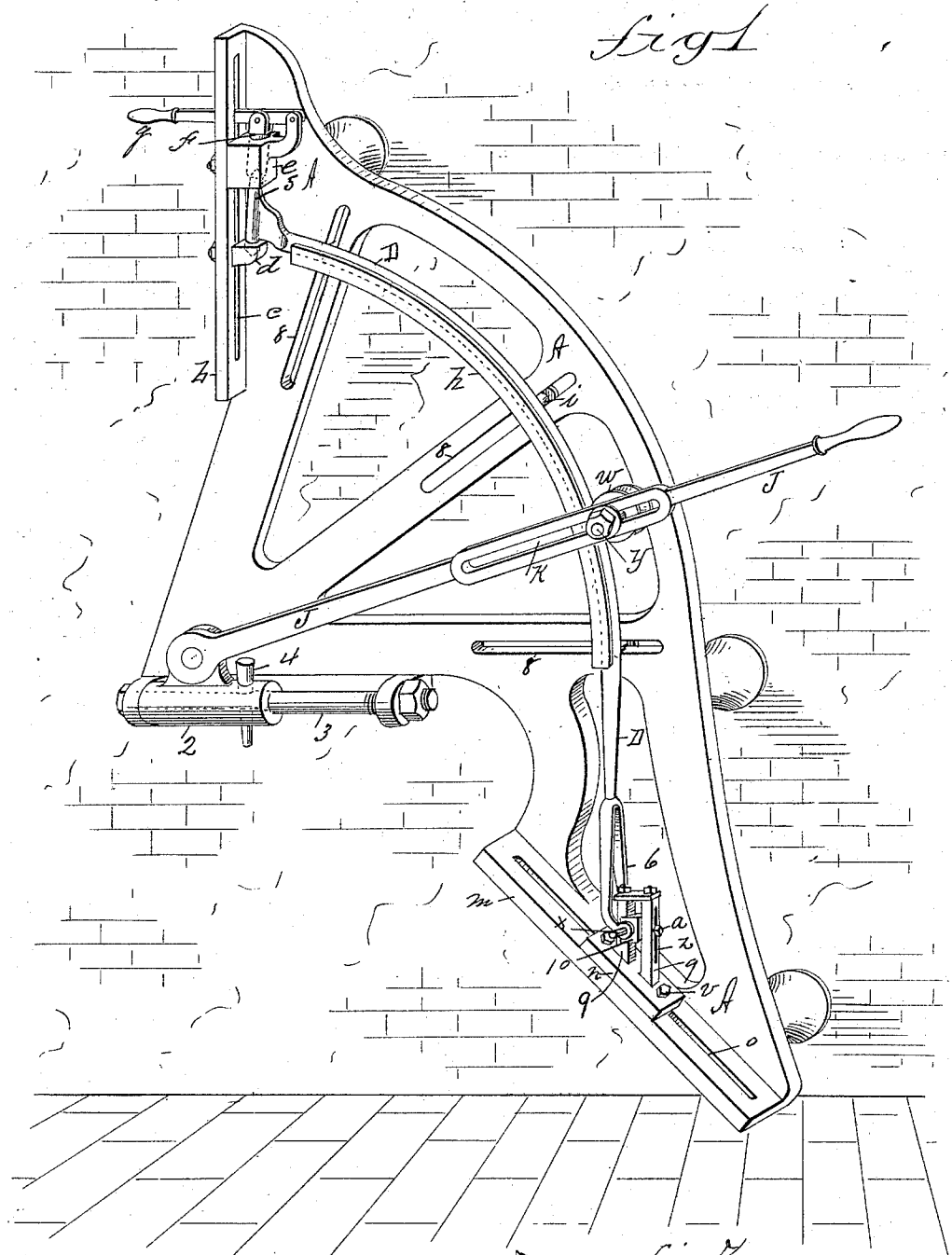
(No Model.)

G. T. WARWICK.

MACHINE FOR BENDING AND SETTING THE BACKBONES OF BICYCLES.

No. 328,986. Patented Oct. 27, 1885.

Fig 1



WITNESSES:

J. D. Lankford

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Fig 2

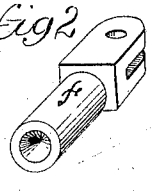
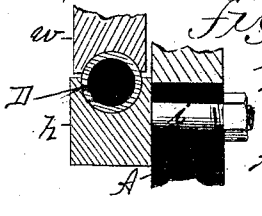


Fig 3



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MACHINE FOR BENDING AND SETTING THE BACKBONES OF BICYCLES.

SPECIFICATION forming part of Letters Patent No. 328,986, dated October 27, 1885.

Application filed October 31, 1884. Serial No. 146,903. (No model.)

To all whom it may concern:

Be it known that I, GEORGE T. WARWICK, a citizen of England, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Machines for Bending and Setting the Backbones of Bicycles, of which the following is a specification.

This invention relates to improvements in machines for bending and setting the backbones of bicycles, the object being to provide improved means for imparting a uniform shape to said backbones, and one which corresponds with the circumferential line of the large wheel, and, furthermore, to provide for so manipulating them as to avoid flattening the tubular part thereof.

In the drawings forming part of this specification, Figure 1 is a side view of a machine for bending the backbone of bicycles embodying my invention. Figs. 2 and 3 are detail views.

In the drawings, A is the frame of the machine having the slotted lips *b* and *m*, upon which the operative parts are mounted. The frame is also provided with the slots 8, for the purpose hereinafter stated.

A circular former, *h*, is secured adjustably to frame A by bolts *i* on its rear side, which pass through the slots 8 and have nuts on their ends, as in Fig. 3, which shows a section of frame A, the former *h*, the backbone D, and the roller *w*, which nuts screw against the said frame to secure the former *h* in any desired position thereon. The slots 8 permit of moving the former as may be desired, the latter being provided with a half-round groove in which the backbone is received when bent to its proper form.

A pivot-sleeve, 2, to which lever J is pivoted, is hung on a rod, 3, which is supported on frame A. A pin, 4, passes through the sleeve 2 to secure it in place on rod 3 when the lever is worked. Lever J extends beyond the edge of frame A, and has a suitable handle thereon.

A roller, *w*, is hung on lever J by means of a bolt, *y*, which is adjustably secured in the slot K in the lever, so that it may be set to properly co-operate with the former *h* to force the backbone against the latter.

The lip *b* on frame A is provided with a slot, *c*, and two blocks, *d* and *e*, having bolts thereon which pass through said slot, are thereby secured on the lip, and may be set at variable distances apart. Block *e* has a plunger, *f*, therein in a passage through the block, and is capable of being moved up and down by a lever, *g*, pivoted to it and to an arm on the block. The lower end of the plunger has a cone-shaped socket in it, as shown in Fig. 2. The block *d* has a socket in its upper side.

The lip *m* on frame A has a slot, *o*, in it, and a tail-block, *n*, is fitted to slide thereon or to be secured thereto, as circumstances may demand, guided or secured by the bolts *v*, which pass through slot *o*.

Between standards 9 on block *n* a block, 10, is fitted, secured to one of said standards, which has a slot, *z*, in it, by a bolt, *a*, whereby block 10 may be at times free to move up and down, or be secured in a fixed position between said standards. A pin, *x*, passes through block 10, as shown in Fig. 1.

The backbone D as usual consists of a pivot-stem, 5, of wrought-iron, and a fork, 6, within which the small wheel runs, and that part thereof between those parts is made of tubing, all properly secured together; but when so united the tube is usually straight, and has to be bent to such form as will adapt it to the size of the wheel of the machine of which it is to form a part, and the manner of operating the machine to so bend the backbone is as follows: The machine is secured to a wall or other suitable place. Lever *g* is raised to lift plunger *f* and allow of inserting the upper end of stem 5 in block *e*, so that its lower end can be seated in block *d*, and then lever *g* is forced down, bringing plunger *f* against stem 5 and firmly holding it. The tubular part of the backbone having been heated, the lever J has its pivot end freed by withdrawing pin 4 and letting sleeve 2 slide on rod 3 until roller *w* can be brought to a bearing on the tube, when sleeve 2 is forced to its place and pinned, and lever J is swung from lip *b* toward lip *m*, forcing the fork 6 near to the block 10 in block *n*, and the latter is then moved to such a position as will permit of securing the fork to block 10 by the pin *x*. The lever J is now worked back and forth, roller *w* bearing on said tube until the latter is made to conform to the

former *h*, and when cooled the backbone is removed from the machine and the operation is repeated.

Block *n* is held to lip *m* by the bolts *v*, but is allowed to move to accommodate itself to the movements of the fork 6, the block 10 meanwhile having a suitable movement between the standards 9 to prevent any binding of the fork while the backbone is being rolled to the desirable form.

The former *h* can be changed and roller *w* be moved to different positions on lever J, thereby providing for forming backbones adapted to be used with wheels of different diameters; and by use of this machine all danger of flattening the tube is avoided, and uniform work is produced.

The adjustable features of the blocks *d*, *e*, and *n* on their respective lips *b* and *m* provide for moving them to bring them into proper relation with the former *h* when that is moved on frame A; or, in other words, when a former is used which is a segment of a larger or smaller circle than that of the former shown in the drawings, which conditions, of course, embrace a corresponding change of position of the former toward or from the pivoted end of the lever J, and a changed position of the roller *w*.

What I claim as my invention is—

1. In a machine for bending and forming the backbone of a bicycle, a frame, a lever pivoted to the frame, a roller adjustably attached to said lever, a former secured to the frame, and means, substantially as described, for holding the stem and forked ends of the backbone in position, and whereby said forked end is permitted to have suitable movements while the backbone is being shaped, combined and operating substantially as set forth.

2. In combination, the frame A, the blocks *d* and *e*, the movable former *h*, the block *n*, having standards thereon, the block 10, lever J, having a movable pivotal connection with the frame, and the roller *w*, adjustably attached to the lever, substantially as set forth.

3. In combination, frame A, the rod 3, sleeve 2, pin 4, the lever J, wheel *w*, and the former *h*, substantially as set forth.

GEO. T. WARWICK.

Witnesses:
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J. D. GARFIELD.