

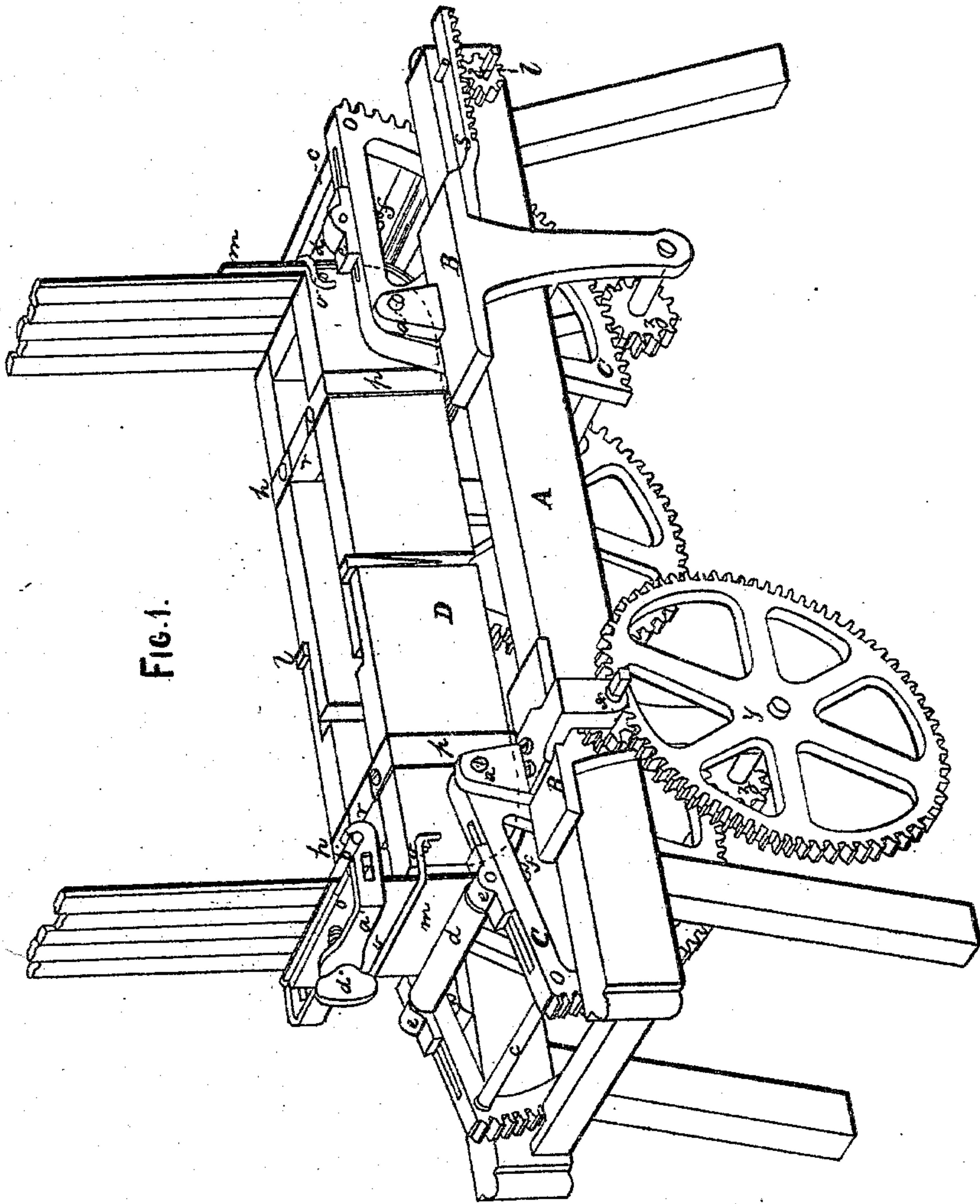
Sheet 1. 2 Sheets.

*J. Hann.*

*Wood Bending Mach.*

*Patented July 6. 1869.*

N<sup>o</sup> 92,187.



Witnesses.

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FIG. 2.

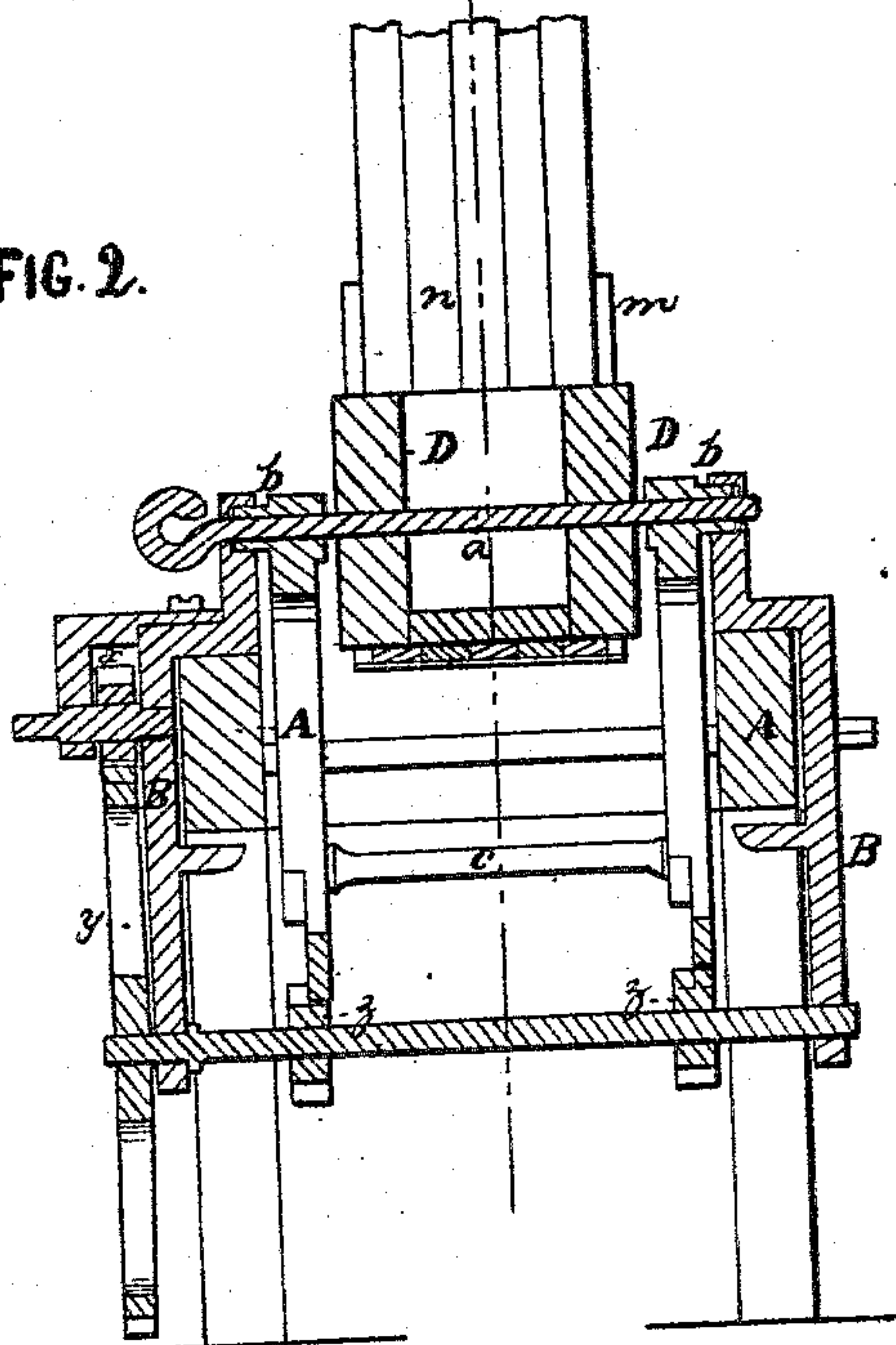
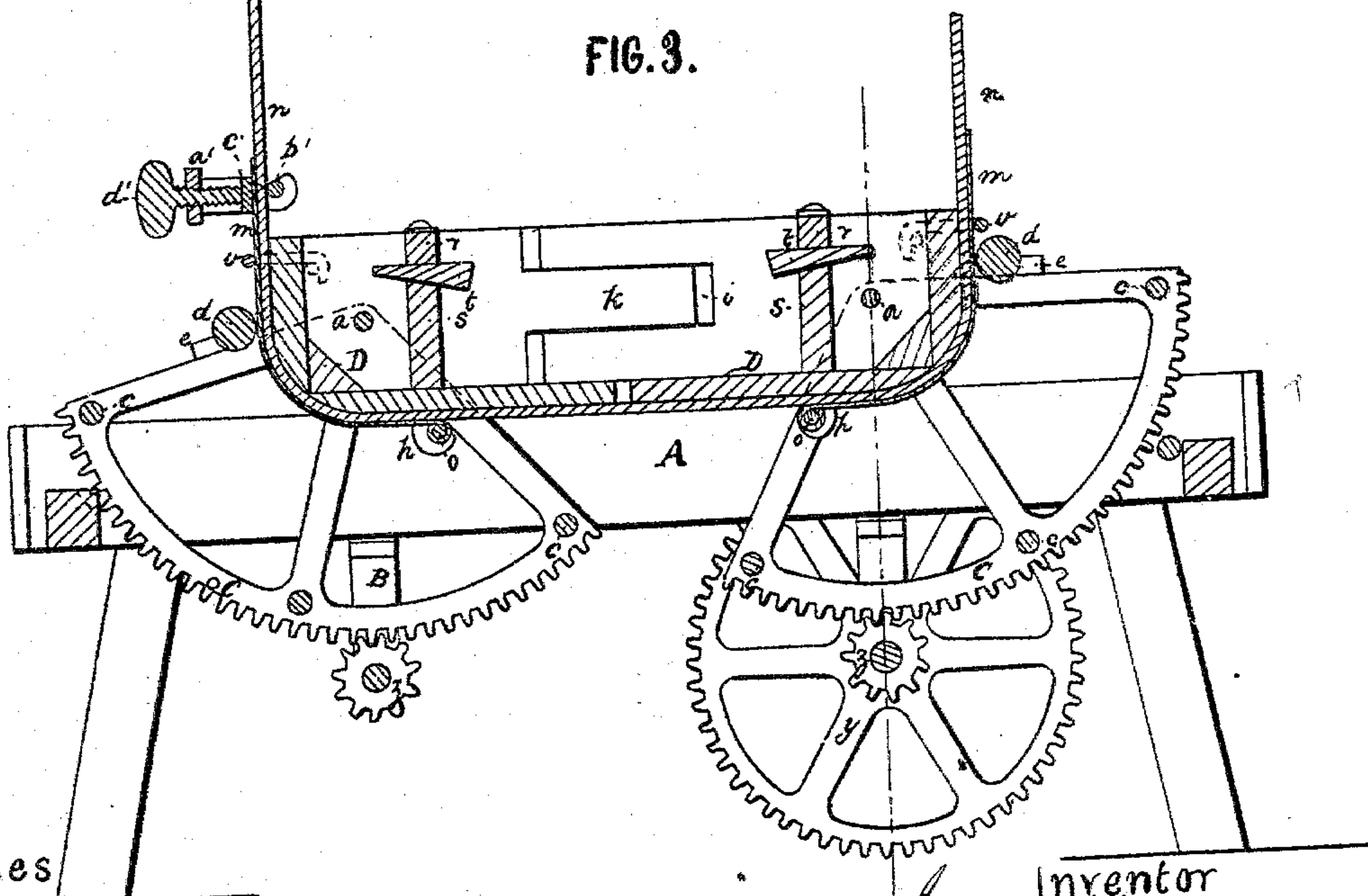


FIG. 3.



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# United States Patent Office.

JAMES HANN, OF FRENCHTOWN, NEW JERSEY.

Letters Patent No. 92,187, dated July 6, 1869.

## IMPROVEMENT IN MACHINERY FOR BENDING WOOD.

The Schedule referred to in these Letters Patent and making part of the same.

*To whom it may concern:*

Be it known that I, JAMES HANN, of Frenchtown, county of Hunterdon, and State of New Jersey, have invented certain new and useful Improvements in Machines for Bending Wagon-Bows and other Articles; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of a machine made in accordance with my invention;

Figure 2 is a transverse vertical section; and

Figure 3 is a longitudinal vertical section of the same.

My invention relates to machines for bending wooden articles, such as wagon-bows, &c., upon a former, by means of vibratory frames, by which the wood is bent and pressed into shape around the former; and my object is to improve and simplify the construction of a machine of this kind, to render it adjustable to various sizes of wagon-bows or other articles to be bent, and to allow of the ready removal of the former-box without deranging the other parts of the machine.

My invention may be stated in general to consist—

First, in the combination with the former upon which the wood is bent, of vibratory toothed sectors, carrying the rolls, (whether the same be adjustable or not,) by which the wood is pressed into shape, and actuated by the means herein described, or their mechanical equivalent, to move around the former.

Second, in the combination with the sectors, when provided with tubular journals, which are supported in suitable bearings in the frame of the machine, of the former-box, held upon the axis of said sectors, by means of pins, or rods passing into and supported by the tubular journals, whereby, whenever desired, the box can be released, by removing the pins, without disturbing the position of the sectors.

Third, in the employment, for the purpose of supporting the sectors, of movable frames, capable of being adjusted longitudinally, to conform to the size of the former.

Fourth, in the employment of a sectional former-box, capable of being extended or contracted, according to the size of the wood, as hereinafter described.

Fifth, in the method of supporting the metal plates, which are placed under the former-box, and around the parts of the wood which are to be bent, for the purpose of preventing the splitting or breaking of the wood, during the bending-operation, by means of straps, which hang from a bar, arranged in or upon the former-box, and capable of being raised or lowered, so as to hold or release, by means of the straps, the end of the metal plate supported by said straps.

Sixth, in the combination of the vibratory sectors and their adjustable frames, and the sectional former-box, capable of being contracted or extended, as above specified.

To enable others skilled in the art to understand and use my invention, I will proceed to describe the

manner in which the same is or may be carried into effect, by reference to the accompanying drawings.

The main frame A of the machine can be made of any suitable size and shape, to receive the wood-bending devices, and it supports the metal frames B, which constitute the bearings for the toothed sectors C.

At each end of the former-box D is a pair of these sectors, the former-box being located between the two sectors of each pair, or set, and supported in such position by means of a pin, or rod, *a*, at each end of the box, which extends through the metal frames B, box D, and the tubular journals *b* of the sectors, which are hung in bearings in the metal frames.

Under this arrangement, it will be noticed that the sectors have a support entirely distinct from that of the box, so that when the pins *a* are withdrawn, the latter can be removed without at all disturbing the other mechanism.

The sectors of each pair are connected by cross-bars *c*, in such manner as to admit of their extended movement, without interfering with the former-box, and they are driven by a train of toothed wheels, *x y z*, or in any other suitable manner.

Extending across upon the upper part of the sectors, at each end of the machine, is the forming, or bending-roller *d*, mounted in bearings *e*, held in slots formed in the arms of the sectors, and adjusted by means of set-screws *f*.

The roller thus moves with the sectors, and bends the wood upon the ends of the box, which ends are rounded off, to follow a circle, of which the axis of the sectors is the centre.

In order to admit of the distance between the two pairs of sectors being varied, to accord with the size of the former-box employed, I make the two metal bearings, or frames, B, at either or both ends of the machine, capable of being adjusted or moved longitudinally upon the main frame A.

For this purpose, the frames B are so constructed as to carry also the wheels *x y z*, and their shafts, which thus are moved bodily along with the frames and their sectors.

Any suitable means can be employed to effect the adjustment of the frames, but I prefer to employ for the purpose a rack, *g*, attached to or forming part of each frame to be adjusted, which engages with a pinion, *h*, mounted on a shaft extending through the machine from side to side.

By rotating the pinion-shaft, the two frames with which it is connected can be simultaneously adjusted, so as to approach or recede from the set of frames at the other end of the machine, according to the size of the box to be employed.

Again, in order to obviate the necessity of keeping on hand former-boxes of different sizes, to correspond with the varying dimensions of the bent articles to be produced, I make the former-box in sections, so that it can be extended or contracted at pleasure.

The sections may be made to extend or contract in



many ways, but that represented in the drawings I consider to be much the most preferable.

As then represented, the former-box is composed of two sections, which are united by a dovetailed tongue and groove-joint, *i k*, so that they may be slid apart or toward each other, according as it is required to lengthen or shorten the former.

The sections are held apart to the desired extent, by means of wedges *Z*, as shown in fig. 1.

By thus constructing the box, it may be made to answer for any size of wagon-bow, or like article.

As hereinbefore mentioned, metal plates are applied to those points on the wooden strips which are likely to split or break at any time during the bending-process.

These plates are shown at *m*. There is one at each end of the former-box, applied to the exterior of the bows *n*, at the point where they are bent, by the former-roller, around the curved ends of the box.

In order to hold them in place, the end of each plate which is located beneath the box, is bent around or secured to a rod, *o*, whose ends fit in hooks formed in straps, or hanging-arms *p*, which extend up on the outside of the box, and are secured to a bar, and fitted or secured to the box, so as to be capable of moving up and down.

Under the bar *r* is a fixed piece, *s*, and, by driving wedges *t* between the two, the movable bar can be raised, so as to draw up the straps *p*, the hooked ends of which hold the rod *o* and end of the plate *m* firmly against the bows *n*, and hold the bows themselves in position to be acted on by the forming, or bending-rollers.

By knocking out the wedges *t*, the straps *p* will drop, and the plates can be readily removed.

These plates are applied while the bows are yet unbent, and as the forming-rollers, moving with the sectors, force up the bows around the former-box, they press against the plates *m*, which are thus bent with the bows, and prevent the latter from being damaged in any way.

When the bows and plates are fully bent up, they are held in position by the hooked clasps *v*, which pass around them, and catch over pins on the box.

To clamp the upper end of the plate and bows, I make use of the device shown in fig. 1. It consists of a hooked and slotted frame, *a'*, the side-pieces of which have formed at their ends hooks, or bearings, to receive a removable holding-rod, *b'*.

Between the rod and the front of the frame *a'* is a sliding clamp-plate, *c'*, whose journals are held in longitudinal slots in the sides of the frame, and this clamp-plate is actuated by means of the thumb-screw *d'*.

To use the device, the rod *b'* is removed, and the frame placed so as to bring the plate *m* and wagon-bows against the clamp-plate and between the sides of the frame.

The rod is then replaced in its open hooked bearings, and, by turning the thumb-screw *d'*, the clamping-plate *c'* is caused to advance, so as to hold the bows and protecting-plate firmly between it and the rod *b'*.

The device is exceedingly simple in construction and convenient for use, and the plate *c'* is free to turn on its journals, so as to accommodate itself to the posi-

tion of the plate *m* and bows, and to exercise an even pressure upon them.

The method described of constructing the pairs of sectors which carry the bending-rollers, and of combining with them the former-box, is very advantageous.

The sectors have a considerable range of movement without interfering at all with the box, or preventing the ready insertion of the bows under the box, preparatory to bending them, and by imparting to each sector a positive movement, by means of the driving-gear, the bending-rollers are moved evenly and without danger of lateral twist or strain.

The advantages resulting from the adjustability of the bearings of the sectors, as well as from the adjustability of the box, are apparent, and I desire to repeat, that while preferring the means of adjustment herein illustrated, I do not limit myself to such specific means, as other and modified arrangements for effecting the same result may obviously be made.

What I claim, therefore, as my invention, and desire to secure by Letters Patent, is—

1. The combination of the former upon which the wood is bent, and a set or pair of vibratory toothed sectors, at each end of the former, carrying the forming, or bending-rolls, and actuated to move around the ends of the former, said parts being constructed and arranged to operate substantially as and for the purposes set forth.

2. The toothed sectors and bearings, in which their tubular journals are held, in combination with the former-box and pins, or rods passing through the former-box, and into or through the tubular journals of the sectors, arranged to operate substantially as described, whereby the box can be released, by removing the pins, without disturbing the position of the sectors.

3. The employment, for the purpose of supporting the toothed sectors, of movable bearings, or frames, capable of being adjusted longitudinally, so as to conform to the size of the former-box, substantially as shown and described.

4. The sectional former-box, or frame, constructed and arranged substantially as shown and described, so as to be extended or contracted, to conform to the size of the article to be bent, as set forth.

5. The combination of the vibratory sectors, their adjustable frames, or bearings, and the sectional former-box, arranged to be contracted or extended, as herein described, under the arrangement substantially as specified.

6. The arrangement in the adjustable or movable frames, or bearings, which support the toothed sectors, of the driving-gear, by which such sectors are actuated, substantially as set forth.

7. Supporting the metal plates *m*, by means of straps, or arms, which hang from a bar arranged in or upon the former-box, so as to be raised or lowered, and thereby hold or release the end of the said metal plates, substantially as shown and described.

In testimony whereof, I have signed my name to this specification, before two subscribing witnesses.

JAMES HANN.

Witnesses:

N. D. WILLIAMS,  
E. G. WILLIAMS.