

H. M. & H. S. LOURIE.
HYDRAULIC EDGE GRIP TIRE SETTER.
APPLICATION FILED APR. 18, 1911.

1,043,613.

Patented Nov. 5, 1912.

2 SHEETS—SHEET 1.

Fig. 1.

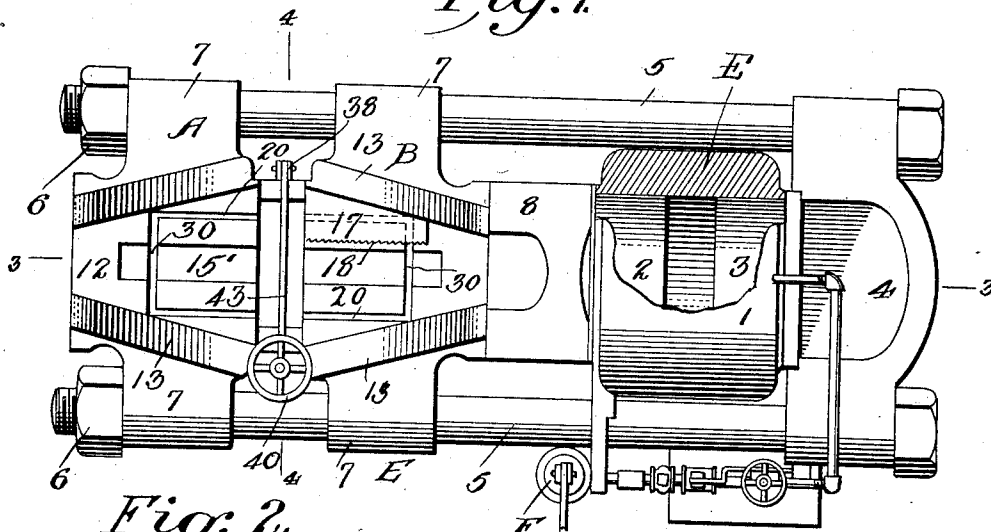


Fig. 2.

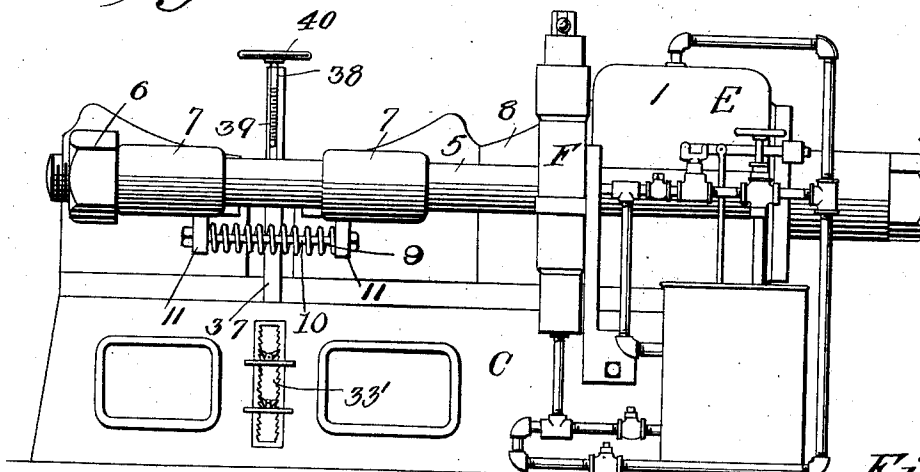


Fig. 5.

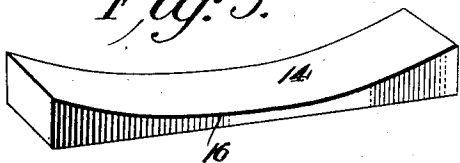


Fig. 6.

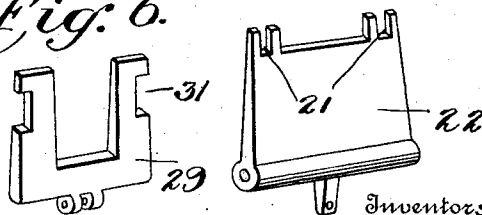
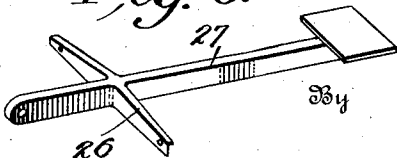


Fig. 8.



Witnesses
Jo Hallin
J. M. Vankof

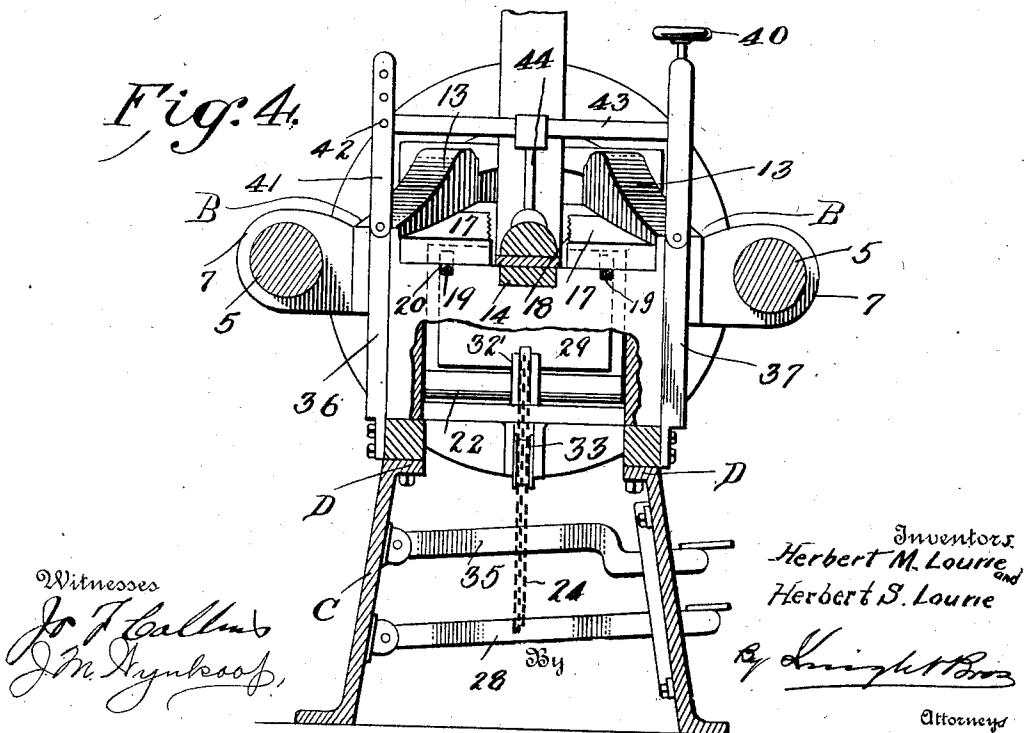
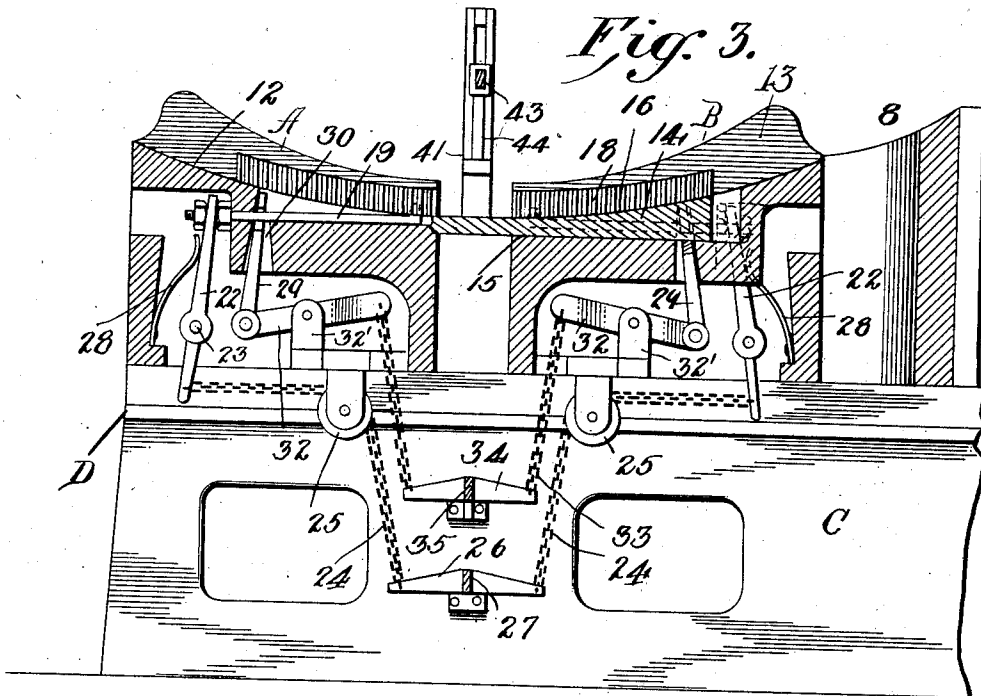
Inventors
Herbert M. Lourie and
Herbert S. Lourie,
Knights Bros.
Attorneys.

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2 SHEETS—SHEET 2.



UNITED STATES PATENT OFFICE.

HERBERT M. LOURIE AND HERBERT S. LOURIE, OF SPRINGFIELD, ILLINOIS.

HYDRAULIC EDGE-GRIP TIRE-SETTER.

1,043,613.

Specification of Letters Patent.

Patented Nov. 5, 1912.

Application filed April 18, 1911. Serial No. 621,954.

To all whom it may concern:

Be it known that we, HERBERT M. LOURIE and HERBERT S. LOURIE, citizens of the United States, and residents of Springfield, in the county of Sangamon and State of Illinois, have invented certain new and useful Improvements in Hydraulic Edge-Grip Tire-Setters, of which the following is a specification.

This invention relates to an improvement in tire setting machines, and more particularly to that type of machines known as edge grip setters.

One of the objects of the present invention is to provide a machine of this character wherein hydraulic actuated means may be employed to operate the mechanism which controls the setting of the tire. To this end we have provided a pair of oppositely disposed head blocks operatively controlled by the respective pistons of a hydraulic press.

A further object of the present invention resides in the novel arrangement of means for symmetrically adjusting the respective gripping jaws which are confined on the head blocks both in a longitudinal and vertical plane.

Further objects and advantages of the present invention will appear from the following description with reference to the accompanying drawings, wherein:—

Figure 1 is a top plan view of our improved machine, the cylinder of the hydraulic press being broken away to more clearly show the relative arrangement of the pistons and the respective head blocks; Fig. 2 is a side elevation of the same; Fig. 3 is a vertical sectional view taken on the line 3—3 of Fig. 1, the supporting frame of the machine, together with several of the details thereof, being shown in elevation; Fig. 4 is a transverse vertical section taken on the line 4—4 of Fig. 1; Fig. 5 is a detail perspective view of one form of the wheel supporting member which bridges the space between the oppositely disposed head blocks, and Figs. 6, 7 and 8 disclose in perspective views certain details more fully described hereinafter.

Referring to the drawings wherein like reference characters indicate like parts throughout the different views, the letters A and B designate the oppositely disposed head blocks which are slidably mounted upon a suitable frame C, provided with longitudinal sills D. This frame extends throughout the length of the machine and

supports at one end thereof the hydraulic press E.

The hydraulic press used in connection with and forming a part of the machine embodied in the present invention comprises a cylinder 1, wherein a pair of oppositely disposed pistons 2 and 3 are positioned, the movement thereof being controlled by the admission of a hydraulic pressure medium therebetween, thus causing the pistons to move, when under pressure, in opposite directions. Any suitable form of pump F or other device may be employed for forcing the pressure medium into the cylinder of the press, and suitable arrangements of inlet and exhaust valves may be made to suit conditions.

As will be seen in the drawings, and more particularly in Fig. 1, the piston 3 is formed integral with a cross head 4 which projects transversely beyond the sides of the cylinder 1 and is connected on each side with the longitudinal rods or bars 5, these bars being provided with screw threaded extremities whereon the nuts 6 or other fastening means may be secured so that the head block A, which is mounted on the opposite end of these rods may be held at a variable distance from the cross head 4. The head block A is provided with lugs 7 in which the tension rods 5 are fitted. Block B is preferably, though not necessarily, provided with lugs 7^b in which the rods 5 have sliding bearing.

In order that the head block B may be caused to move in an opposed direction to that of the movement of the head block A, suitable means may be interposed between the piston 2 of the hydraulic press and the rear face of the head block B. In the present instance, we have shown one form of such means comprising a bearing or push block 8, one end of which abuts against the outer face of the piston 2, while the opposite end thereof engages with the rear end of the head block B.

From the above, it will be obvious that when hydraulic pressure is introduced into the cylinder 1, the pistons 2 and 3 will be driven or moved in opposite directions and in consequence of the connection between the head blocks and the respective pistons, movement will be transmitted to the said blocks in the same direction as that of the respective pistons. Inasmuch as the gripping jaws have been previously adjusted to

securely engage the edges of the tire, the movement of the head blocks A and B, which carry the said gripping jaws in the direction of upsetting will cause the tire to be shortened or upset and thus to be securely fastened to the felly of the wheel. As soon as the hydraulic pressure is permitted to exhaust from the cylinder of the press, the spring 9, which has been put in compression by the movement of the head blocks A and B, and which is mounted between said head blocks upon the rod 10, slidably journaled in depending ears 11 integrally formed on each of the respective head blocks, will force said head blocks apart into their normal position.

The head blocks A and B are preferably formed of steel castings and are of substantially shell construction, the bottom thereof being open to permit the ready assembling of the elements which comprise the adjusting means whereby the preliminary gripping action of the gripping jaws is effected, as well as the vertical adjustment of said jaws, so that a maximum gripping surface may be present to the edge of tires of varying diameter. The top or supporting surface 12 of each head block is preferably concaved so as to present a curved surface whereon the tire of the wheel is adapted to rest.

Each of the blocks A and B is provided with upwardly extending side walls 13 and 13^b which converge toward one end and thereby present beveled, opposed, vertical surfaces as is clearly shown in Fig. 4; the said side walls gradually increasing in height toward their converging ends for a purpose more clearly set forth hereinafter.

Inasmuch as machines of this character are used in the treatment of wheels and tires of different diameters, it has been found essential to have some means for supporting the section of the tire adjacent to the place which is to be shortened or upset and to also support that portion of the wheel which bridges the head blocks so that the tire will be upset without kinking and will be in a true circle when the work is done. One of the features of the present invention consists in the employment of a supporting bar or member 14 which rests in elongated slots or grooves 15 15' formed in the upper faces of the head blocks A and B, these grooves forming a single continuous depression when the two head blocks are in operative position. As will be seen in Figs. 1 and 3, the length of the supporting bar is less than the combined length of the two grooves, thus permitting movement of the head blocks without interference from the supporting blocks.

Referring to Fig. 5, an enlarged detail view of the supporting bar 14 is disclosed, from which it will be seen that the supporting or bearing surface 16 thereof is con-

caved; the degree of curvature of said face corresponding substantially with that of the tire or wheel which is being treated. In actual practice a series of supporting bars are supplied with each machine, the several supporting bars having varying transverse dimensions and also having the degree of curvature or concaveness of their supporting faces 16 varied to correspond substantially with the degree of curvature of wheels of varying diameter. When it is desirable to use a supporting block, the transverse diameter of which may be smaller than the transverse diameter of the grooves 15, 15', suitable liners may be interposed between the respective sides of the block and the side walls of the groove, thus substantially preventing lateral movement of the block relative to the head blocks A and B, but permitting longitudinal movement of the head blocks relative to said block and the wheel supported thereby. In order that the wheel may have a substantially solid support, the bottom face of the supporting members 14 are perfectly flat and rest throughout the entire length of the said members on that portion of the two head blocks A and B which form the bottom of the groove 15, 15'. Flat bottom plates of different thicknesses may be placed under the member 14 to raise or lower same relatively to the upper face of heads A and B to accommodate different thicknesses of tires.

Each head block A and B is adapted to support and carry on its top or concaved surface 12, a pair of gripping jaws 17, provided on their opposed longitudinal faces with suitable teeth or corrugations 18, the outer longitudinal faces of said jaws being beveled to correspond with and be guided by the opposed beveled faces of the side walls 13, 13^b whereby said gripping jaws are confined on the head blocks and by which they are forced into gripping position relative to the tire when the head blocks are moved in the direction of upsetting.

We have provided certain novel means for imparting a preliminary gripping movement to the gripping jaws and also a further means for vertically adjusting the rear ends of the gripping jaws 17, whereby a maximum gripping surface to tires of varying diameter will be presented. The above-named means for imparting a preliminary gripping movement to the gripping jaws, comprises in the present instance, a rod 19 connected to the inner or enlarged ends of each gripping jaw by having one end of said rod 19 bent or forged upward and working in a slot cut in the under side of head block A, said rods 19 being positioned in shallow slots 20, formed in the head blocks A and B and located directly beneath the respective gripping jaws, the connection

between the rods 19 and the jaws being of such nature as to permit the raising of the rear ends of the jaws relative to the point of connection with the rods 19. The rear ends of each pair of rods are secured between ears 21 formed on the levers 22. These levers are journaled in any suitable manner on rods 23 extending transversely of the head blocks A and B, and are capable of limited oscillatory movement, while the lower ends of said levers are connected to chains 24, which, in turn, travel over sheaves or pulleys 25, the lower ends of said chains being attached to cross arms 26 integrally formed on the foot lever 27.

By exerting pressure upon the foot lever 27 it will be seen that each of the gripping jaws will be symmetrically drawn rearwardly and thus brought into gripping engagement with the interposed tire against the resistance of the leaf or other suitable spring 28 which is secured to the head blocks and tends to hold the said blocks in their normal or inoperative position. The means for vertically adjusting the gripping jaws 17 so that the maximum gripping surfaces may be presented to wheels of varying diameters, comprises a bifurcated shifter 29 which is adapted to have substantially vertical movement within a tapering vertical slot 30 extending transversely beneath the gripping jaws of each head block. In order that there may be no interference between the rods 19 and the shifter plate 29, suitable vertical cuts 31 are formed in the upstanding arms of the shifter plate, the longitudinal rods being adapted to fit within said cuts. The lower end of each of the shifter plates 29 is pivotally connected with a small lever 32, fulcrumed in any suitable bearing 32', secured to the head blocks A and B, while a pair of chains 33 complete the connection between the free ends of said levers and to the cross arms 34 of the foot lever 35, whereby upon downward movement of the foot lever from its normal position, the shifter plate 29 will be forced upward and thus raise the rear portion of each of the gripping jaws. The foot lever 35 which controls the vertical adjustment of the gripping members 17 is superposed relative to the foot lever 27 which controls the preliminary gripping movement of said jaws through the medium of the chains 24, levers 22 and rods 19, each of said foot levers being pivotally secured to the framework of the machine and adapted to have any suitable means for locking said levers in their adjusted positions, such for instance as a pawl and ratchet mechanism 33' similar to that shown in Fig. 2.

In order that the wheel and tire may be supported in their upright position on the block 14, suitable upright standards 36 and 37 are secured to the opposite edges of the

frame C. The standard or post 37 has a hinge connection with the holder 38, the top thereof being tapped to receive the screw 39 which is operated by the hand wheel 40 and the middle part formed by two bars, with an opening between. Extending upwardly from the standard 36 is a double post 41 with bolts or pins 42 placed at intervals as indicated in Fig. 4. A transverse lever 43 is passed between the bars of the holder 38, the end of screw 39 pressing on the upper side of the lever 43, when screwed down and the opposite end of the lever adapted to fit between the double posts 41 where it may engage any of the pins 42. Intermediate the ends of the transverse lever 43, a depending arm 44 (Figs. 3 and 4) is positioned which carries on its lower end a felly engaging head, suitably concaved transversely to more readily engage the inner face of the wheel felly. It will thus be seen that inasmuch as the standards 36 and 37 are secured to the frame of the machine, the wheel may be rigidly maintained in upright position regardless of the movement of the head blocks A and B, by simply adjusting the transverse lever in the double post 41 and then rotating the hand wheel 40 to force the depending arm 44 and its gripping head downward into engagement with the wheel felly.

When the machine is to be put in operation, a suitable supporting block 14 is selected, the curvature of the supporting face of which corresponds substantially to the curvature of the periphery of the wheel, which block is suitably arranged in the groove 15, 15', the wheel and tire being placed on said block. The arm 44 with its head 44^a which engages the inner face of the felly is then lowered, thus securing the wheel in upright position.

If it is necessary to vertically adjust the gripping jaws 17 in order to present the maximum gripping surface thereof to the tire of the wheel, the foot lever 35 is depressed until the desired adjustment is secured. The foot lever 27 is then depressed to draw the gripping jaws 17 into their preliminary gripping position.

When the various elements have been adjusted as above described, the pump F is put in operation, whereby the hydraulic pressure medium is introduced into the cylinder 1, thus causing the movement of the pistons in opposite directions. The movement of the piston 3 will carry the cross head 4 and the head block A in one direction while the piston 2 directly actuates the head block B in an opposite direction through the medium of the push block 8. The movement of the respective head blocks in opposed directions causes the gripping jaws 17 of the respective head blocks to wedge against and securely engage the tire of the wheel, which as the

head blocks continue to move is shortened or upset and made to fit the wheel tightly. As soon as the upsetting or shortening action is completed, the pressure medium is permitted to exhaust from the cylinder 1 thereby permitting the spring 9, which has been put in tension by the movement of the head blocks, to expand and thus force the said head blocks into their normal position.

10 While we have specifically described one embodiment of our invention, it will be understood that the various elements and their arrangement may be altered without departing from the spirit of our invention.

15 What we claim is:—

1. A tire setter comprising two independently mounted head blocks, each having a pair of gripping jaws, confined thereon by inclined side walls, preliminary adjusting connections for the jaws moving them in the direction opposite to upsetting, whereby they develop the upsetting space between them and relatively to the head blocks, whereby their initial gripping is produced, and a common operating means for said connections, whereby the jaws are symmetrically disposed in gripped relation to the tire and relatively to the fixed intermediate point.

20 2. A tire setter comprising two independently mounted head blocks, each having a pair of gripping jaws, said jaws having connections between their outer ends and a common operating means to symmetrically adapt the jaws to tires of different diameters, in combination with hydraulic means for actuating said tire setter.

3. A tire setter comprising two independently mounted head blocks, each having a central groove with a straight supporting bottom, a supporting block having an upper concave surface of substantially the same curvature as the periphery of the wheel under treatment, and a lower surface straight and in line with the bottoms of the head block grooves; said supporting block

being removably positioned in the grooves of said head blocks and bridging the space between the head blocks.

4. In a tire setter, the combination with a pair of oppositely disposed head blocks, each provided with a pair of longitudinal grooves, of pairs of gripping jaws slidably confined on the respective head blocks, a rod mounted in each of said grooves and loosely connected to one of the gripping members, and operating means connected to the outer ends of each pair of rods, whereby said jaws may be moved outwardly into gripping position.

5. In a tire setter, the combination with a pair of oppositely disposed head blocks, each provided with a pair of longitudinal grooves, of a pair of gripping jaws slidably confined on each head block, a rod mounted in each of said grooves and loosely connected to one of the gripping members, and operating means connected to the outer ends of each pair of rods, whereby said jaws may be moved outwardly into gripping position, and resilient means resisting the actuation of the operating means and adapted to normally maintain the gripping jaws in their inoperative position.

6. A tire setting machine, comprising a pair of oppositely moving head blocks, each having a pair of slidable gripping jaws, means having positive connection with the inner ends of each of the gripping jaws to move said jaws into gripping position, and vertically movable means for raising the outer ends of said gripping jaws.

The foregoing specification signed at Springfield, Ill., this nineteenth day of January, 1911.

HERBERT M. LOURIE.
HERBERT S. LOURIE.

In presence of two witnesses:
J. F. MILLER,
THOS. J. KENNEDY.