

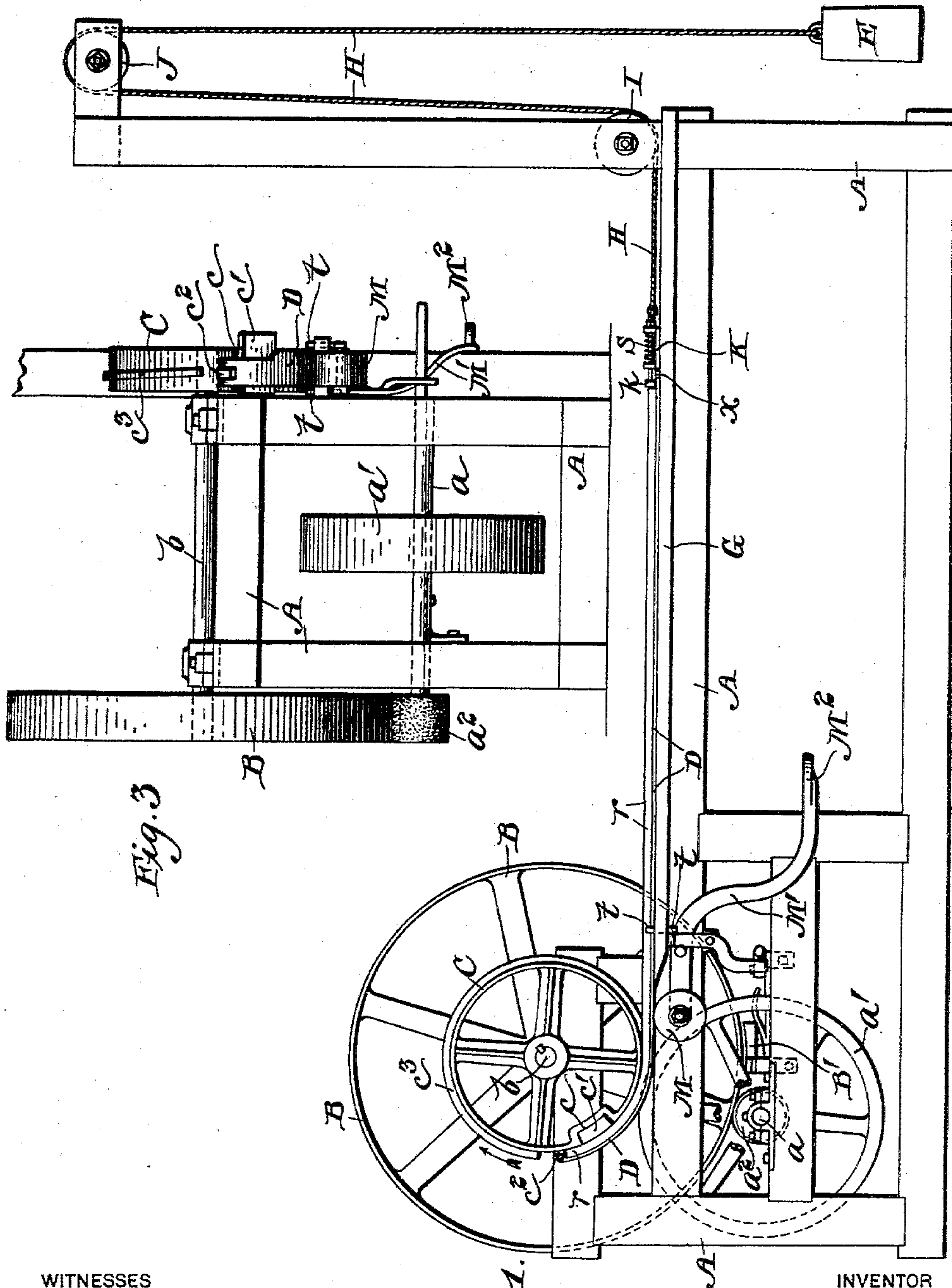
(No Model.)

2 Sheets—Sheet 1.

A. A. FERGUSON.  
MACHINE FOR BENDING BICYCLE RIMS.

No. 596,744.

Patented Jan. 4, 1898.



WITNESSES

*Severance*  
*E. P. Chas*

Fig. 1.

INVENTOR

*Amos A. Ferguson*  
*by his atty*  
*Mass. Fennick Lawrence*

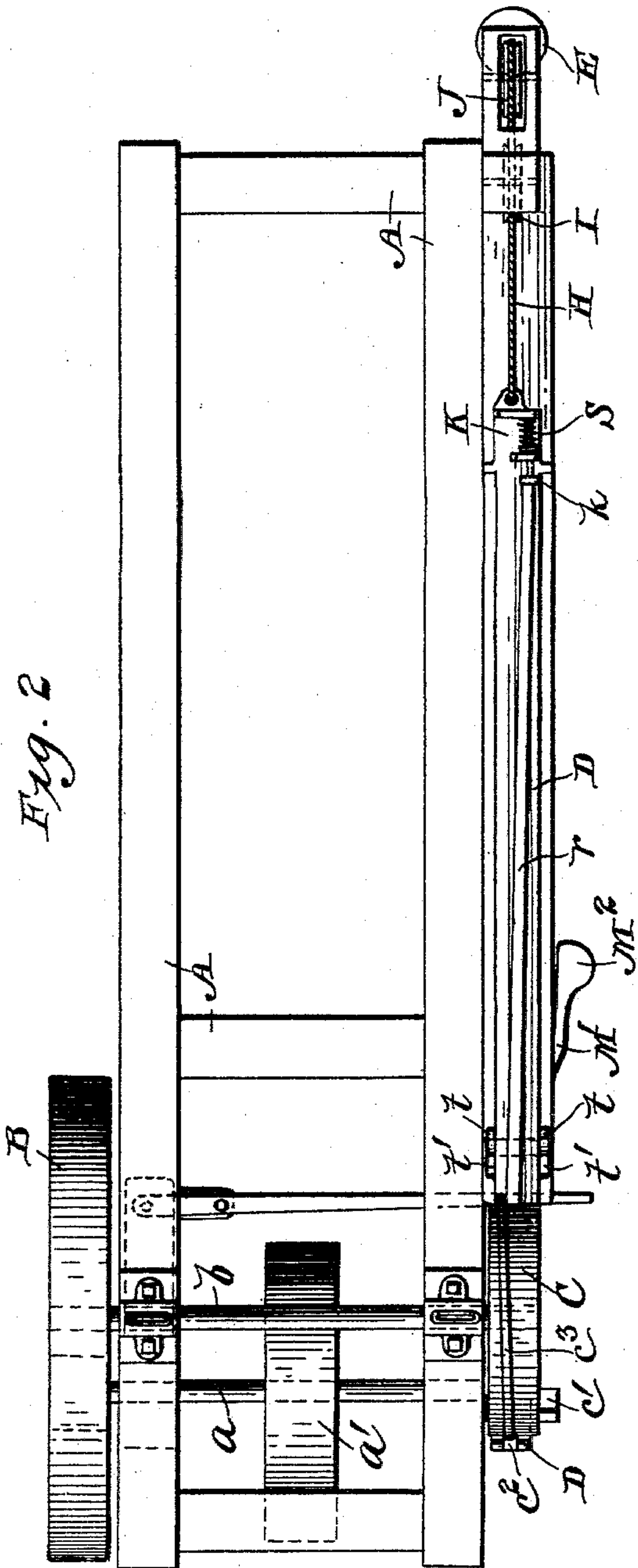
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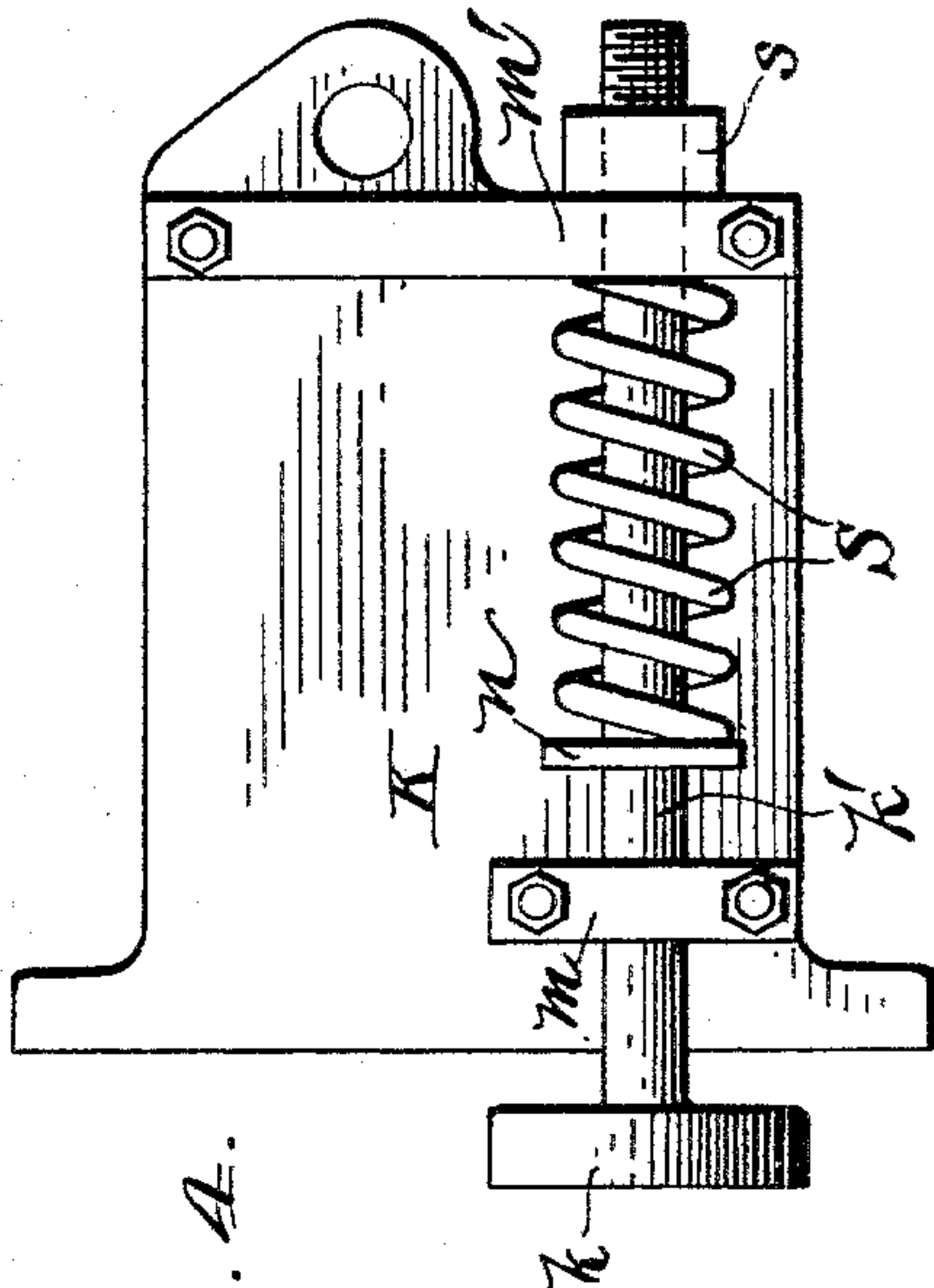
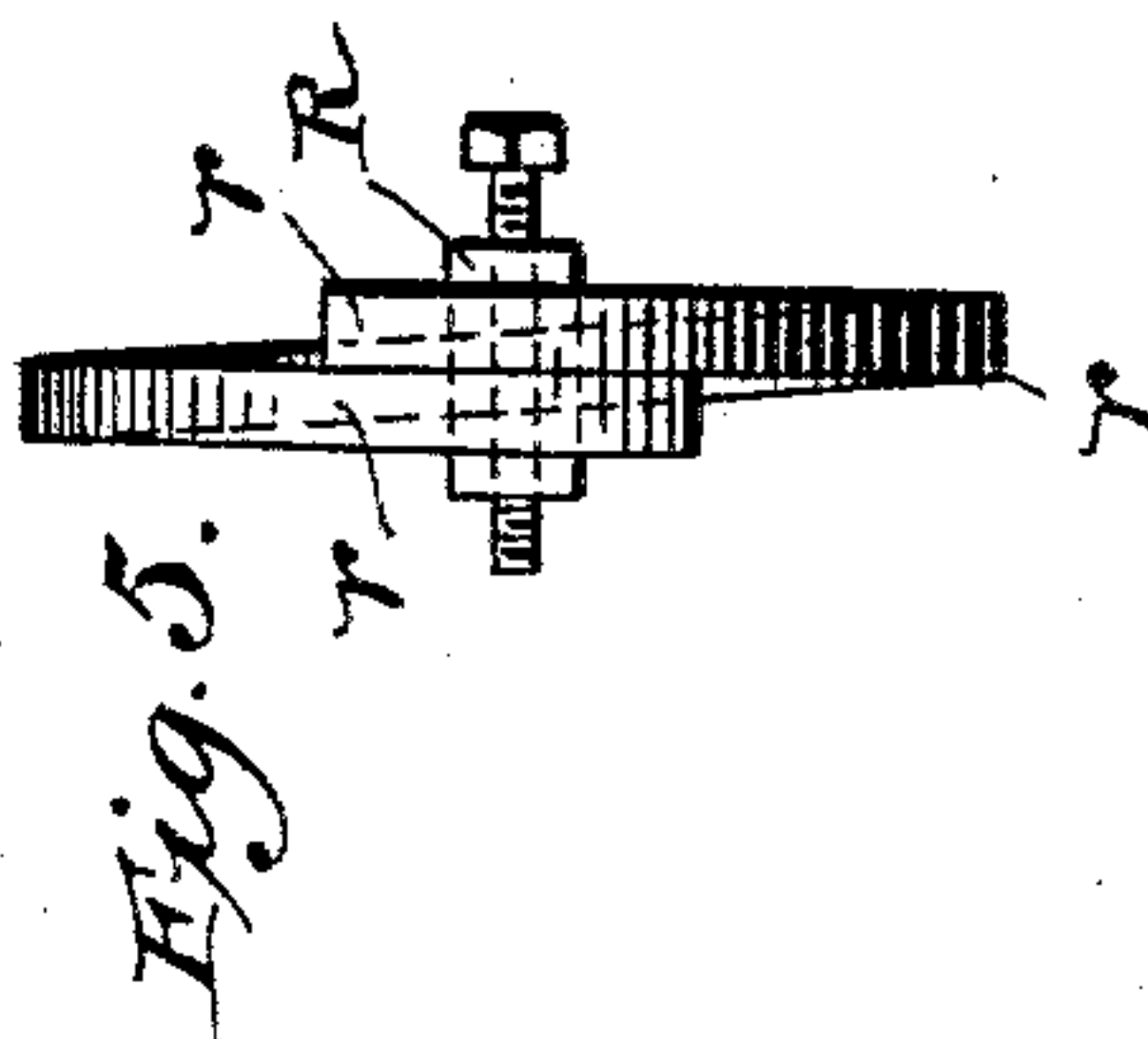
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WITNESSES

*G. P. Clift*



INVENTOR

*A. A. Ferguson*  
by his Attorney  
*Wm. T. Smith*



# UNITED STATES PATENT OFFICE.

ANSON A. FERGUSON, OF NEW LONDON, WISCONSIN, ASSIGNOR OF ONE-HALF TO MARSHALL D. KIETH, OF SAME PLACE.

## MACHINE FOR BENDING BICYCLE-RIMS.

SPECIFICATION forming part of Letters Patent No. 596,744, dated January 4, 1898.

Application filed September 10, 1896. Renewed August 9, 1897. Serial No. 647,646. (No model.)

*To all whom it may concern:*

Be it known that I, ANSON A. FERGUSON, a citizen of the United States, residing at New London, in the county of Waupaca and State of Wisconsin, have invented certain new and useful Improvements in Machinery for Bending Bicycle-Rims; and I declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

My invention relates to that class of wood-bending machines used to bend bicycle-rims. The wood is first steamed and then placed in the machine and bent around a wheel between the periphery of the wheel and a steel flexible band, as will be hereinafter more specifically described. It is a well-known fact that in bending strips of wood in this manner the outside grains and layers of the wood are stretched and the inside grains depressed when making a curvature and that the strip will always be a little longer after it is curved than when it first enters the machine.

The object of my invention is to provide a means of holding and relieving the strip and regulating the pressure, so as to prevent stretching the outside fibers of the wood and buckling of the inside fibers. In the machines heretofore used, where the outside fibers were permitted to stretch they became weakened and were liable to splinter and crack and the inside fibers were liable to bunch and buckle up. By means of my invention I am able to regulate the stretching of the outside fibers of the wood and the compressing of the inner fibers to any degree desired, so that the ratio shall be proper for strength and durability.

In the accompanying drawings, forming part of this specification, Figure 1 is a side elevation of a machine embodying my invention. Fig. 2 is a plan view of the same. Fig. 3 is an end view of my said machine. Fig. 4 is an enlarged detail view of the relieving and regulating device, and Fig. 5 is a view of the completed rim with ends clamped together.

Similar letters refer to similar parts in each view.

A in the drawings represents the frame of the machine; B, the main balance-wheel; C, the bending-wheel; D, the flexible metallic strap, and E the strap-weight.

The frame A supports a transverse shaft *a*, upon which is mounted a belt-wheel *a'* and a friction-wheel *a''*. The shaft is movably mounted in the frame. The friction-wheel *a''* revolves continuously and is brought in contact with the wheel B to start the machine by means of a suitable lever. This wheel B is mounted upon a transverse shaft *b*, which carries the bending-wheel C at its opposite end. This latter wheel is provided with a depression *c* in its periphery, said depression being normally filled by a removable block *c'*, so that the wheel prevents an unbroken peripheral surface. The wheel C is provided with a lug *c''*, to which is pivoted one end of the metallic flexible band D. A rib or guide *c'''* is formed upon the periphery of the wheel for guiding the rim which is being bent. It is set slightly at an angle, as shown, so as to make the ends of the rim properly lap each other. G is a table upon which the band D rests, the opposite end of the said band being attached to a cord H, which passes around the pulleys I and J and down to the weight E. The relieving device K is riveted or otherwise rigidly attached to the top of the band D at the rear end.

The relieving or regulating device K is composed of a head *k*, integral with a sliding rod *k'*, which slides in guides *m m'*. The rod *k'* is provided with a shoulder *n* and a spring S, the latter being located between the shoulder *n* and the guide *m'*. The nut *s*, screwing upon the end of the rod *k*, regulates the tension of the spring S.

In operating the machine one end of the strip of wood is placed against the head *k*, the strip resting upon the steel band D, and the opposite end being clamped between the band and the periphery of the wheel C at or near the lug *c''*. Before starting the machine the removable block is fitted into the depression *c*.

In the operation of the machine two operatives are necessary, one to stand at the front



end, near the wheel C, to apply the power by the foot-treadle and to clamp and remove the strip after it is bent. The other operative stands at the side of the machine near the relieving device K, receives the strip from the steaming device, and places it against the head *k*, extending it diagonally across the strip D, as shown, and against the guide C<sup>3</sup>, so that in bending the strip around the wheel C the ends will lap each other laterally, as shown in the finished rim. The block *c'* is then removed and a clamp applied to the two ends of the rim.

M is an idler-pulley mounted upon a pivoted arm M' and adapted to be pressed upward against the strap D by a foot-lever M<sup>2</sup>. The object of this treadle is to press the band D against the strip of wood after the wheel C has stopped in its revolution and while the clamp is being adjusted to hold the ends together.

In the operation of the machine the workman at the rear places a strip of wood upon the steel band D and against the head *k*, permitting it to extend forward diagonally across the strip D and between the opposite end of the band D and the periphery of the wheel C at or near the lug *c'*. The operator in front then by a lever or other means puts on the friction and starts the machine. The wheel C is revolved in the direction indicated by the arrow and the end of the strip of wood becomes clamped between the periphery of the wheel C and the upper face of the steel band D. The revolution of the wheel C carries the band attached thereto with it around and against the lower face of the wood strip, compressing it and curving it, at the same time arresting the weight E, which operates as a tension to the band, and also returns the band to its original position after each operation of the machine. When the band has moved forward sufficiently, the projections *xxx* upon the relieving device K strike against the pins *t t* and, moving them forward in the slots *t' t'*, operate to throw off the friction-wheel *a'* and operate the brake B' to stop the machine. As soon as the friction is removed the weight E operates to pull the band D back to its original position and the brake, operated by a spring, controls the tension, so that it will be slowly returned.

In the bending of the strip the front end is rigidly clamped between the band D and the periphery of the wheel C, and as the strip is being bent the fibers are stretched and some relief must be had in order to prevent splintering or bunching. This relief is provided by means of the spring S, the head *k*, carrying the shoulder *n*, being gradually compressed against the spring S as the strip is wound around the wheel. In this manner the outer fibers or grains of the strip are compressed and the inner fibers released to the proper degree, and the proper degree may be easily secured by regulating the tension of the spring S by means of the nut *s*. After

the strip of wood has been bent around the wheel sufficiently the false block before mentioned may be driven sidewise out of the depression *c* and the clamp R be screwed through the depression to clamp the two ends of the rim *r r* together. A separate clamp is necessary for each rim, and in this condition (shown in Fig. 5) the rims are ready for market and are sold, to be afterward finished and polished for use.

\* If the strip is permitted to stretch without any relieving or regulating device before it is bent in a circular form, the inner fibers will bunch or buckle up and the outer fibers crack or split, so as to destroy the strength of the wood.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a machine for bending wood rims, the combination of a bending-wheel, a raised peripheral guide on said wheel, and adapted to guide the rim upon one side for causing the ends to lap each other but in such a manner as to permit of said rim being slipped laterally from said wheel after being bent, a flexible band secured to said wheel for inclosing the rim and means for rotating and controlling the said bending-wheel, substantially as described.

2. In a machine for bending wood rims, the combination of a bending-wheel, a raised peripheral guide on said wheel integral therewith and adapted to guide the rim on one side for lapping the ends and yet in such a manner as not to interfere with the lateral removal of the rim from the periphery of the wheel when bent, a lug upon said wheel, a flexible band secured to said lug for inclosing the rim to be bent, a relieving device comprising a spring-pressed plunger, a tension device for holding said band taut and returning the same to its unwound position, and means for operating the said bending-wheel, substantially as described.

3. In a machine for bending wood rims, the combination of a bending-wheel having a portion of its rim depressed to form a recess in its periphery adapted to receive and be filled by an independent removable block during the bending operation, the said block being adapted to be removed or knocked out before removing the bent rim for the purpose of inserting a clamp to properly clamp the ends of the rim together, a lug upon the periphery of the wheel, a flexible band secured to said lug for inclosing the rim to be bent and means for operating the bending-wheel, substantially as described.

4. In a machine for bending wood rims, the combination of a bending-wheel having a portion of its rim depressed to form a recess in its periphery adapted to receive and be filled by an independent removable block, said block being adapted to be removed or knocked out before removing the bent rim for inserting a clamp to hold the ends of the



rim together, a lug upon the bending-wheel, a flexible band for inclosing the rim to be bent, means for holding the rim in its bent condition until the clamp has been inserted  
5 and means for operating the bending-wheel, substantially as described.

5. In a machine for bending wood rims, the combination of a bending-wheel, an integral guiding-rib upon the periphery of said  
10 wheel for guiding the rim upon one side only, whereby it may be slipped laterally from the said periphery after being bent, a flexible band secured to the wheel, at one end and provided with a relieving device at the other  
15 end comprising a plunger, a tension-spring and means for adjusting the same, and a weight connected to said band for holding it in place, and returning it to its normal position, substantially as described.

20 6. In a machine for bending wood rims,

the combination of a bending-wheel, a fly-wheel upon the shaft of said bending-wheel, a friction-wheel connected with a source of power, means for throwing said friction-wheel  
into and out of operative engagement with 25 the fly-wheel, a brake for the fly-wheel, a steel band for inclosing the rim to be bent upon the periphery of the bending-wheel, a relieving device comprising a spring-pressed plunger and means adapted to be engaged by said  
30 relieving device for automatically throwing off the power and applying the brake, at the proper time, substantially as described.

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

ANSON A. FERGUSON.

Witnesses:

F. J. MCKENNEY,  
MAUD CAMPBELL.