

No. 706,674.

Patented Aug. 12, 1902.

H. V. LOSS.

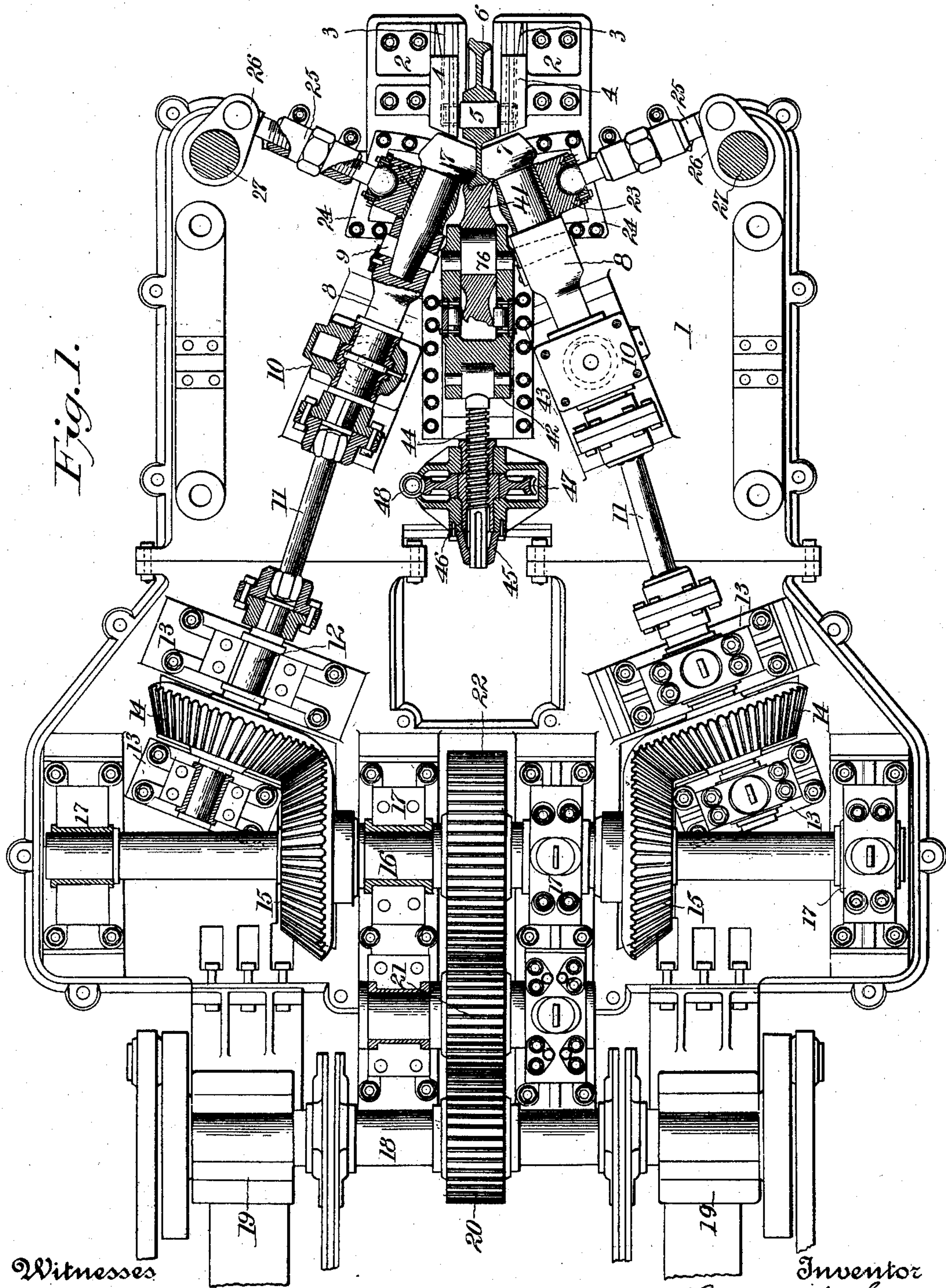
MACHINE FOR ROLLING CAR WHEELS.

(Application filed Mar. 7, 1902.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1.



Witnesses

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Fig. 4.

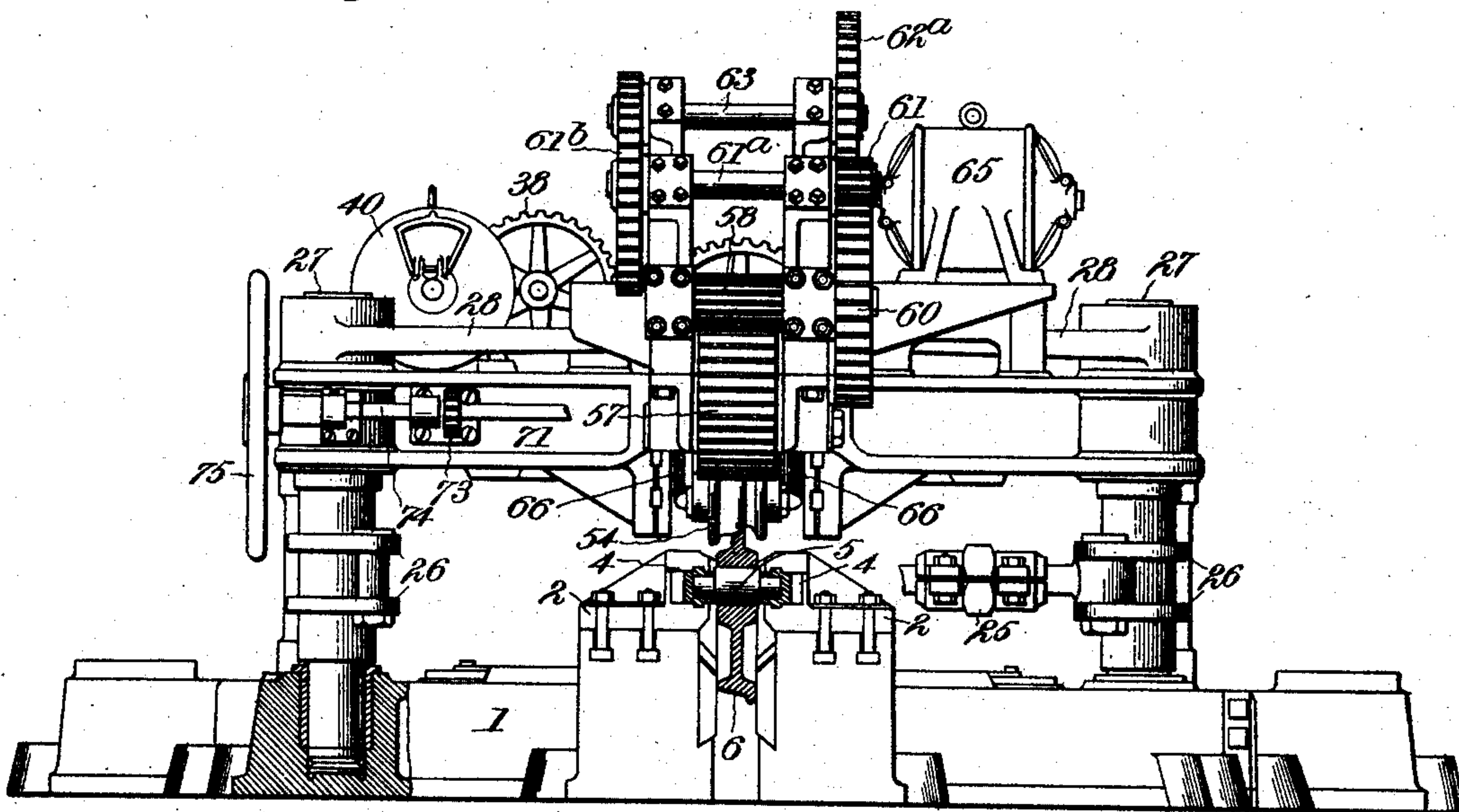


Fig. 5.

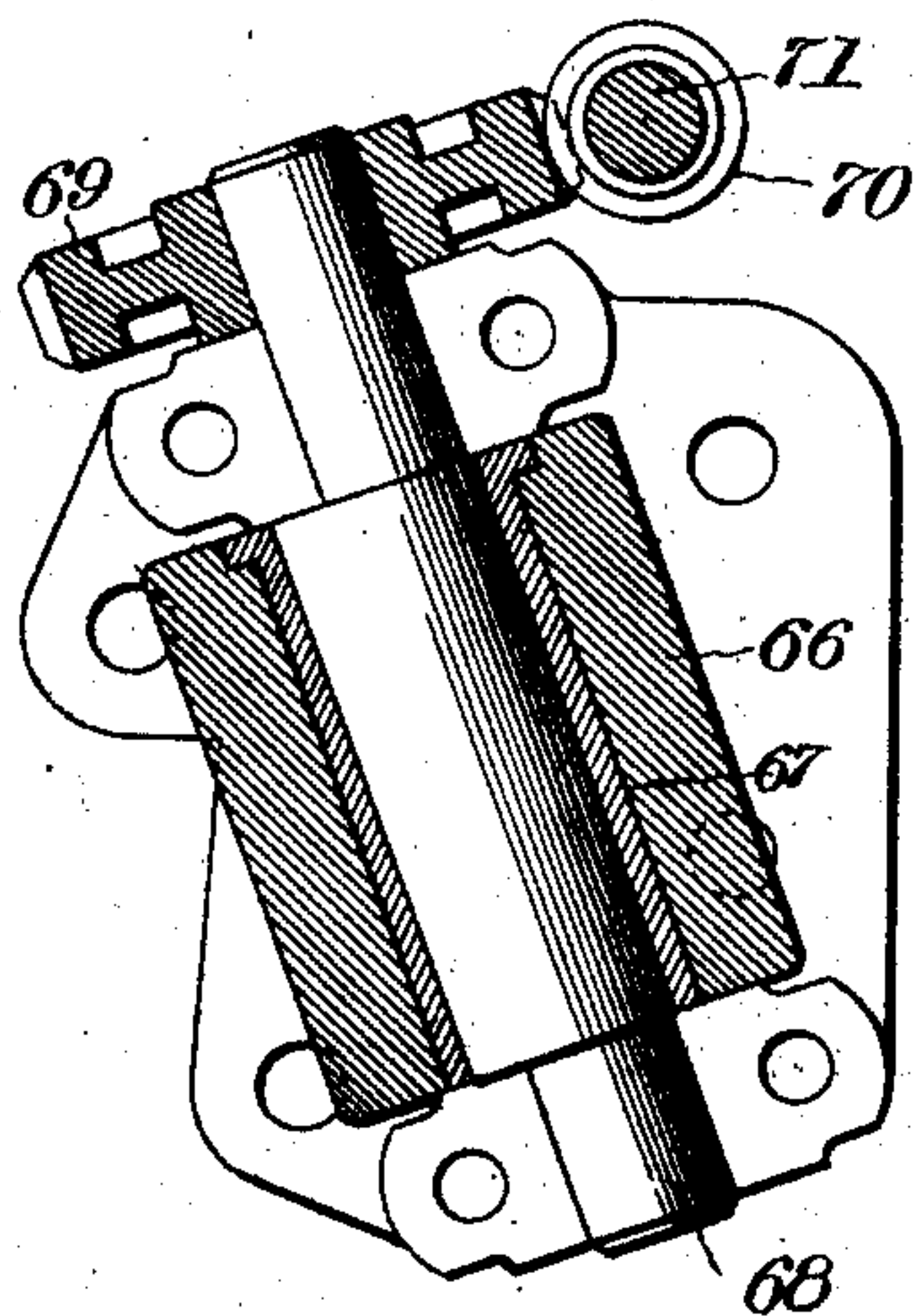


Fig. 7.

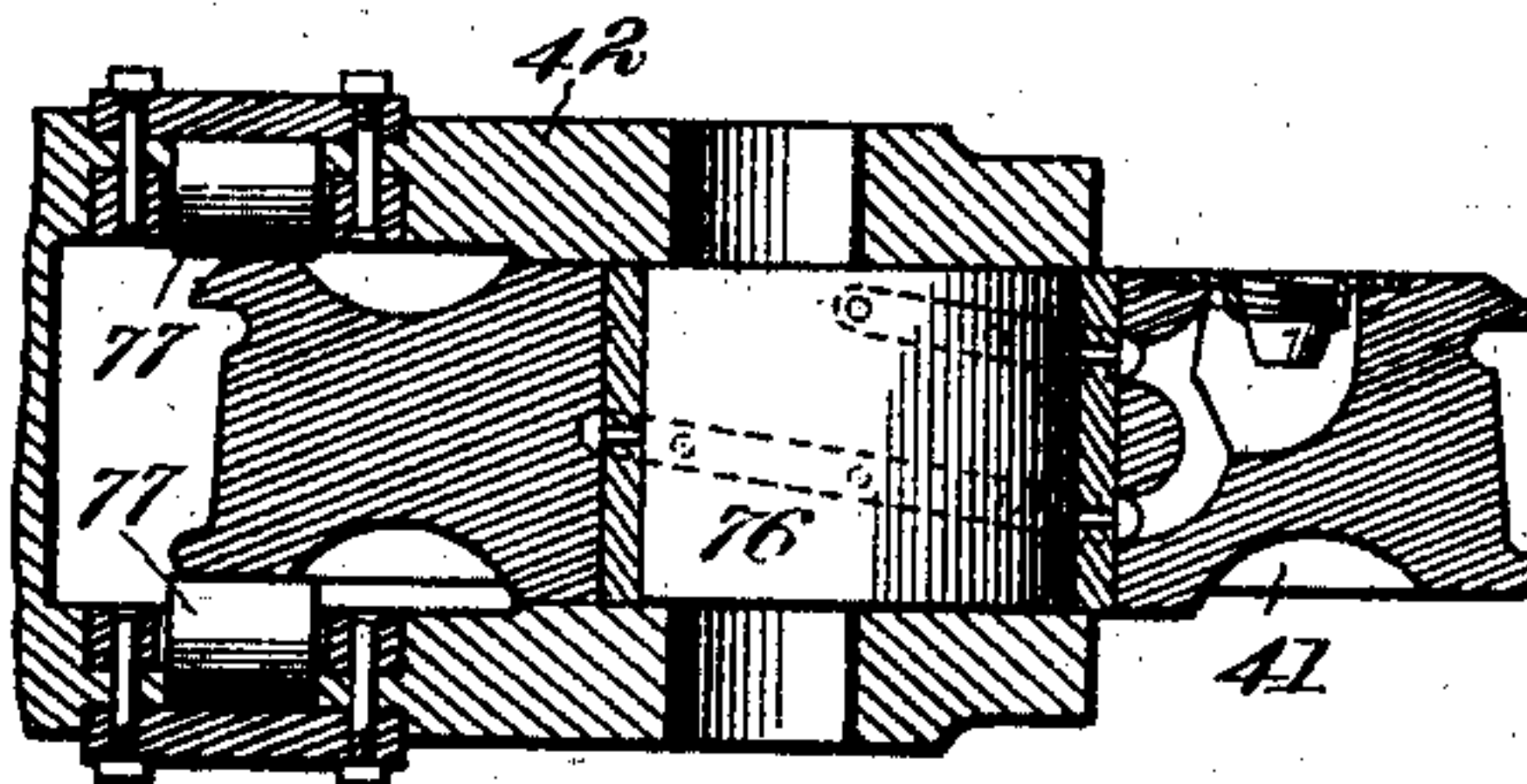
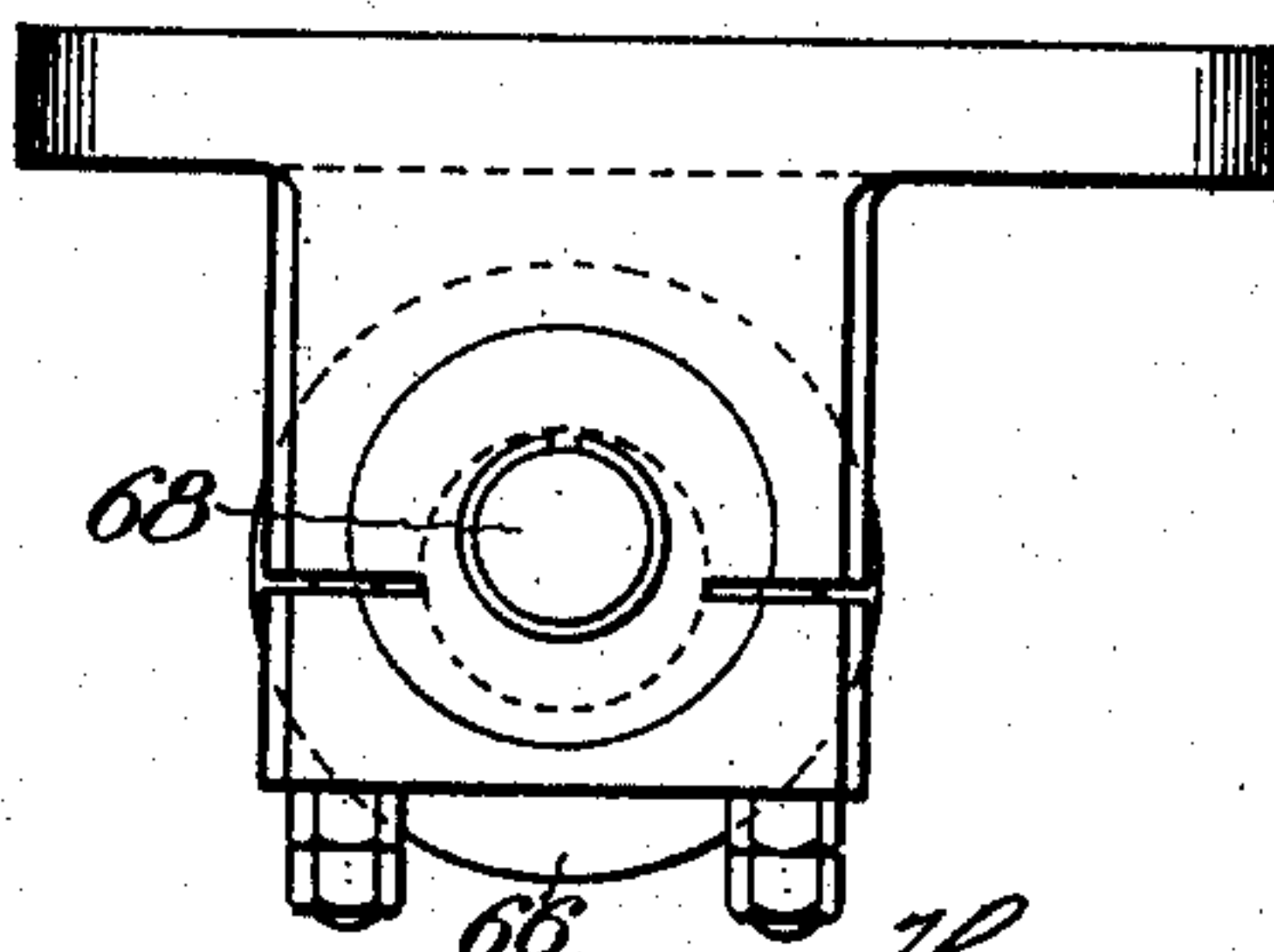


Fig. 6.



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# UNITED STATES PATENT OFFICE.

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## MACHINE FOR ROLLING CAR-WHEELS.

SPECIFICATION forming part of Letters Patent No. 706,674, dated August 12, 1902.

Application filed March 7, 1902. Serial No. 97,198. (No model.)

*To all whom it may concern:*

Be it known that I, HENRIK V. LOSS, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a certain new and useful Improvement in Machines for Rolling Car-Wheels, of which the following is a full, clear, and exact description.

The primary object of this invention is the production of a rolling-mill by means of which a suitably-formed blank of approximately the shape of the finished article may while hot or plastic be reduced to size and shape for final finish.

In the example selected for illustration of the invention the mill is designed for making car-wheels from circular ingots rendered plastic, in which the hub has been nearly or quite finished and then punched, and the web and flanged tread are in embryo. By means of suitable rolls the web is drawn and the flanged tread formed simultaneously or practically at the same time.

In carrying out the invention there is employed a work-supporting carriage, movable upon ways and having a horizontal spindle, upon which the work is supported vertically, and three sets of independently-controllable rolls are used, one set for drawing out the web, another for forming the tread, and another for acting upon the lateral edges of the tread, and these rolls are mounted upon a suitable frame, together with means for controlling them, all as I will proceed now to particularly describe and finally claim.

In the accompanying drawings, illustrating my invention, in the several figures of which like parts are similarly designated, Figure 1 is a partial top plan view and horizontal section taken substantially in the plane of line A B, Fig. 2. Fig. 2 is a side elevation, partly in section, of the forward end of the mill. Fig. 3 is a top plan view of the parts shown in Fig. 2, partly in horizontal section. Fig. 4 is a front end elevation with some of the parts in section. Fig. 5 is a sectional detail, on a larger scale, of one of the edge rolls. Fig. 6 is a top plan view of the edge roll of Fig. 5. Fig. 7 is a horizontal section, on a larger scale, of the tread-roll.

A suitable bed-plate 1 is provided, upon which are erected the stands 2, provided with ways 3, in which is mounted a carriage 4, having a horizontally-arranged spindle 5, upon which the blank 6 is mounted, so as to stand in a vertical plane. This blank is herein shown as a car-wheel, having approximately the shape which will be given to it by the operation of the apparatus, its hub having been punched in order that it may be mounted upon the spindle 5 for treatment in the mill. Any suitable provision may be made for moving the carriage for the work into and out of the mill. Complementary rolls 7 are provided with a profile corresponding to the face and back of the wheel between its hub and the inner portions of its tread, and these rolls are arranged convergently in rotary roll-holders 8, in which they may be secured by gibs or keys 9 or other suitable means. The roll-holders 8 are mounted in bearings 10, which are adapted to turn upon their vertical axes, so that the rolls may be moved toward and from the work, and the said roll-holders have rotary motion imparted to them by means of coupling-rods 11, having a universal-joint connection with the said roll-holders and with shafts 12, mounted in bearings 13 and supplied with beveled gears 14, which in turn mesh with similar gears 15 on a shaft 16, mounted in bearings 17 on the bed-plate. The shaft 16 is positively driven from the engine-shaft 18, mounted in bearings 19, close to the bed-plate and having a driving-gear 20, meshing with an idler 21, which meshes with the gear 22 on shaft 16.

In order to move the rolls 7 toward and from the work, each roll-holder has its forward end mounted in a block 23, which is movable in ways 24 on the bed-plate, and each block 23 is connected by a link 25 with a crank-arm 26 on a vertical shaft 27, and these vertical shafts 27 are provided with arms 28, Figs. 3 and 4, which are connected by links 29 with a cross-head 30, mounted upon a traveling nut 31, engaged by a screw 32, which in turn is mounted in bearings 33 and has at its end a pinion 34, which meshes with a pinion 35 on a short shaft, the other end of which has a pinion 36, which meshes



with a pinion 37 on a shaft carrying the gear-wheel 38, which is driven by a pinion 39 on any suitable motor, such as an electric motor 40, mounted on the frame of the machine.

5 Thus it will be seen that the rolls 7 may be readily caused to approach the work and recede from it by a power appliance without uncoupling them from their driving mechanism and without stopping the machine or cutting off the main power.

10 Substantially in line with the carriage for the work is arranged a tread-shaping roll 41, having its bearings in a carriage 42, mounted in ways 43, and the axis of this roll 41 is in substantially the same horizontal plane as the axis of the work. The roll 41 is adjustable toward and from the work by having its carriage connected with a screw 44, mounted in bearings 45 and having a nut 46, upon which is arranged a worm-wheel 47, which is engaged by a vertical shaft 48, and this shaft 48 in turn has a beveled gear 49, which is engaged by a beveled pinion 50 on a shaft 51, which carries a gear-wheel 52, meshing with a pinion 52<sup>a</sup> on a shaft of an independent motor 53, so that this roll 41 is controllable independently of the pair of rolls 7.

30 The companion roll to roll 41 is designated 54, and the profiles of the rolls 41 and 54 correspond substantially with the flanged tread of the wheel to be produced. The roll 54 is hung in an arm 55, mounted upon a shaft 56, and this shaft has rigidly fixed to it a toothed segment 57, which in turn meshes with a pinion 58 on a shaft 59, which is provided with a gear-wheel 60, which in turn meshes with a gear 61 on a shaft 61<sup>a</sup>, which carries a gear-wheel 61<sup>b</sup>, which meshes with a gear-wheel 62 on a shaft 63, which has a gear-wheel 62<sup>a</sup>, which meshes with a pinion 64 on the shaft of a motor 65, such as an electric motor, so that the roll 54 may be controlled independently of the roll 7 and also controlled independently of its companion roll 41 in order to insert and remove the work. It may prove preferable in order to secure more perfect roundness of the finished wheel, as well as to help the formation of the wheel-flange, to have another idle companion roll similar to roll 54 and similarly fed and located below the wheel-center, just as roll 54 is located above it.

55 In order to limit the lateral flow of the metal in the rim and to form and finish the edges of said rim, there are provided the independent edge rolls or idlers 66. These rolls 66, as shown more in detail in Figs. 5 and 6, are mounted upon bushings 67 upon eccentric shafts 68, arranged obliquely in their bearings, and the shafts 68 are provided with worm-wheels 69, which are engaged by right and left hand worms 70 on a horizontal shaft 71, (shown more in detail in Fig. 3,) and this shaft 71 is connected by gears 72 and 73 with a shaft 74, the latter provided with a hand-wheel 75, by means of which the eccentricity of the rolls 66 may be varied and the width

of the rim of wheel controlled. The worm-shaft 71 admits of the rolls 66 being moved away from the work in order to permit the insertion and removal of the work.

70 As shown in Figs. 1 and 7, the roll 41 is mounted to turn upon a stationary shaft 76, arranged in bearings in the carriage 42. Steadying and centering rolls 77 may also be supplied in the carriage 42 for engaging the rim of the roll 41. Also shown in Fig. 7 is a lubricating device for the hub of the roll 41.

75 Thus it will be seen that the various sets of rolls for rolling the web and for forming the perimeter of the tread and for edging the tread are under ready control, easily adjusted, and all this independently of the main power appliance.

80 As already indicated, the machine is especially designed for the production of a substantially wrought car-wheel having for its blank a cast-steel ingot or other form of casting, the wheel with its hub and flanged tread being integral.

90 I have herein described the use of electric motors for effecting the adjustments of the several rolls, and wish to observe that a platform may be erected adjacent to the hand-wheel 75 upon which the operator may stand, and within convenient reach may be located the switchboard and other apparatus for controlling the operation of the electric motors, and I have deemed it unnecessary to do more than merely mention these points. Of course the electric motors may be replaced by other independent and easily operated and controlled means.

What I claim is—

1. A machine for rolling car-wheels, comprising a carriage having a horizontal spindle upon which the work is supported in a vertical position, a pair of converging rolls adapted to shape the wheel between its hub and rim, rolls adapted to shape the flanged tread of the wheel, and complementary lateral edge rolls, combined with power appliances for driving the converging rolls positively, independent means for moving positively both of said converging rolls into and out of position and for retaining them in position, independent means for moving the tread-rolls into and out of position, and independent means for moving the edge rolls into and out of position.

2. In a rolling-mill, the combination of lateral shaping-rolls, a main edge-shaping roll having its axis of rotation in the plane of the axis of the work, a complementary edge-shaping roll suspended against the work above the horizontal axial plane of the main shaping-roll and the work, a controlling medium for said complementary edge-shaping roll, and a train of gearing interposed between said complementary edge-shaping roll and the controlling medium.

3. In a machine for rolling car-wheels, a work-supporting carriage having a spindle upon which the work is sustained in a verti-



cal plane, a tread-shaping roll, a carriage in which it is mounted, means to adjust said carriage and its roll relatively to the work and controllable independently of the remainder of the machine, a complemental suspended tread-shaping roll and means for controlling it independently, web-shaping rolls, means to drive said web-shaping rolls positively, and independent means for moving the said web-shaping rolls into and out of position.

4. In a rolling-mill, a pair of rolls, roll-holders therefor, supports for said holders, bearings for said rolls, rock-shafts, connections between said bearings and said rock-shafts, a screw, a traveling nut on said screw, and connections between said traveling nut and said rock-shafts, combined with means to rotate the screw and thereby rock the shafts to move the rolls into and out of position.

5. In a rolling-mill, a shaping-roll, a carriage in which it is placed, ways for said car-

riage, a screw applied to said carriage, a nut applied to said screw, a worm-wheel connected with said nut, a worm-shaft meshing with said worm-wheel, an independent motor, and connections between said worm-shaft and independent motor for actuating the carriage.

6. In a rolling-mill, edge rolls, an eccentric shaft for each of them, a worm-wheel on each of said shafts, a shaft having right and left hand worms meshing with the said worm-wheels, and a train of gearing interposed between a hand-wheel shaft and said worm-shaft for adjusting the said rolls relatively to the work.

In testimony whereof I have hereunto set my hand this 25th day of February, A. D. 1902.

HENRIK V. LOSS.

Witnesses:

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