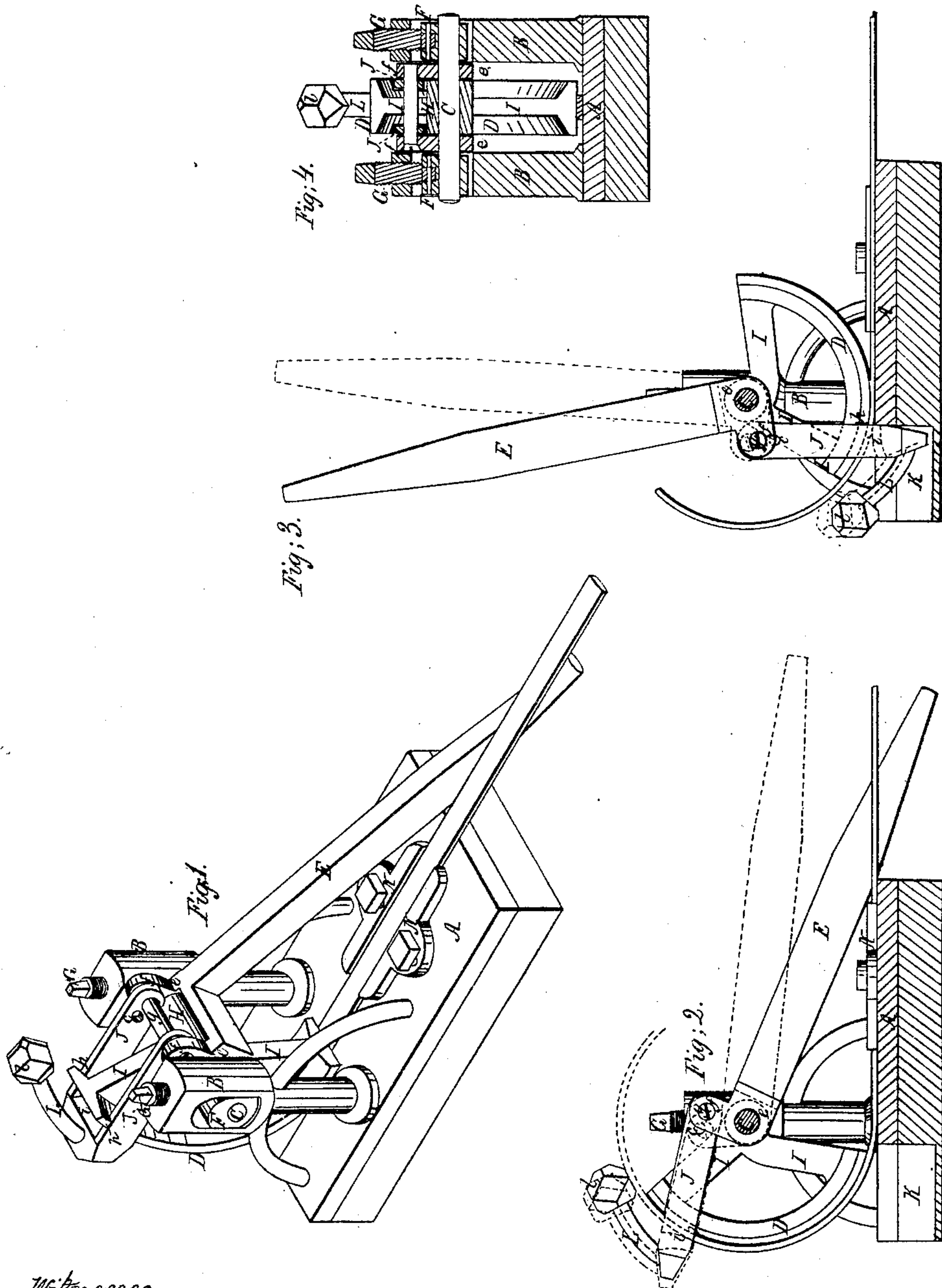


W. PATTERSON.
MACHINE FOR BENDING TIRES.

No. 23,388.

Patented Mar. 29, 1859.



Witnesses.
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MACHINE FOR BENDING TIRES.

Specification of Letters Patent No. 23,388, dated March 29, 1859.

To all whom it may concern:

Be it known that I, WILLIAM PATTERSON, of Constantine, in the county of St. Joseph and State of Michigan, have invented certain new and useful Improvements in Machines for Bending Tires; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing of the same, which makes part of this specification, and in which—

Figure 1, represents a view in perspective of a machine embracing my improvements. Fig. 2, represents a side elevation of the machine, one of the standards which support the axis of the segment being removed, the bed plate shown in section, and the operating parts occupying the positions they have, on the descent of the lever, to make the first bend of the tire. Fig. 3, represents a similar view, but showing the operating parts in the positions they occupy, when the lever is raised, and ready to make the second bend of the tire. Fig. 4, represents a transverse section of the machine, through the axis of the bending segment showing the arms of the lever mounted upon said axis independently of the segment.

I am aware that the mechanical elements of my machine are not new in themselves, as they exist in the patent, granted to Aaron Whitcomb, August 21st, 1839, but under an arrangement and construction very different from my improvements, as will appear obvious by an inspection of the drawings. Moreover my improvements produce results, and possess advantages, which cannot be attained under the arrangement and construction of said Whitcomb's machine.

My improvement consists, first, in attaching the lever, and segment, to the clevis, in such manner, that the lever will operate the clevis independently of the motion of the segment, so as to cause it to grasp and release the bar, in the operation of bending it, before the segment commences to move, as shown by the red lines in Figs. 2 and 3, of the drawings, whereby the difficulty and disadvantage of causing the segment to move before the bar is clamped by the clevis, when commencing to bend; and also of causing the segment to move before the clevis is released from the bar, after being bent, as is the case

under the arrangement and connection of the clevis and lever in Whitcomb's machine, is fully obviated.

The second part of my improvement consists, in providing the outer end of the clevis, with a weighted arm, so arranged in relation to the circumference of the segment, as to bear against the outer side of the bar, and thereby support it, during the operation of bending, above and beyond the end of the segment, by which, I am enabled to preserve the circle of the tire, by preventing it from springing back during the descent of the lever, as shown by black lines in Fig. 2, and red lines in Fig. 3.

The third part of my improvement consists, in making the clevis adjustable, for the purpose of adapting it to the use of segments of greater or less radius, in the same machine.

In the drawing A, represents the bed-plate, near one end of which, are mounted two pillars or standards B, for supporting a horizontal bolt C, which forms both the axis of the segment and the operating lever, and upon which, both are free to turn. The bolt C, is fitted into boxes F, F, which are suspended in slots in the standards by means of screws G, G, for adjusting the axis C, of the segment nearer to, or farther from the bed-plate to suit different thickness of the bars to be bent, and to adapt the machine to receive segments of different radius, for bending tire for different sized wheels.

The segment D, may be made of a greater or less arc of a circle than that shown in the drawings. I prefer however, to make it about the fourth part of the circle. The periphery or tread of the segment should be wider than the bar to be bent, and is connected to the hub H, by two arms I, for the purpose of lightness. Each machine is provided with two or more segments of different radius, and the mode of changing the one, for the other, will be hereafter explained.

The lever E, for operating the segment, is forked or divided at its inner end, into two branches e, so as to embrace the hub of the segment; and they are furnished with holes, through which the bolt C, passes, so that the lever, though, having a common axis with the segment, may have a motion independ-

ently of that of the latter, for a purpose which will be presently described. From the branches *e*, two other branch arms *f*, *f*, project at right angles to the lever, to which
 5 the rear end of a clevis is connected by means of a screw bolt *g*, passing through the said arms *f*, *f*, and the arms of the clevis, parallel to the axis of the lever.

The clevis consists of two arms *J*, extending on either side of the segment, and beyond its circumference, where their ends are united, leaving a space between its closed end, and the periphery of the segment, through which the tire passes. The
 10 clevis thus mounted upon its hinge *g*, has its grasping end maintained in the proper position to catch hold of, or release the bar to be bent, at the proper time, by being connected to the segment near its outer end.
 15 This connection is effected by fitting the arms *J*, *J*, of the clevis, into notches *h*, *h*, in the opposite sides of, and near one end of the segment. By this arrangement and connection of the clevis, and segment, with
 20 the lever, it will be seen, that the movement of the former to grasp, and release its hold on the bar during the successive vibrations of the lever, will be independent of the motion of the segment. This peculiar action
 25 of the clevis is illustrated in the drawings Figs. 2 and 3. In Fig. 3, the black lines show the relative positions of the lever and clevis, when the former is raised and just before the clevis is made to bite upon the
 30 tire.

The clevis occupies a vertical position, and its end projecting into a recess *K*, rests against the end thereof, so that the end of the opening or space *i* will be below the top
 40 of the bed-plate. It will also be seen, that the lever inclines slightly to the rear side of its axis, and is thus supported by the hinge *g*, of the clevis resting upon the arm *I*, of the segment, while the connection of
 45 the arms of the clevis with the periphery of said segment, locks the latter in its position, with the clevis resting against the end of the bed-plate. In this position of the parts, the clevis must have a movement to grasp
 50 the bar, before the segment commences to bend it, which is effected by the lever as shown by the red lines. When the clevis has grasped the bar, the descent of the lever completes the bend. The lever is then
 55 raised, which movement causes the clevis to move horizontally a sufficient distance from the bar to release its grasp thereon as shown by red lines, when the hinge *g*, of the clevis striking upon the arm *I*, of the segment as
 60 represented in Fig. 2, brings the segment down again, as shown in Fig. 3.

From the outer end of the clevis a curved arm *L*, projects, having a weight *l*, on its extremity in such position as to bear against
 65 the tire, during the operation of bending it,

for the purpose of holding it to its curve; because the sudden depression of the lever would cause the tire to spring back, (because being heated it will yield more readily) so that were it not for this supporting arm, the circle of the tire would be imperfect. This weighted arm also serves to hold the clevis in the proper position against the end of the recess *K*, to receive the end of the bar to be bent, by acting as
 70 a counterpoise to the lever, when in the position seen in Fig. 3, so that when inserting the bar, if it should not happen to pass freely into the opening *i*, but strike the end thereof, the weight will counteract the tendency of the clevis to yield, and thereby prevent the lever from falling down before the bar has been grasped. In Fig. 3, the position of the weighted arm when serving to support the tire, is shown by red lines, and
 85 in Fig. 2, by black lines.

The bar is guided, at the commencement of the operation into the opening of the clevis, by the attendant, after which its feed is effected by the clevis and is held between
 90 guide plates *N*, which may be adjusted to suit different widths of bars.

In removing the segment to replace it with another of a greater or less radius, the screw bolt *g*, of the clevis must be removed
 95 to draw the arms of the clevis out of the notches *h*, *h*, in the edges of the segment. The bolt *C*, is then withdrawn and allows the segment to be removed. The manner of adjusting the segment in place is obvious.
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In order to make the same clevis answer for the different sized segments, which may be used in the same machine, it is made adjustable by changing the position of its hinge *g*, in the holes *c*, formed in the arms
 105 of the clevis, in such manner as to increase or diminish the length of said arms, and thereby adapt the grasp of the clevis to the radii of the segment, because it is plain were it not for this adjustability, the same
 110 clevis could not be used with different sized segments.

This machine is equally adapted to bend tires in a cold, as well as heated condition.

Having fully described the nature of my
 115 improvements, I do not claim the method of bending tire by means of the segment, lever, and clevis; neither the combination of these elements, as they exist in the patent of Aaron Whitcomb. But
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I claim,

1. Connecting the clevis to the lever and segment, in such manner, that the lever will cause the clevis to grasp, and release its hold, on the bar to be bent, independently
 125 of, and before said segment commences to move, as illustrated by the red lines in Figs. 2 and 3, of the drawings.

2. Providing the outer end of the clevis with an arm *L*, *l*, so arranged in relation to
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the circumference of the segment, as to bear against the outer side of the tire, and support it (while being bent,) above the end of the segment, as represented in Figs. 2 and 3, 5 thereby preserving the circle of the tire, by preventing it from springing back, during the descent of the lever.

3. Making the clevis adjustable for the purpose of adapting it to the use of differ-

ent sized segments in the same machine, as 10 described.

In testimony whereof I have hereunto subscribed my name.

WILLIAM PATTERSON.

Witnesses:

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GERMAN BROWN.