

No. 611,793.

Patented Oct. 4, 1898.

E. ROBERTS & J. DAVIS.

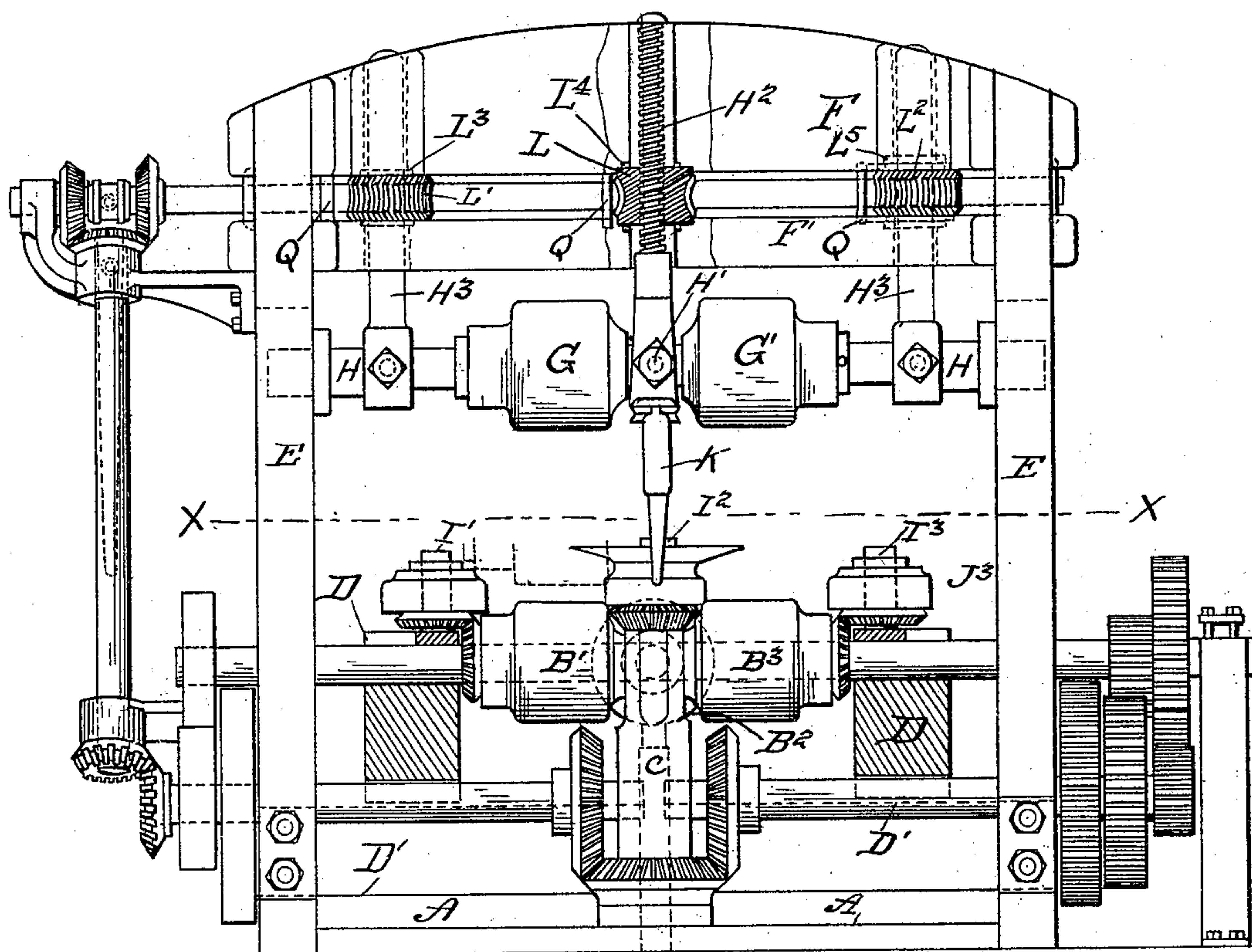
APPARATUS FOR ROLLING RAILWAY CARRIAGE WHEELS.

(Application filed Dec. 27, 1897.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1.



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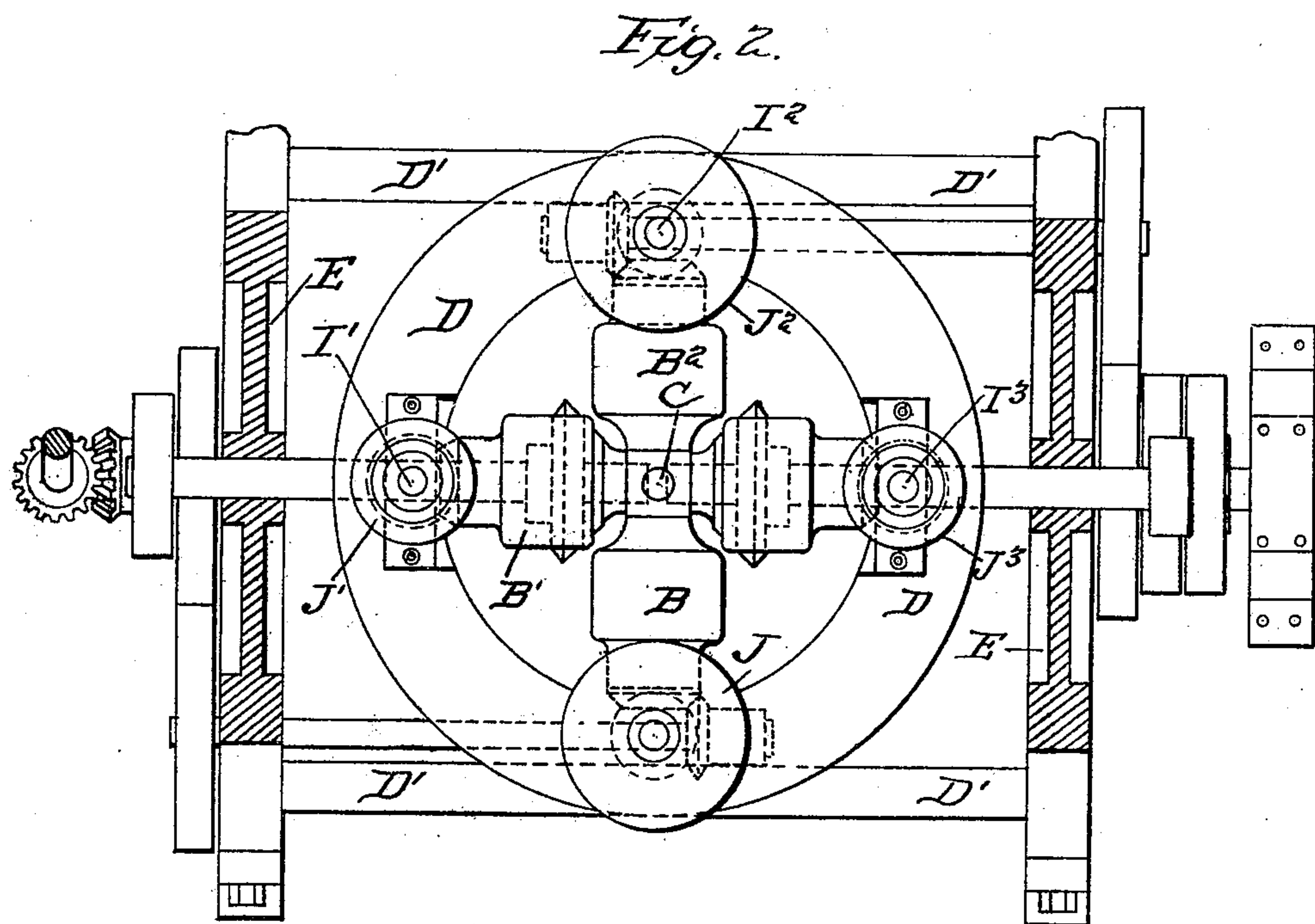
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3 Sheets—Sheet 2.



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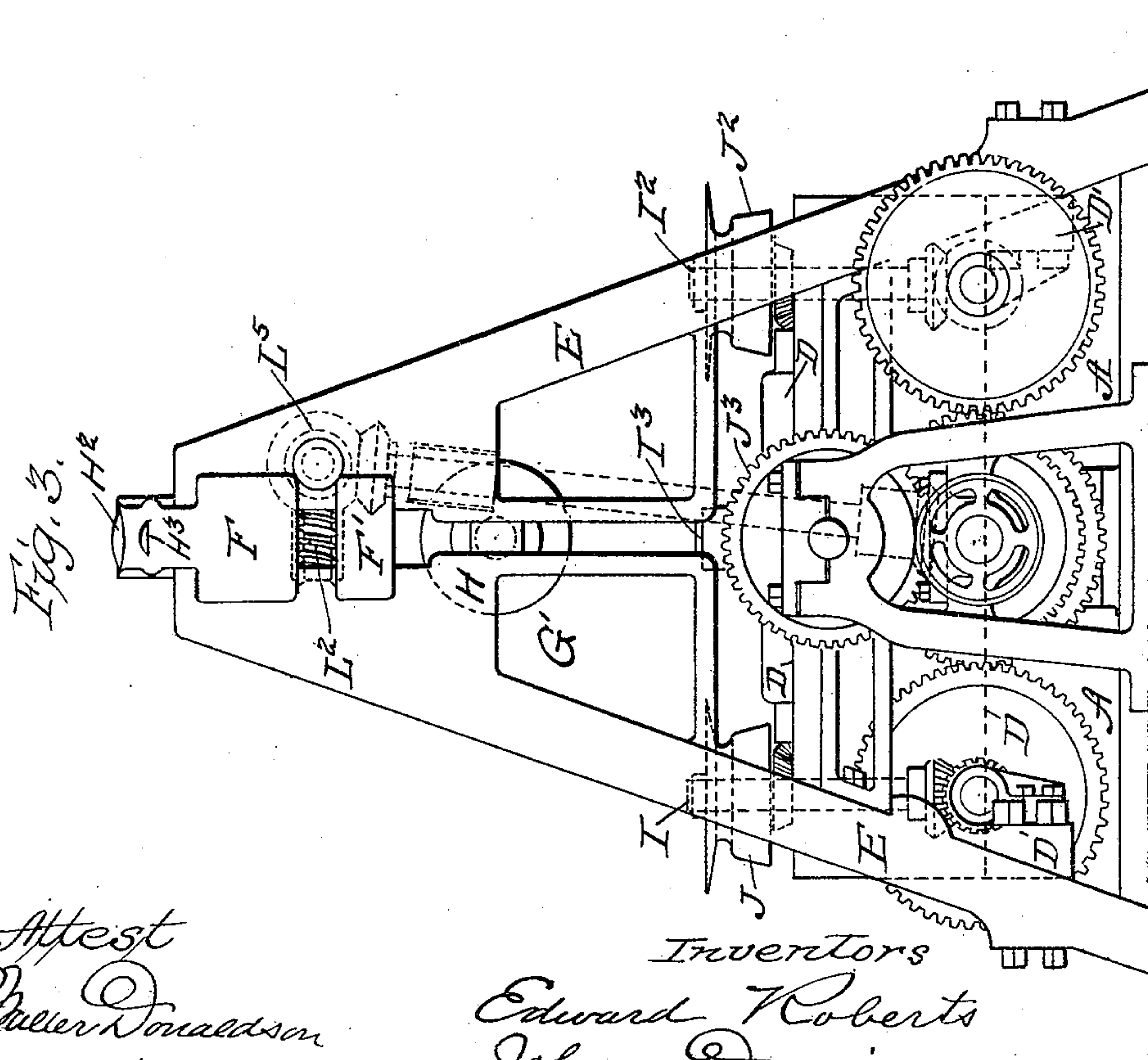
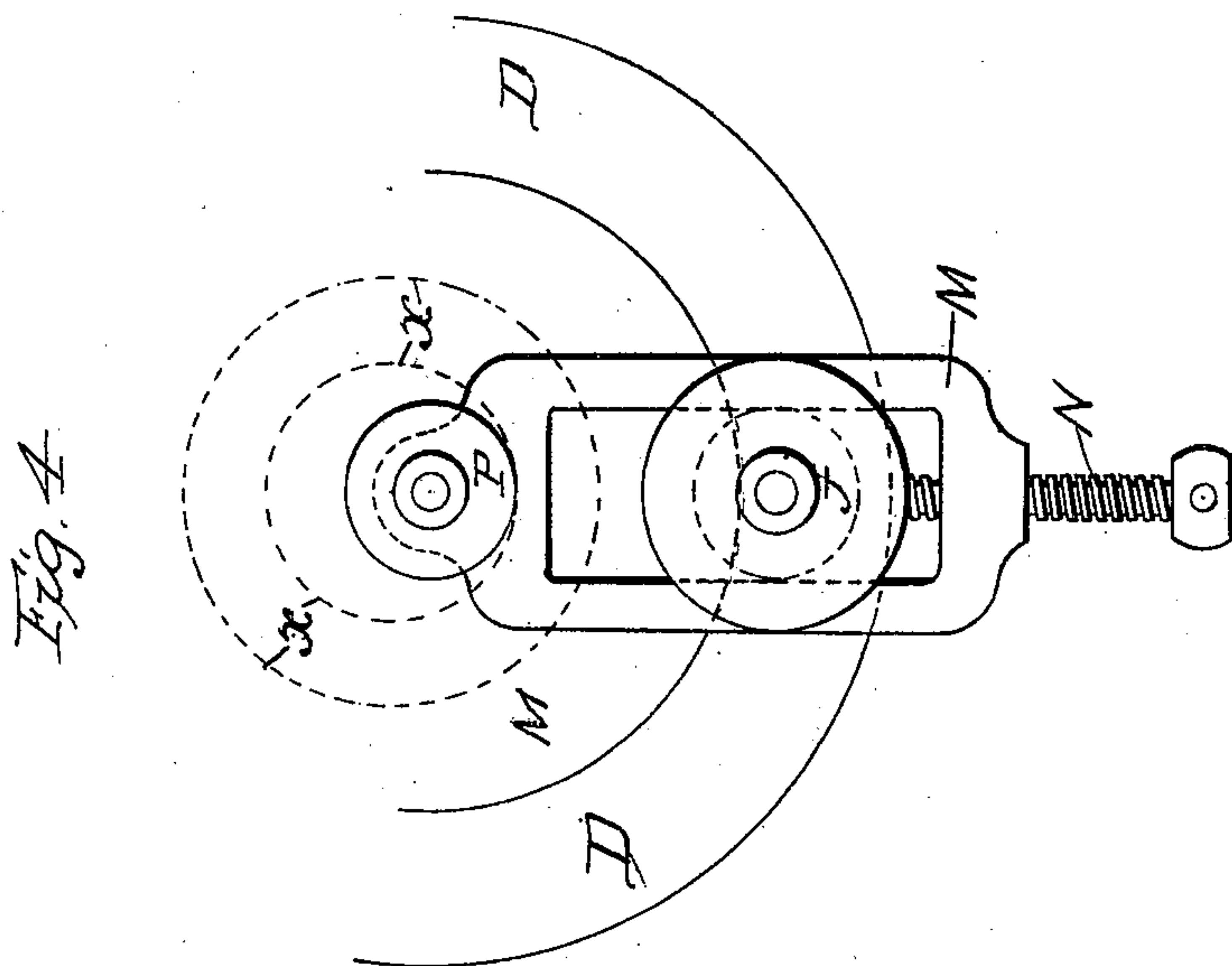
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3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

EDWARD ROBERTS AND JOHN DAVIS, OF MOTHERWELL, SCOTLAND, AS-
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APPARATUS FOR ROLLING RAILWAY-CARRIAGE WHEELS.

SPECIFICATION forming part of Letters Patent No. 611,793, dated October 4, 1898.

Application filed December 27, 1897. Serial No. 663,551. (No model.) Patented in England January 12, 1897, No. 814.

To all whom it may concern:

Be it known that we, EDWARD ROBERTS, foreman smith, 10 Orbiston street, and JOHN DAVIS, smith, 49 Miller street, Motherwell, in the county of Lanark, Scotland, have invented certain new and useful Improvements in Apparatus for Rolling Railway-Carriage Wheels, Wheel-Centers, and Flanged Tires, (which have been patented in Great Britain by Letters Patent dated January 12, 1897, No. 814,) of which the following is a specification.

This invention relates to apparatus designed especially for rolling out railway-wheels from solid billets of iron or mild steel, but which is applicable also for rolling out wheel-centers or wheels without tires and also flanged tires.

The invention is illustrated by the accompanying drawings, in which—

Figure 1 is a vertical section; Fig. 2, a horizontal section on the line xx , Fig. 1; and Fig. 3 is an end view of the apparatus for rolling railway-carriage wheels, wheel-centers, and flanged tires. Fig. 4 is a view of a detail used when the flanged tire only is being rolled.

The apparatus is composed of a framing or bed A, on which is carried a central roll of cup shape upon a vertical rotating spindle and having disposed radially around it a number of rolls B B' B² B³ on horizontal axes, or the central roll may be dispensed with and the cup be formed, as shown, by the ends of the horizontal rolls abutting against a central vertical hollow bracket C, which carries the inner ends of the rolls. There are preferably four rolls B B' B² B³, arranged in two pairs in the form of a cross around the central vertical bracket C and carried in suitable bearings at their outer ends in a ring D, supported by cross-beams D' from the standards E of the framing. The upper part of the machine-frame is formed by the side standards E and a cross beam or beams F F', as in an ordinary rolling-mill, and under the lower cross-beam two rolls G G' are fitted immediately over and with their axes in the same vertical plane as the axes of the pair of under rolls B' B³. The upper rolls G G' are fitted to run loosely upon separate axles H, jointed at the center on a stud H', carried by

a screw H², the outer ends of the axles being also jointed to screws H³, all of which pass down through the beams F F', so that the rolls G G' may not only be raised and lowered, but may be lowered at the center first and thereafter at their outer ends. Disposed around the lower horizontal rolls B B' B² B³ and centered on vertical studs or spindles I I' I² I³ in a circular row on the ring D of the machine are a number of small guide-rolls J J' J² J³, two of which, J J², are preferably formed of two parts resting upon each other, as shown. All of these rolls may be rotated by gearing, as shown, or one or more of which on each side may be thus rotated, while the others merely serve as guides around the periphery or tire of the wheel being rolled.

The several rolls together constitute eight pairs of rolls, taken as follows: Each of the rolls J J², because of its two portions, is in itself a pair, while the four horizontal rolls B B' B² B³ constitute pairs with the rolls J J' J² J³, and the rolls G G' form pairs with the rolls J' J³. The rolls are turned to such contours that when brought together in the position they occupy in rolling out the wheel, as shown by the dotted lines, Fig. 1, a vertical section through the rolls will show a space between them corresponding to the section of the wheel rolled out by them, the nave, hub, or boss of the wheel being formed by the central vertical bracket C and the ends of the upper horizontal rolls G G' and the lower horizontal rolls B B' B² B³, or by the central vertical cup-roll, when such is used, the web between the body of the upper and lower horizontal rolls G G' and B B' B² B³, and the flange or tire between the outer neck of these latter rolls and the outer row of small vertical rolls J J' J² J³. The rolls may be interchangeable, so that practically any shape or size of wheel may be rolled in the machine.

In the operation of the machine a heated billet of iron or steel is placed in the cup of the central vertical roll or upon the upper end of the central bracket C, a removable spindle or punch K, with or without a shaping disk or flange, being passed through a hole in the billet and suspended from the axle of the upper or movable horizontal rolls

to form an eye in the billet. The spindle K also passes down into and is guided by the hollow central bracket C, up through which a stream of water to cool the punch passes, 5 the water escaping by the bearings in the bracket C. The billet is gradually pressed out by lowering the top rollers G G', so that it first fills up the cup in the central roll or the cup formed by the inner ends of the horizontal rolls and the end of the bracket C to 10 form the boss and then spreads out to form the web of the wheel, pressure being applied first at the center in order to press up the boss. Then as the top rails G G' are lowered 15 toward the outer ends the metal is forced outward to fill the space between the horizontal rolls G G' and B B' B² B³, at their outer ends, and the vertical guide-rolls J J' J² J³ until the outer ends of the upper horizontal 20 rolls G G' meet the upper ends of the vertical guide-rolls J J' J² J³, which point coincides with the periphery of the finished wheel, whose tire is formed by suitably shaping the outer ends of the horizontal rolls B B' B² 25 B³ and G G' and the vertical guide-rolls J J' J² J³. When the wheel is thus rolled out, the upper rolls G G' are raised and the wheel is lifted by means of the central spindle K, which after removal of the finished wheel 30 from the machine is driven out.

The raising and lowering of the upper rolls may be effected by hand-screws or by hydraulic pressure or other means; but by preference screws are used, and they are or may 35 be operated by gearing from the gear which drives the lower rolls. As shown by the drawings, the screws H² H³ are fitted with worm-wheels L L' L², which rotate between the beams F F' and act as nuts to traverse 40 the screws vertically, these worm-wheels being driven by worms L³ L⁴ L⁵ on a shaft capable of having its direction of rotation re-

versed, said worms being loose upon the shaft and clutched thereto at the proper times by clutches Q, the inner clutch being operated 45 by a different lever from that which operates the two end clutches. When only a wheel center is to be rolled without a tire, the rolls are shaped to suit the altered form of the finished article, the billet being placed, as 50 above described, on the central vertical cup-roll or on the bracket C. When a tire alone is to be rolled, the billet is first punched or pressed into ring form, as shown at *a*, Fig. 4, and a frame M, such as shown at Fig. 4, 55 capable of movement by means of a screw N, brings the ring-shaped billet against the outer vertical circular row of guide-rolls J J' J² J³, which are shaped to the contour of the finished tire, a roll P, carried on the frame M, 60 forming the inner periphery of the tire.

Having now described the invention, what we claim, and desire to secure by Letters Patent, is—

In apparatus for rolling railway-carriage 65 wheels, wheel-centers and flanged tires, the combination of horizontal rolls B, B', B², B³, in the form of a cross, guide-rolls J, J', J², J³, situated in proximity to the outer ends of the horizontal rolls and upper rolls G, G', capable 70 of having their inner ends lowered first in order to press up the boss of the wheel and gradually spread the metal out to fill the space formed by the outer ends of the horizontal rolls and the guide-rolls substantially 75 as described.

Signed at Glasgow, in the county of Lanark, Scotland, this 11th day of December, 1897.

EDWARD ROBERTS.
JOHN DAVIS.

Witnesses:

WALLACE FAIRWEATHER,
JNO. ARMSTRONG, Jr.