No. 742,556. PATENTED OCT. 27, 1903.

H. R. AULD.

MACHINE FOR SETTING VEHICLE TIRES.

APPLICATION FILED JAN. 21, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 2.

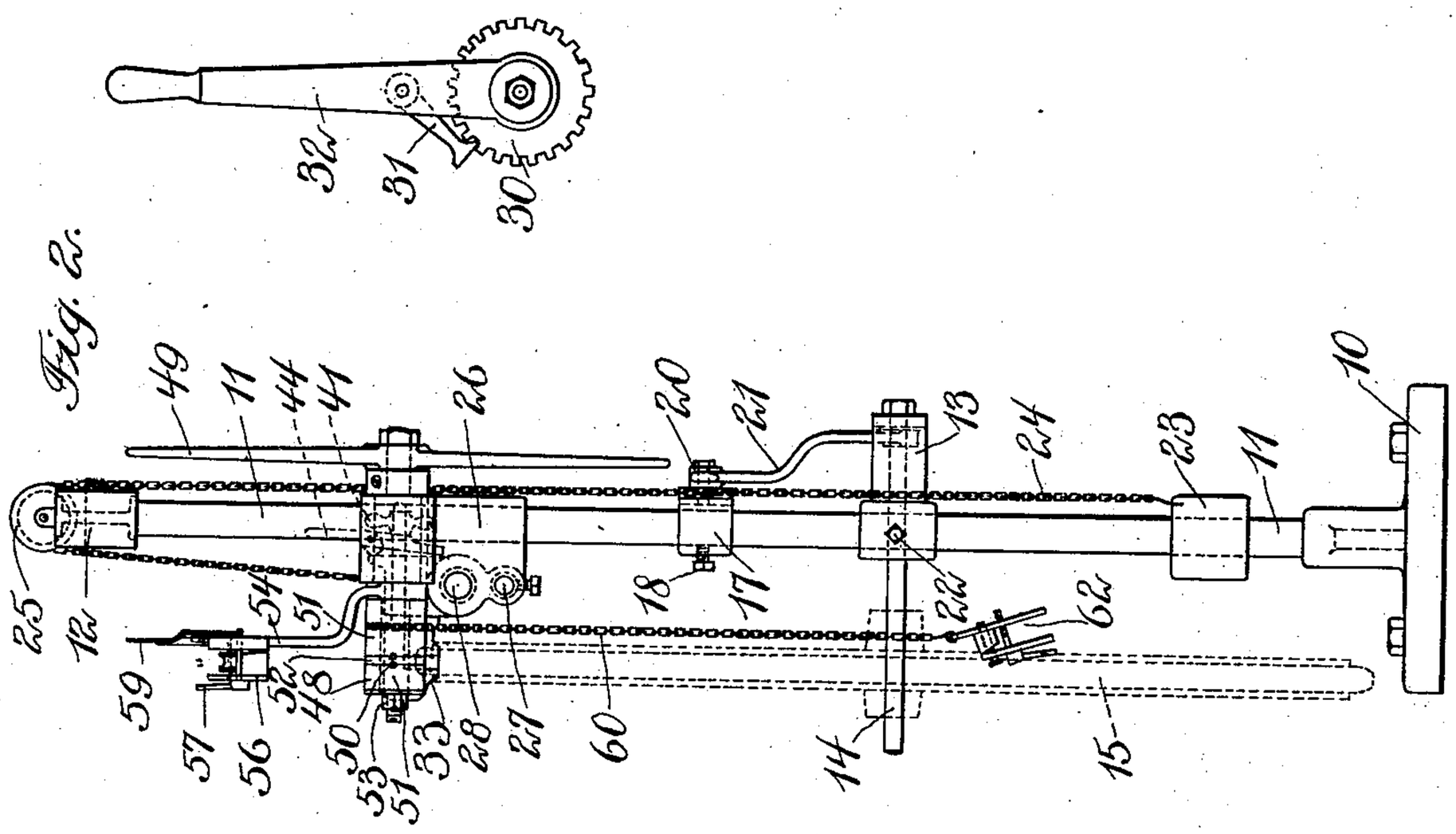
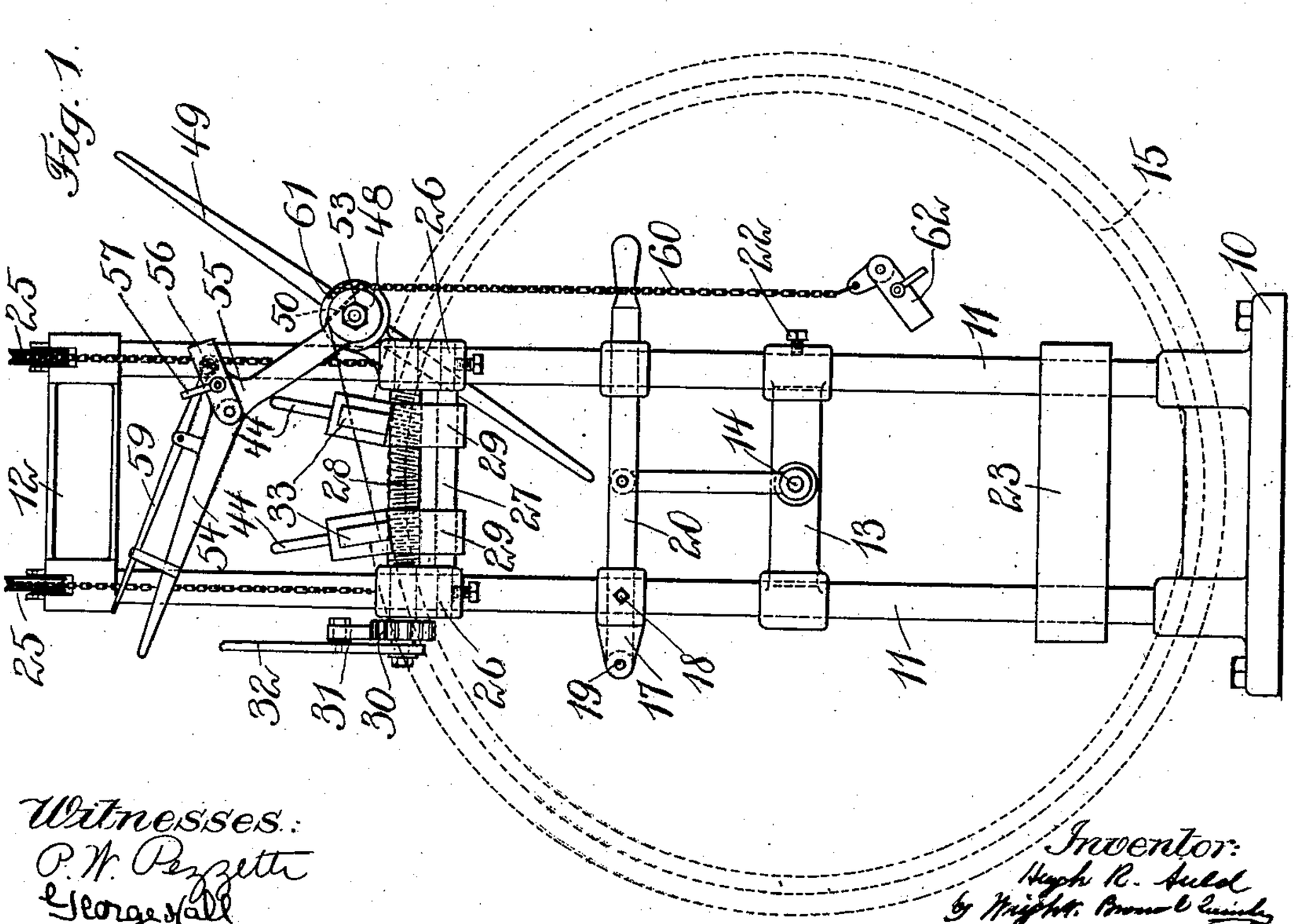


Fig. 1.



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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 3.

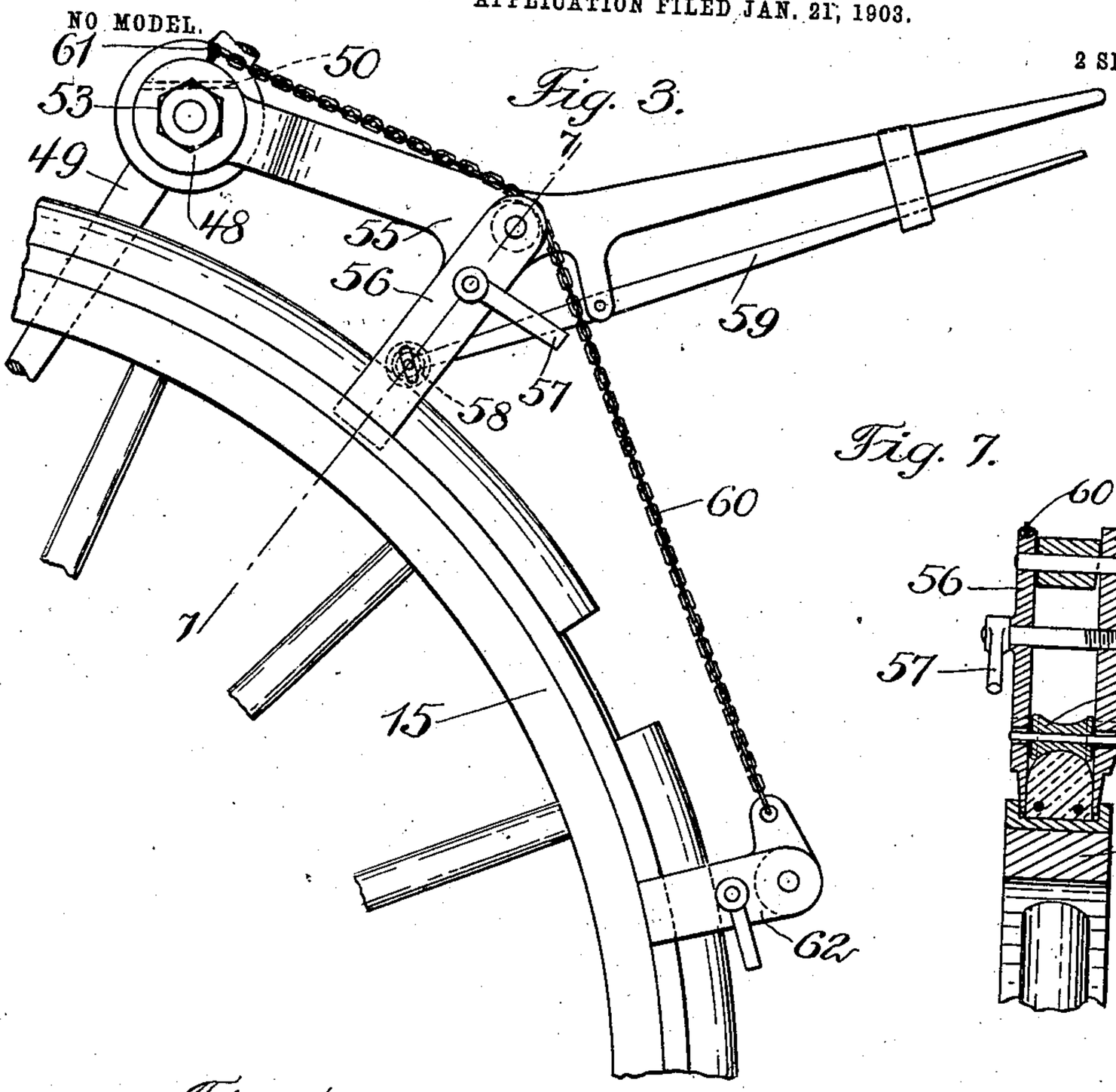


Fig. 7.

Fig. 4.

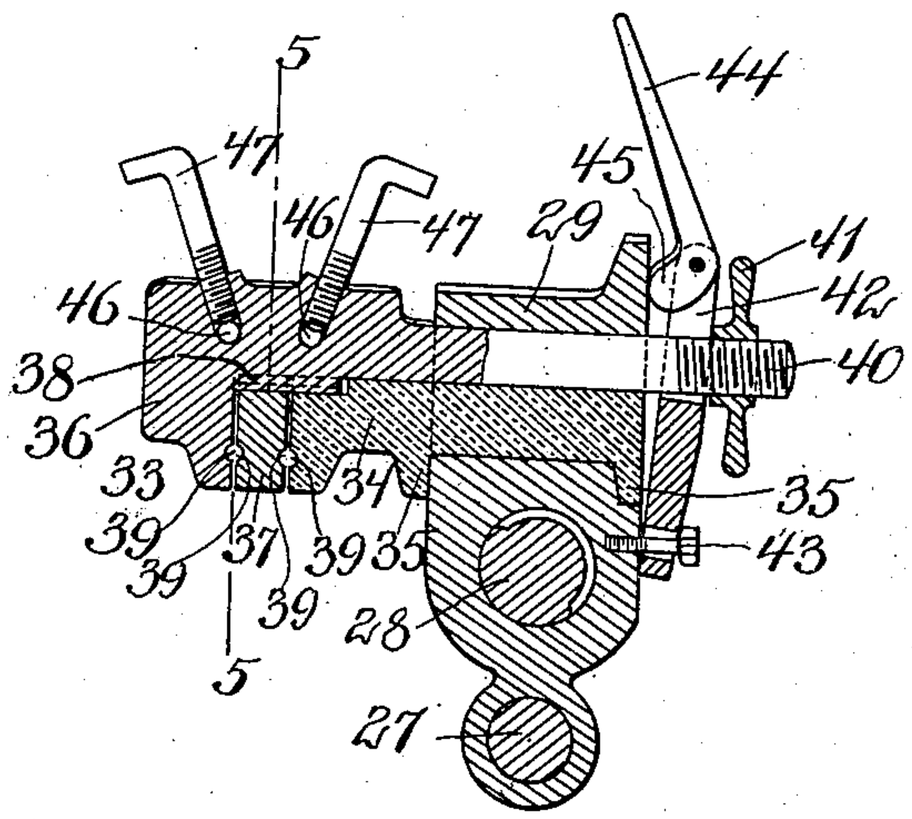
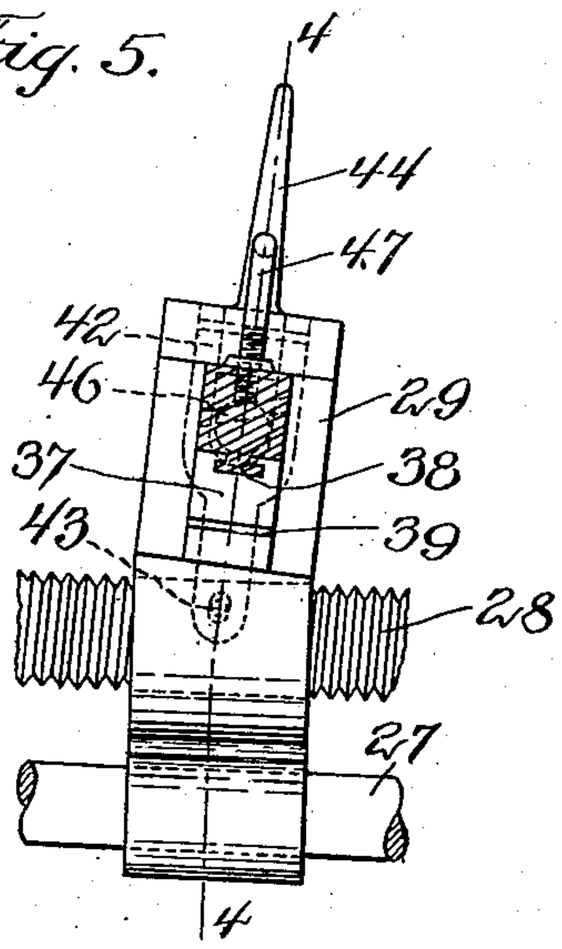


Fig. 5.



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UNITED STATES PATENT OFFICE.

HUGH R. AULD, OF BOSTON, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO JOHN J. McGLINCHY, OF CHELSEA, MASSACHUSETTS.

MACHINE FOR SETTING VEHICLE-TIRES.

SPECIFICATION forming part of Letters Patent No. 742,556, dated October 27, 1903.

Application filed January 21, 1903. Serial No. 139,899. (No model.)

To all whom it may concern:

Be it known that I, HUGH R. AULD, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Machines for Setting Vehicle-Tires, of which the following is a specification.

This invention relates to machines for setting wired rubber tires on vehicle-wheels; and its objects are to reduce the size and complication of such apparatus, to increase the facility of operation, and improve the apparatus in other respects, as will more fully hereinafter appear.

In the form of my invention shown in the accompanying drawings I employ a base provided with two upright guide-rods or standards connected by a yoke at the top and having two slides mounted on it one above the other, the lower slide supporting the wheel, while the upper slide supports the mechanism for operating on the tire. Two clamps of novel construction hold the extremities of the wires while their ends are being brazed, and a wire-winding drum draws the wires to the desired tension previous to being cut. This drum also operates a chain having a clamp to grip the wheel-rim and rotate the latter after the wires have been spliced, whereby the rubber of the tire is "equalized"—that is, its ends being brought together—there being employed for this purpose a swinging arm having clamp members which embrace one extremity of the tire and crowd it toward the other extremity when the wheel is rotated. To mount and operate the wire-gripping clamps, I employ a compound screw rotated by a pawl-lever and ratchet and a clamp-guiding rod parallel to said screw.

Of the accompanying drawings, Figure 1 represents a front elevation of a tire-setting machine constructed in accordance with my invention with the wheel in position. Fig. 2 represents a side elevation thereof. Fig. 3 represents a detail front elevation showing the operation of the parts which "equalize" the tire. Fig. 4 represents a sectional view of one of the wire-gripping clamps. Fig. 5 represents a section on line 5 5 of Fig. 4. Fig. 6 represents a detail side elevation showing the ratchet and pawl for rotating the compound screw. Fig. 7 represents a section on line 7 7 of Fig. 3.

The same reference characters indicate the same parts in all the figures.

In the drawings, 10 is a base in which are secured parallel upright standards or guide-rods 11, connected by a yoke 12 at their upper ends.

13 is a U-shaped slide having long bearing-sleeves at its ends embracing the rods 11. This slide has a horizontal arbor 14 for supporting the vehicle-wheel 15.

17 is a collar adjustably fixed to one of the rods 11 by a set-screw 18 and to which is pivoted at 19 a lever 20, connected by a link 21 with the slide 13, the purpose being to raise and lower the slide 13 and bring wheels of different diameters into proper relation with the mechanism for operating on the tires. A set-screw 22 is provided for fixing the slide 13 on its guides.

Mounted on the guide-rods 11 above the slide 13 is a second slide, composed of bearing blocks or sleeves 26 26, connected by a horizontal guide-rod 27 and journaling a screw 28, having threads of opposite pitch on its respective halves.

29 29 are clamp-supporting blocks having threaded apertures occupied by the threads on the screw 28 and bearing apertures occupied by the guide-rod 27. It will be seen that by a rotation of the screw 28 the blocks 29 will be moved toward and away from each other and guided in their movements by the rod 27. On the end of the screw 28 close to one of the blocks 26 is mounted a ratchet-wheel 30, engaged by a pawl 31, attached to a lever 32, which is loosely pivoted on the end of the screw-rod. This mechanism affords a compact means for rotating the screw without necessitating an extension of the latter beyond the radial limits of the wheel.

In the upper portions of the blocks 29 are mounted wire-gripping clamps, one of which is shown in detail in Fig. 4. Said clamp consists of a removable fixed plate or jaw 34, seated in an aperture in the block 29 and held from longitudinal movement by lugs 35 35 on said jaw, a sliding plate or jaw 36, and an interposed plate 37, mounted to slide on a T-guide 38 on the jaw 36. The members 34 36

37 are grooved at 39 39 to form channels for receiving two wires. It is obvious that this principle of construction may be applied to a clamp for holding a greater or less number of wires or a tire-retaining band. On the threaded rear end 40 of the jaw 36 is an adjusting-nut 41, forming an abutment for a lever 42. The latter is fulcrumed at its lower end on the block 29 and retained by a pin 43, and is provided at its upper end with a pivoted lever 44, having a cam 45 for bearing on the block 29, thereby oscillating the lever 42 and drawing back the jaw 36 to clamp the wires or permitting the clamp to loosen.

In the jaw 36 of the right-hand clamp 33 as viewed in Fig. 1 are channels or holes 46 46 for the passage of one end of the wires to the preliminary tightening device, and clamp-screws 47 47 are provided for holding in check either or both wires which pass through said channels.

48 is a drum journaled on the right-hand block 26 as viewed in Fig. 1 and rotated by a double-spoked hand-lever 49, said drum having wire-channels 50 50 located closer together than the usual distance between the wires of a tire and formed in two end blocks 51 51, and an intermediate plate or block 52, all of which may be drawn together by a nut 53 to clamp the wires to the drum.

On the arbor of the drum 48 is pivoted a lever 54 55, having clamp-arms 56 adapted to embrace the sides of the rubber tire and drawn together by a screw-lever 57. There is also a roller 58, mounted on a secondary lever 59, pivoted to the lever 54 for pressing on the periphery of the tire.

60 is a chain removably attached to the inner part of drum 48 by a pin 61 entering a hole in said drum and having at its opposite end an adjustable clamp 62 for gripping the rim of the wheel 15.

To counterbalance the weight of the slide 26 27 and attached parts, there is provided a weight 23, mounted to slide on the lower part of the guide-rods 11 and connected with the blocks 26 by chains 24 24, passing over pulleys 25 25, surmounting the yoke 12.

As above described, the slide 13 of the wheel-supporting means is readily adjusted by means of the lever 20, and the said lever is pivoted to the collar 17, which is adjustably fixed to one of the rods 11 of the frame or standard. It will therefore be readily understood that the entire wheel-supporting means may be moved to any position on the frame within the limits prescribed by the bottom of the frame or the counterweight 23 and the position of the head including the upper slide 26 27, and of course the upper slide may be adjusted to any position on said frame or standard between the limits prescribed by the upper ends of the frame and the position of the lower slide.

The wheel-supporting slide and the head-slide may either of them be moved on the frame or standard to a position previously occupied by the other. For instance, if a wheel considerably smaller than that indicated by dotted lines in Fig. 1 is to be operated upon, the lower slide may be moved so far down that the upper slide will when brought to operative position be moved to a position below that occupied by the lower slide or the collar 17 in said figure. On the other hand, if a much larger wheel is to be operated upon, the lower slide may be raised so far that the collar 17 will be moved to or beyond the position occupied by the upper slide in said Fig. 1. This construction provides for a very simple and easy adjustment that enables the machine to be employed for operating upon wheels of all possible sizes or dimensions for different kinds of vehicles.

The operation is as follows: For vehicle-wheels of small and intermediate sizes the slide 26 27 is set at about the relative height seen in the drawings, so that a man standing on the floor on which the base 10 is set may conveniently reach the top of the wheel and the parts carried by said slide. The wheel is placed on the arbor 14 and the upper edge of its felly brought close underneath the clamps 33 by using the lever 20 to raise or lower the slide 13. It will be noted that the U shape of said slide admits long wheel-hubs and also permits the wheel body and rim to be brought close to the standard 11 even when the wheel-hub is long. This is one feature which enables me to employ a comparatively light and narrow guiding structure 11. Furthermore, since the wheel-rim is brought close to the vertical standards the wire-holding jaws are made comparatively short and are therefore stronger than in machines which support the wheel-rim at some considerable distance from the jaw-carrier. When very large wheels, such as hansom-wheels, are being operated on, the slide 26 27 is raised, and the operator then stands on a support, such as a box, alongside of the machine; but by allowing the slide 26 27 and related parts to be raised and lowered I do not need to maintain the same at an excessive height for all wheels. When the wheel is in position, with the tire loose and its wires unjoined, one end of each wire is fixed in the right-hand clamp 33, said clamps being separated a considerable distance. The other ends of the wires are passed through the loosened left-hand clamp 33, through the holes 46 in the right-hand clamp, and are secured in the grooves 50 of the drum 48. The latter is then rotated by means of handle 49 and the wires wound up on the portions 51 of said drum. The tire is thus drawn up tight to the rim of the wheel, and the rubber is stripped or compressed back on the wires by abutting against the clamps 33. If there is an uneven tension on the wires, the tighter one is held by one of the check-screws 47 and released from the drum 48, and the looser wire is then tightened singly by means of said drum. After the tire is tightened the wires are gripped by setting up the left-hand clamp

33, and the ends are cut to the desired length and joined or spliced in the usual manner. After joining the ends of the wires the next operation is to equalize the tire by bringing the ends of the rubber together, and this is accomplished by means of the chain 60 and lever 54. The latter is swung down into its operative position, as shown in Fig. 3, and the jaws 55 56 caused to embrace the sides of the rubber with considerable friction, but not tightly enough to prevent the tire from slipping through said jaws. The clamp 62 is secured to the felly of the wheel and the handle 49 rotated, so as to wind up the chain 60 on the drum 48 and draw the clamp 62 and the portion of the wheel-rim to which it is fixed toward the jaws 55 56. Said jaws and the roll 58 press and crowd the end portion of the tire with which they are engaged toward the other end until the ends meet, whereupon the operation of the machine upon the tire is complete. By suitably forming or constructing the clamp members 55 56 or similar members on the lever 54 the operation of scraping the tire-channel may be performed with the lever 54.

It is understood that various modifications in construction may be made without departing from the spirit of my invention.

I claim—

1. In a machine for setting rubber tires, the combination of a frame or standard, wheel-supporting means and a head adjustably mounted on said frame or standard and each capable of being moved to and beyond a position previously occupied by the other on said frame or standard, and means on said head for gripping the tire-securing wire or strap.

2. In a machine for setting rubber tires, the combination of wheel-supporting means, and a device for gripping a plurality of tire-securing wires or strips of a wheel mounted on said means, the same comprising a jaw-supporting block, fixed and sliding jaws mounted in said block, an intermediate plate between said jaws, a nut on the sliding jaw, a fulcrumed lever coöperating with said nut, and a cam-lever for oscillating said fulcrumed lever.

3. In a machine for setting rubber tires, the combination of wheel-supporting means, a pair of wire or strip gripping devices each comprising relatively movable jaws, one of the jaws of one of said devices having a portion extending across the opening between the jaws and formed with channels to receive the wires from the other device, manually-movable screws for clamping the wires in said channels, and means for tightening the wires.

4. In a machine for setting rubber tires, the combination of wheel-supporting means, wire or strip gripping devices, a wire-winding drum, a flexible band-like device winding on said drum, a tire-crowding device, and means for gripping the wheel to rotate it by said device.

5. In a machine for setting rubber tires, the combination of wheel-supporting means, wire or strip gripping devices, a wire-winding drum, and a member mounted to swing on the arbor of said drum and having tire-crowding means.

6. In a machine for setting rubber tires, the combination of wheel-supporting means, wire or strip gripping devices, wire-winding means, wheel-rotating means operated by said wire-winding means, and a tire-crowding device.

7. In a machine for setting rubber tires, the combination of wheel-supporting means, wheel-rotating means, and a stationarily-mounted tire-crowding device, said wheel-rotating means including a felly-clamp, a drum mounted behind the tire-crowding device, and a flexible connection between said clamp and said drum.

8. In a machine for setting rubber tires, the combination of wheel-supporting means, wheel-rotating means, and a member pivoted to swing into operative and inoperative positions and having tire-crowding means, said wheel-rotating means including a felly-clamp, a drum mounted behind the tire-crowding device, and a flexible connection between said clamp and drum.

In testimony whereof I have affixed my signature in presence of two witnesses.

HUGH R. AULD.

Witnesses:
R. M. PIERSON,
A. C. RATIGAN.