

D. R. EVANS.
TIRE SETTING MACHINE.
APPLICATION FILED FEB. 7, 1908.

936,435.

Patented Oct. 12, 1909.

2 SHEETS—SHEET 1.

Fig. 1.

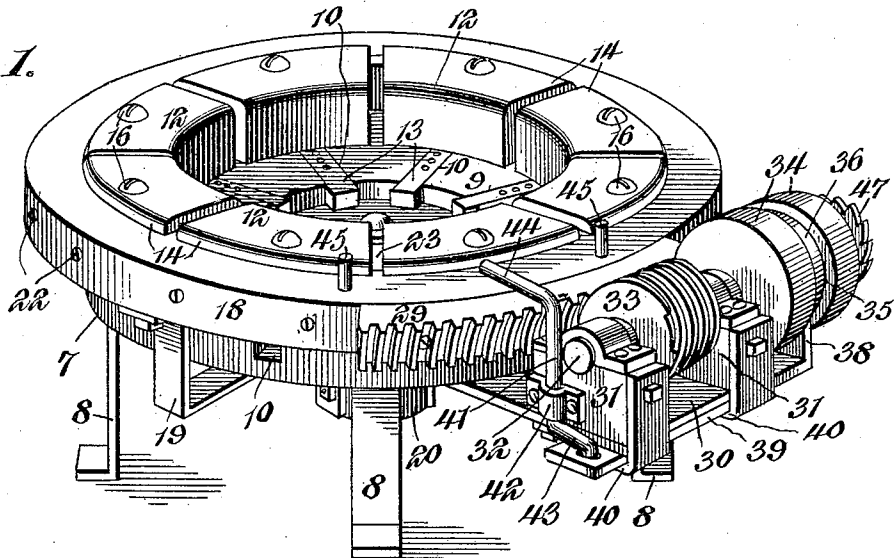


Fig. 5.

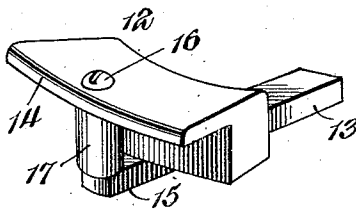


Fig. 6.

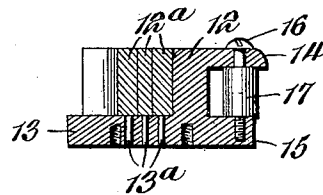
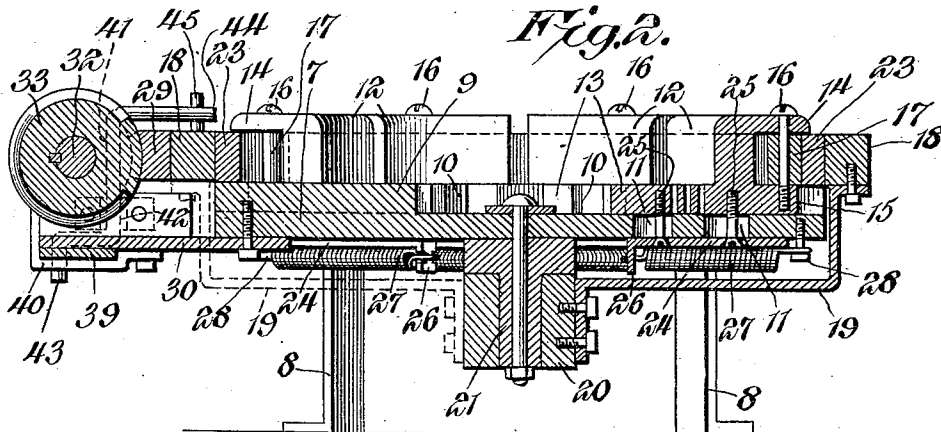


Fig. 2.



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Witnesses

Howard D. Carr.

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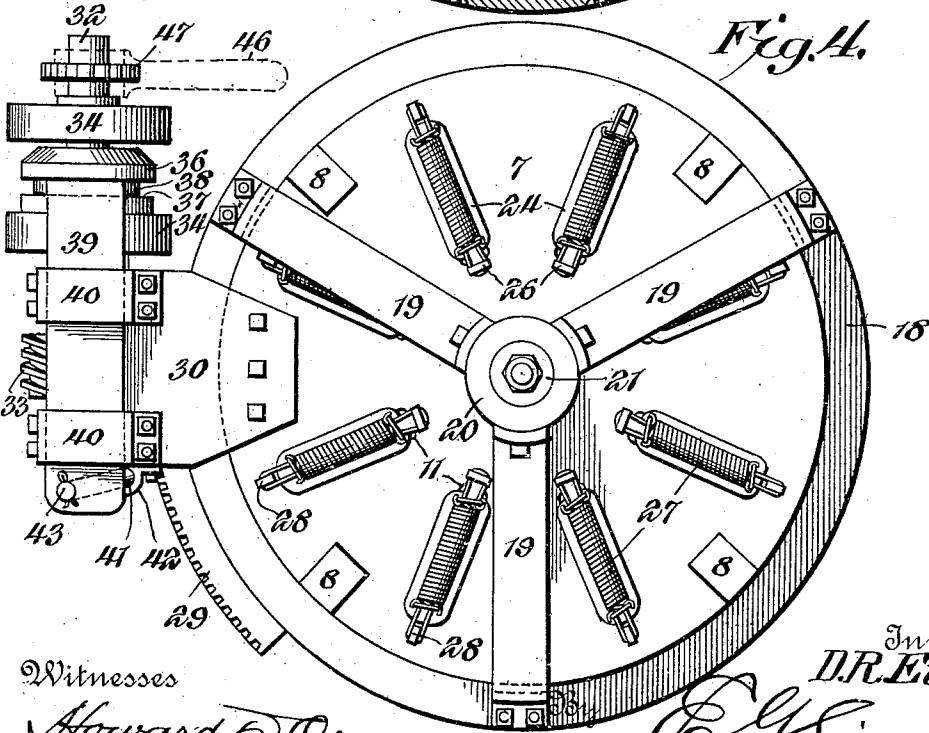
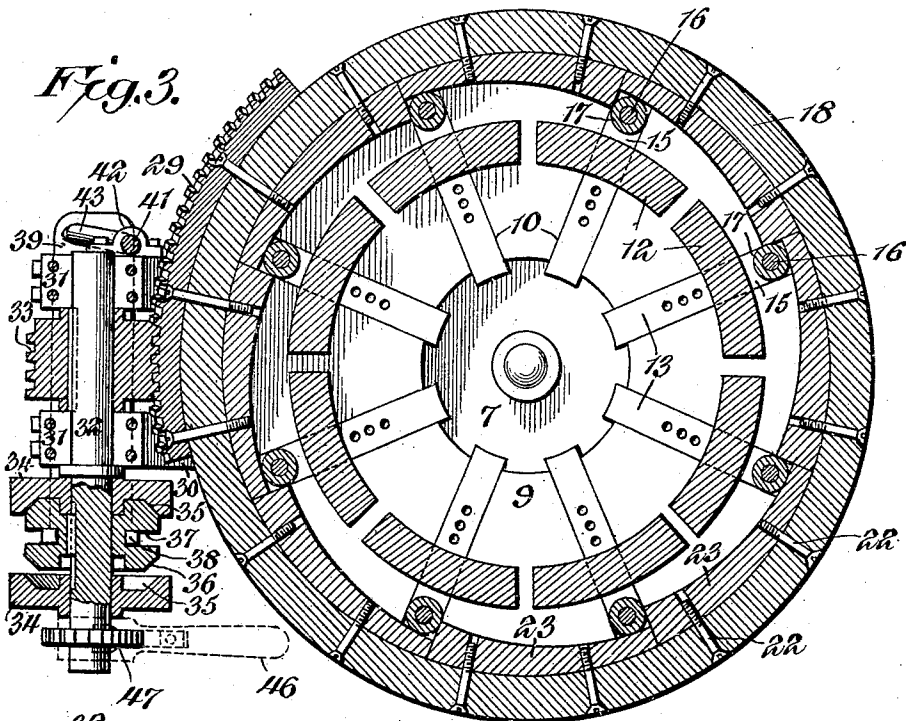
Attorney

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2 SHEETS—SHEET 2.



Witnesses
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UNITED STATES PATENT OFFICE.

DAVID R. EVANS, OF FLORENCE, ALABAMA.

TIRE-SETTING MACHINE.

936,435.

Specification of Letters Patent.

Patented Oct. 12, 1909.

Application filed February 7, 1908. Serial No. 414,737.

To all whom it may concern:

Be it known that I, DAVID R. EVANS, a citizen of the United States, residing at Florence, in the county of Lauderdale and State of Alabama, have invented a new and useful Tire-Setting Machine, of which the following is a specification.

The principal object of the present invention is to provide effective mechanism of a novel nature for setting tires on wheels or for other analogous purposes, said mechanism being intended to take the place of hydraulic means now commonly employed, which means while powerful, has certain defects and objections, the principal of which is its comparatively great cost, the constant attention needed by the pumps, the necessity of continuous renewals of packing, and the amount of oil used.

In the accompanying drawings:—Figure 1 is a perspective view of the preferred embodiment of the present invention. Fig. 2 is a vertical sectional view therethrough. Fig. 3 is a horizontal sectional view. Fig. 4 is a bottom plan view. Fig. 5 is a detail perspective view of one of the jaws. Fig. 6 is a detail sectional view through a jaw, showing additional jaw sections applied thereto.

Similar reference numerals designate corresponding parts in all the figures of the drawings.

In the embodiment illustrated, a circular table 7 is employed, supported on suitable standards or legs 8, and provided with a circular upstanding portion 9 that is subdivided by radial slots 10, openings 11 being formed through the table and communicating with said slots. A plurality of radially movable cooperating setting jaws 12 are slidably mounted on the table top, and have horizontal stems 13 that reciprocate in the radial slots 10, said stems thus constituting guides for the jaws. The jaws furthermore are provided on their outer sides with flanges 14 and ears 15, located beneath said flanges. Screws 16, connecting the flanges and ears, constitute journal bearings for rollers 17 located therebetween, said rollers thus being mounted on the jaws and movable therewith. A compressing member, in the form of a rotatable ring 18, surrounds the jaws, and has a plurality of arms 19, which extend beneath the table top, and are secured to a collar 20 journaled upon a hub 21 that depends from the center of the table. Secured to the inner side of the ring 18, by

screws 22 or other suitable fasteners, are cam elements, in the form of wedge blocks 23 arranged end to end, as will be seen by reference to Fig. 3. These cam blocks have their inner faces operating against the rollers 17, and one block is provided for each jaw. The said jaws are held in position by retaining plates 24 located beneath the table top and secured to the stems 13 by fasteners 25 that pass through the openings 11. These retaining plates have downturned inner ends 26 constituting ears to which are connected the inner ends of coiled springs 27. The outer ends of the springs are secured to suitable stub bolts 28 fastened to the table top. The springs therefore serve to urge the jaws outwardly and maintain the rollers 17 in engagement with the cam elements or blocks 23. It will thus be evident that if the ring 18 is turned in one direction, the rollers 17 will be forced inwardly, thus carrying the jaws in a corresponding direction, so as to set a tire upon a wheel placed within said jaws. On the other hand, if the ring is turned in the other direction, the springs will move the jaws outwardly. The present structure is particularly intended for heavy work. For lighter grades of work, the cam blocks may be differently arranged.

The rotation of the ring is effected by the following mechanism. A worm gear or rack 29 is fastened to the periphery of the ring, and a bracket 30, secured to the table top and projecting beyond one side thereof, has journal boxes 31 in which is rotatably mounted a shaft 32, this shaft being provided with a worm 33 that is in mesh with the rack 29. The shaft may be rotated by any suitable means. Thus in the present embodiment, two drive pulleys 34 are shown, which are rotatable on the shaft and are intended to be rotated in opposite directions by suitable belts, one of which is crossed. These pulleys are suitably held against endwise movement on the shaft. These pulleys are spaced apart, and have their opposing faces formed with clutch sockets 35. A clutch element 36, feathered upon the shaft, is movable into and out of each clutch socket 35, and is provided with an annular groove 37 in which is engaged the fork 38 of a slide 39. Said slide is supported on the bracket 30 in guideways 40 and projects beyond one side of said bracket. A rock shaft 41, journaled, as shown at 42, on one of the boxes 31, is pro-

vided with a lower crank arm 43 engaged with the slide 39. This rock shaft also has a handle crank 44 at its upper end, which extends over the compressing ring 18. The crank is adapted to be operated by hand, but pins 45 may also be mounted on the compressing ring for the purpose of swinging said arm and thereby actuating the slide to move the clutch element 36. In order that the apparatus may be used in repair shops where there is no power mechanism, a lever indicated in dotted lines at 46, may be mounted on one end of the shaft, and have a ratchet connection 47 with said shaft.

The operation of the mechanism is substantially as follows. Assuming the parts in the position shown in Figs. 1 and 3, the wheel on which the tire is to be set, and said tire, are placed within the jaws, and the handle crank 44 is moved to clutch the appropriate pulley to the shaft. Thereupon said shaft will be rotated, which through the medium of the worm gearing, will cause the rotation of the ring 18. As a result, the jaws will be moved inwardly. When the compression action has taken place, the pin 45 will strike the handle crank 44, thus causing the clutch element to be moved out of coaction with the pulley so that the machine will be stopped. If now the handle crank 44 is again moved to clutch the other pulley, it will be evident the rack 18 will be rotated in an opposite direction, thus permitting the jaws to separate until the other pin strikes the handle and again stops the apparatus. In case different sizes are to be operated upon, additional jaw sections 12^a are employed, which have pins 13^a that detachably engage in sockets formed in the stems 13, all of which will be clear by reference to Fig. 6.

From the foregoing, it is thought that the construction, operation and many advantages of the herein described invention will be apparent to those skilled in the art, without further description, and it will be understood that various changes in the size, shape, proportion and minor details of construction, may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

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

1. In a machine of the character described, the combination with a supporting table having radial slots in its upper face, of a plurality of radially movable compressing jaws mounted thereon having inwardly extending portions sliding in said slots, a rotatable compressing ring mounted on the table and surrounding said jaws, the inner face of the ring being provided with a series of inwardly projecting cams, one for each jaw, and operating against the same, springs

for retracting the jaws against their inward movement by the cams, and gearing mounted on the base of the machine engaging with the compressing ring to rotate the same.

2. In a machine of the character described, the combination with a stationary table having downwardly extending supports and provided with a series of radial slots on its upper face and radial openings alining with the slots and extending through to its lower face, of a series of compressing jaws mounted on the upper face of the table, each having inwardly extending guide portions received in one of said slots, a rotatable compressing ring mounted upon the table and having a series of compressing cams upon its inner face, each cam adapted to engage with one of the jaws to force it inwardly upon a rotation of the compressing ring, pins projecting from the lower sides of the jaws and extending through the slots in the table, retracting springs attached to the under side of the table and having their inner ends connected to said pins, gearing for rotating the compressing ring, and means for automatically stopping the rotation of the compressing ring at the limit of its movements in either direction.

3. In a machine of the character described, the combination with a stationary table having an annular elevated portion formed with radial slots, the table being provided with radial openings through it, alining with said slots, a compressing ring rotatably mounted on the table and having a series of cams formed on its inner face, a series of radially movable jaws mounted inwardly of the ring and having projecting guide portions which slide in the slots formed in the annular elevated portion of the table, pins on said guide portion extending down through the slots in the table, a retaining plate for each of said jaws located beneath the table and connected to the pins projecting from said jaw guide, springs attached to the table at their outer ends and connected at their inner to the said plates, and mechanism for rotating the compressing ring in one direction and for reversing this movement.

4. In a machine of the character described, the combination with a stationary table having an annular upstanding portion formed with radial slots, of a rotatable compressing ring mounted above but projecting inward over the circumferential margin of the table, said compressing ring having a series of cams upon its inside face, of a series of compressing jaws, each formed with outwardly projecting upper and lower flanges carrying a roller journaled between them and with an inwardly projecting guide portion adapted to be received and move in said slots, pins projecting from the jaws through the openings in the table, retracting springs connected at one end to said pins and at the

other to the outer edge of the table, and mechanism for rotating the outer ring to force the jaws inwardly.

5. In a machine of the class described, the combination with a stationary table having radial guide slots therein, of compressing jaws slidably mounted on the table having inwardly projecting guide portions engaged in said slots, a compressing ring surrounding the jaws having cams upon its inner face adapted to force the jaws inwardly, and a series of supplementary jaws having downwardly extending pins adapted to be engaged with the inwardly extending guide portions of the permanent jaws.

6. In a machine of the character described, the combination with a support, of a rotatable compressing ring mounted on the same, compressing jaws slidable on the support, each having a flange which overlaps the ring, a roller journaled on each of the flanges, and means carried by the compressing ring for acting against the rollers to force the compressing jaws inwardly.

7. In a machine of the character outlined, the combination with a stationary table having a central depending hub, of supporting legs for the table, compressing jaws radially movable on the table, a rotary ring journaled on the table and operating against the jaws, and having a series of cams mounted upon its inner face, a collar rotatably mounted on the hub, arms fixed to the collar and to the ring outside of the table, and means for rotating said ring.

8. In a machine of the character outlined, the combination with a plurality of compressing jaws, of a rotary compressing member for operating the same, a worm gear located on the member, a shaft, a worm oper-

ated by the shaft and meshing with the worm gear, oppositely rotating driving members loosely mounted on the shaft, an oppositely movable clutch element for connecting either driving member to the shaft, and means operated by the compressing member at the limit of its movement in one direction for automatically throwing the clutch element out of coaction with one of the driving members but not into engagement with the other of said members.

9. In a machine of the character described, the combination with a plurality of compressing jaws, of a rotary compressing member for operating the same, a worm gear located on the member, a shaft, a worm operated by the shaft and meshing with the worm gear, oppositely rotating driving members loosely mounted on the shaft, an oppositely moving clutch element for connecting either driving member to the shaft, a slide connected with the clutch element, a handle crank having a connection with the slide, moving the same in opposite directions and extending over the rotary compressing member, and pins upwardly projecting from the compressing member adapted upon engagement with the handle crank to throw the movable clutch element out of connection with one of the driving gears but not into connection with the other of said driving members to stop the movement of the compressing member.

In testimony, that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

DAVID R. EVANS.

Witnesses:

J. J. BARTON,
J. W. ROMINE.