel and between the plane of the 65 upper and lower rolls for rolling the tire or tread portion of the wheel, and power mech-

anism to cause said rolls to revolve around the center of the car-wheel.

3. In a rolling-mill for rolling car-wheels, a support for the car-wheel, whereby the wheel 70 is held stationary, in combination with rolls arranged above and below the car-wheel, power devices to move said rolls toward or from each other, and power mechanism to cause said rolls to revolve around the center 75 of the car-wheel.

4. In a rolling-mill for rolling car-wheels, the combination of a central stationary support for the car-wheel, whereby the wheel is 80 held stationary, with two rotary frames and one or more rolls carried in each frame and caused thereby to revolve around the central support and each made to conform in shape to the correspondingsurfaces of the car-wheel 85 to be rolled.

5. In a rolling-mill for rolling car-wheels, the combination of a central stationary support for the car-wheel, whereby the wheel is 90 held stationary, with two rotary frames, one or more rolls carried in each frame and caused thereby to revolve around the central support and each made to conform in shape to the corresponding surfaces of the car-wheel 95 to be rolled, a connection between the two frames, and power devices to move said frames to or from each other.

6. In a rolling-mill for rolling car-wheels, the combination of a central stationary support for the car-wheel, whereby the wheel is 100 held stationary, with two rotary frames, one or more rolls carried in each frame and caused thereby to revolve around the central support and each made to conform in shape to the corresponding surfaces of the car-wheel 105 to be rolled, a connection between the two frames, power devices to move said frames to or from each other, and one or more rolls carried by said frames and arranged to roll the periphery of the car-wheel.

7. In a rolling-mill for rolling car-wheels, the 110 combination of a central stationary support for the car-wheel, whereby the wheel is held stationary, with two rotary frames, one or more rolls carried in each frame and caused thereby to revolve around the central support and 115 each made to conform in shape to the corresponding surfaces of the car-wheel to be rolled, a connection between the two frames, power devices to move said frames to or from each other, one or more rolls carried by said 120 frames and arranged to roll the periphery of the car-wheel, a slide supporting each said last-mentioned rolls on one of the frames, and cam mechanism carried by the other frame 125 to operate the slide to move the said last-mentioned rolls to or from the periphery of the car-wheel.

8. In a rolling-mill for rolling car-wheels, the combination of a central stationary support for the car-wheel, whereby the wheel is 130 held stationary, with two rotary frames, one or more rolls carried in each frame and caused

thereby to revolve around the central support and each made to conform in shape to the corresponding surfaces of the car-wheel to be rolled, a connection between the two frames, power devices to move said frames to or from each other, one or more rolls carried by said frames and arranged to roll the periphery of the car-wheel, a slide supporting each said last-mentioned rolls on one of the frames, cam mechanism carried by the other frame to operate the slide to move the said last-mentioned rolls to or from the periphery of the car-wheel, and wheel-lifting devices operated by the last-mentioned frame to lift the wheel off its support simultaneously with the separations of the rolls.

9. In a rolling-mill for rolling car-wheels, the combination of a central stationary support for the car-wheels, whereby the wheel is held stationary, with two rotary frames, one or more rolls carried in each frame and caused thereby to revolve around the central support and each made to conform in shape to the corresponding surfaces of the car-wheel to be rolled, power mechanism to reciprocate one of said frames and its rolls with respect to the other frame and its rolls, and wheel-lifting devices moved with said reciprocating frame to lift the wheel off its central support when the rolls are separated.

10. The combination of a stationary support for a car-wheel casting or blank, whereby the wheel is held stationary, with a rotating frame, and one or more rolls carried thereby and made to conform to the curvature of the car-wheel face to be rolled and caused to revolve around the stationary support and car-wheel.

11. The combination of a stationary support for a car-wheel casting or blank, whereby the wheel is held stationary, with a rotating frame, and one or more loose or idler rolls having oblique axes and carried thereby and made to conform to the curvature of the car-wheel face to be rolled and caused to revolve around the stationary support and car-wheel.

12. The combination of a central support for a car-wheel casting or blank, whereby the wheel is held stationary, a rotary frame above and another below said support and car-wheel, supported thereby and concentric with respect therewith, and rolls having rolling ends made to conform to the faces of the car-wheel and journaled on axles arranged obliquely in

the plane of rotation of the frames, whereby said rolls are caused to revolve about the axis of the wheel and also about their own oblique axis.

13. The combination of a central support for a car-wheel casting or blank, whereby the wheel is held stationary, a rotary frame above and another below said support and car-wheel, supported thereby and concentric with respect therewith, and rolls having rolling ends made to conform to the faces of the car-wheel and journaled on axles arranged obliquely in the plane of rotation of the frames, whereby said rolls are caused to revolve about the axis of the wheel and also about their own oblique axis and in which the obliquity of the axles of the rolls of one frame is greater than that of the axles of the rolls of the other frame.

14. The combination of a central support for a car-wheel casting or blank, whereby the wheel is held stationary, a rotary frame above and another below said support and car-wheel, supported thereby and concentric with respect therewith, rolls having rolling ends made to conform to the faces of the car-wheel and journaled on axles arranged obliquely in the frames, whereby said rolls are caused to revolve about the axis of the wheel and also about their own oblique axis, and power mechanism to force said frames and their rolls toward each other.

15. The combination of a central stationary car-wheel support, whereby the wheel is held stationary, a rotary frame adapted to travel around said support, and one or more rolls carried thereby for rolling the periphery or tread of the car-wheel, whereby said rolls are caused to revolve about said car-wheel.

16. The combination of a central stationary car-wheel support, whereby the wheel is held stationary, a rotary frame adapted to travel around said support, one or more rolls carried thereby for rolling the periphery or tread of the car-wheel, whereby said rolls are caused to revolve about said car-wheel, and power devices to move said rolls toward or from the car-wheel.

In testimony of which invention I hereunto set my hand.

B. F. RITTENHOUSE.

Witnesses:

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E. M. BRECKINREED.