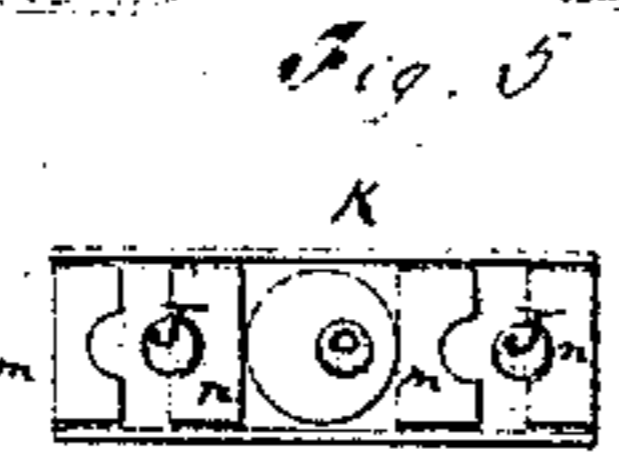
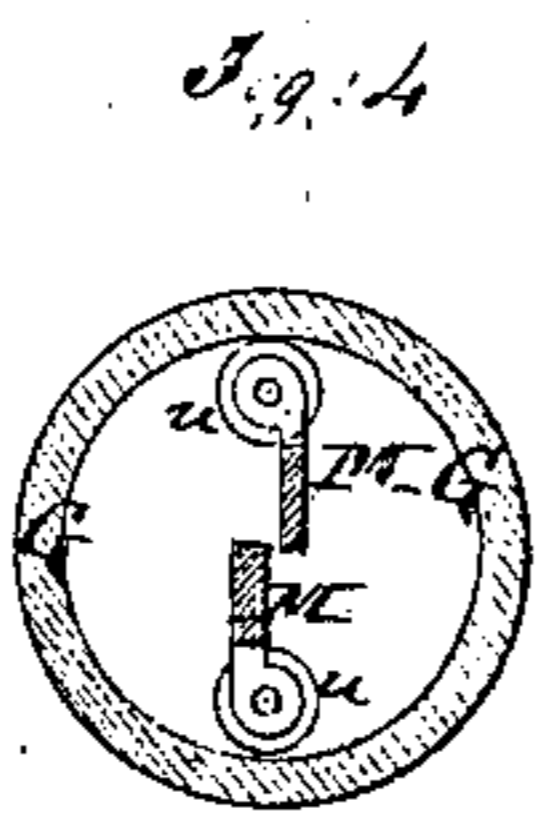
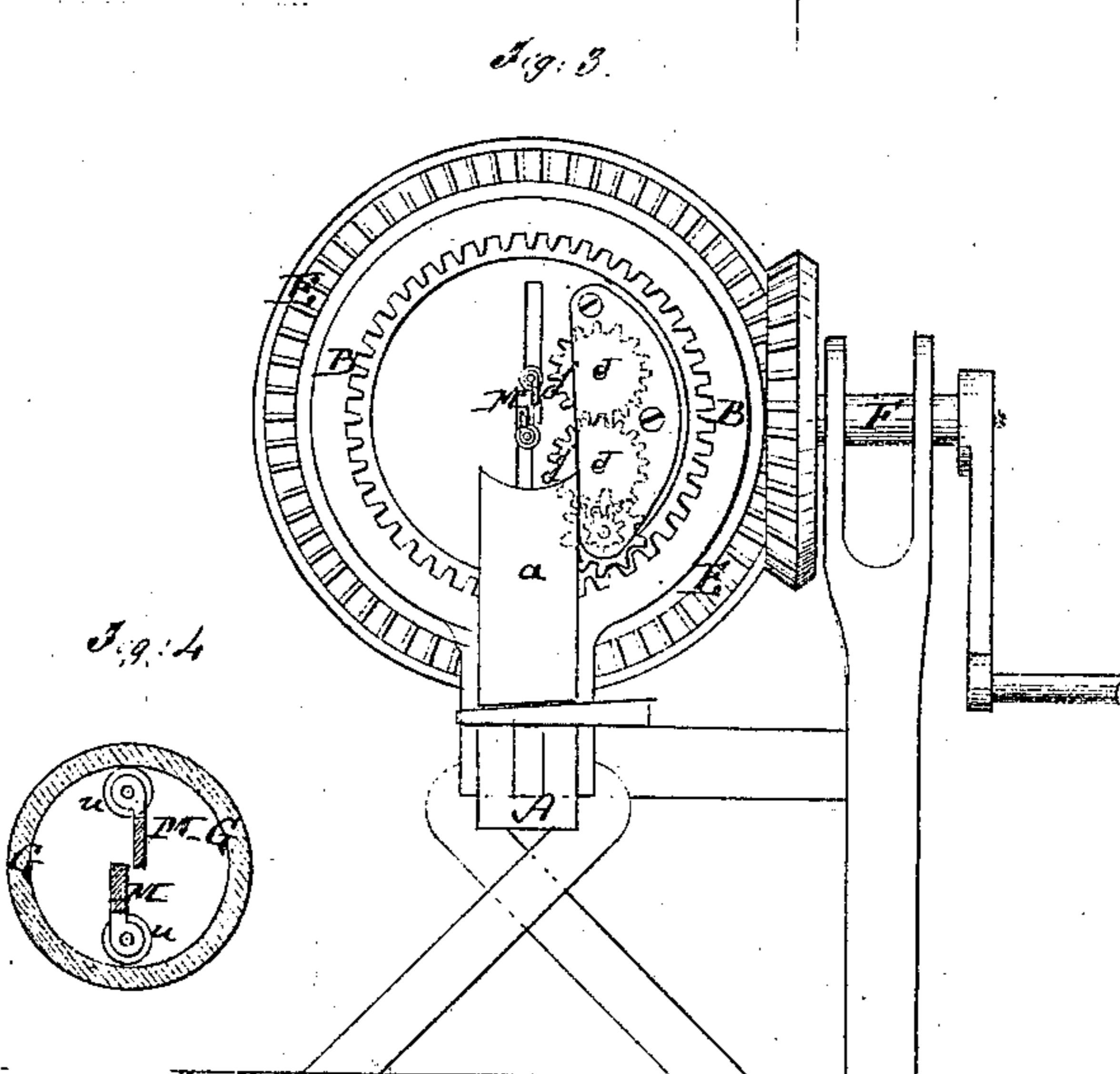
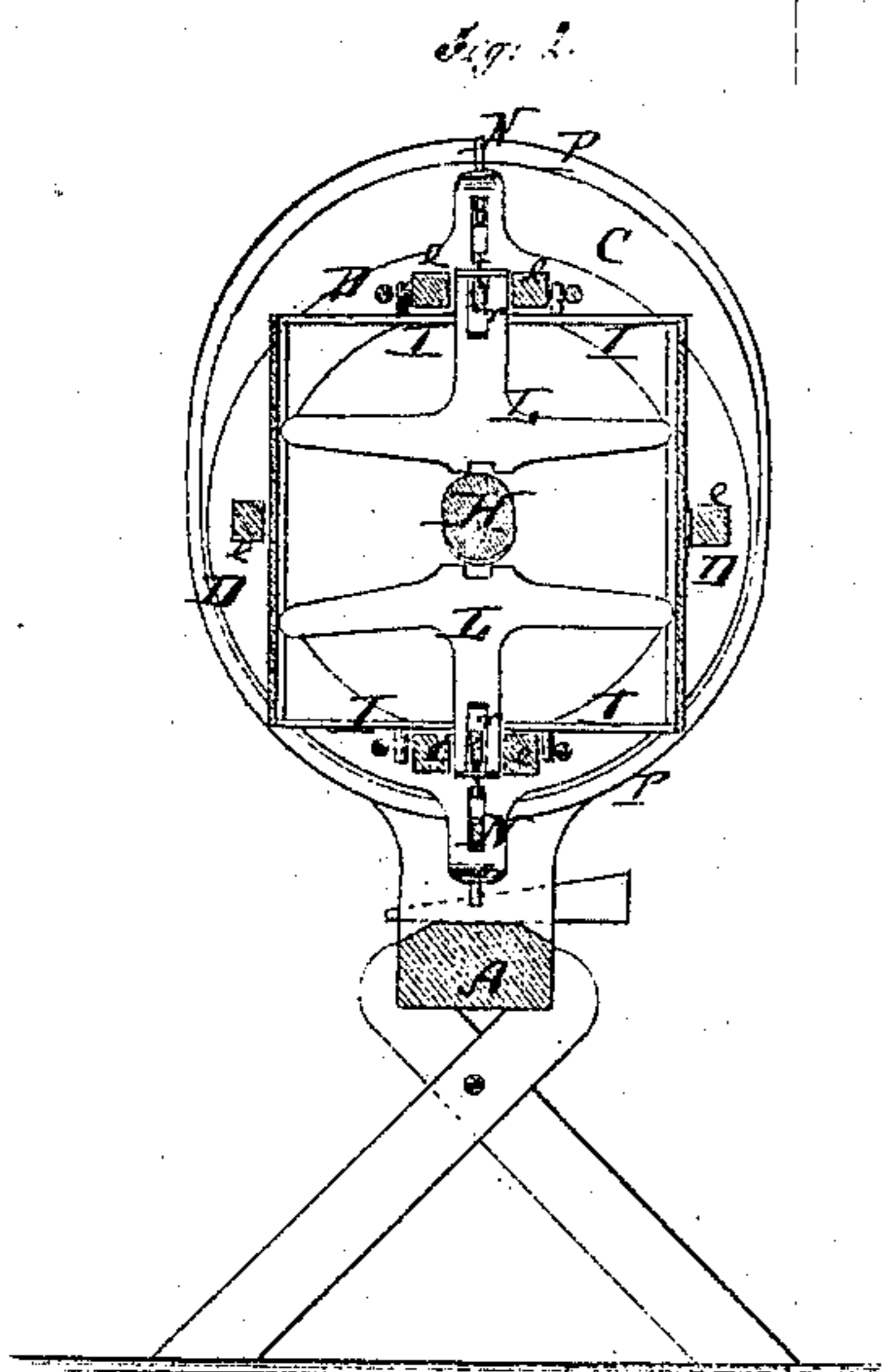
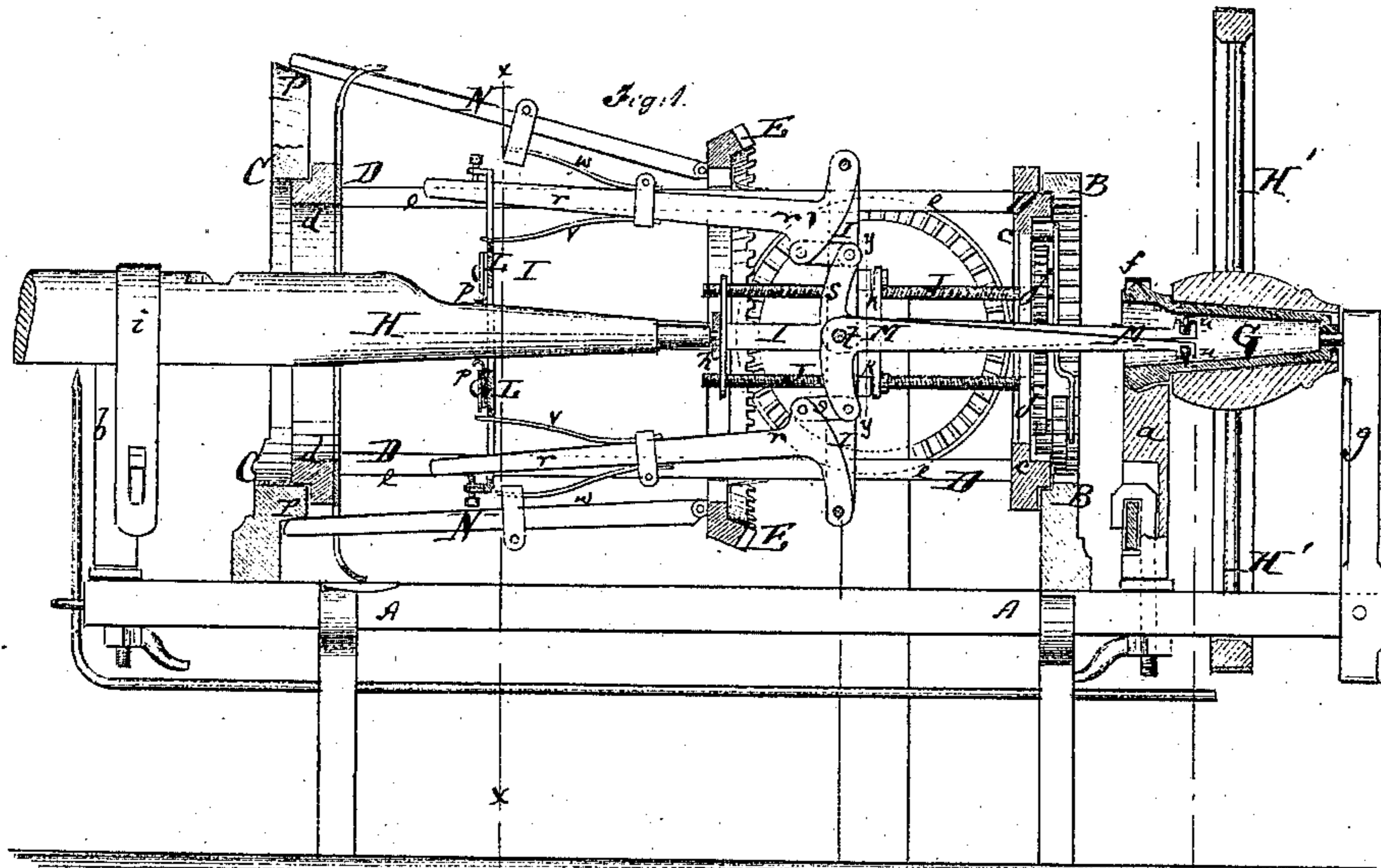


*W. H. Heffley,*  
*Turning Axle Trees.*  
*No. 106,364. Patented Aug. 16. 1870.*



**Witnesses:**  
*Chas. Nide*  
*E. S. Maber*

**Inventor:**  
*W. H. Heffley*  
*Attorneys.*

# United States Patent Office.

WILLIAM H HEFFLEY, OF ROCHESTER, INDIANA, ASSIGNOR TO HIMSELF  
AND DAVID BARB, OF SAME PLACE.

Letters Patent No. 106,364, dated August 16, 1870.

## IMPROVEMENT IN MACHINE FOR TURNING AXLE-TREES.

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

To all whom it may concern:

Be it known that I, WILLIAM H. HEFFLEY, of Rochester, in the county of Fulton and State of Indiana, have invented a new and Improved Machine for Turning Axle-Trees; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification.

Figure 1 represents a plan or top view, partly in section, of my improved machine for turning axle-trees.

Figure 2 is a vertical transverse section of the same, taken on the plane of the line *x x*, fig. 1.

Figure 3 is an end elevation of the same.

Figure 4 is a detail transverse section, on an enlarged scale, of the thimble and spring arms within it.

Figure 5 is a detail vertical transverse section of the machine, taken on the plane of the line *y y*, fig. 1.

Similar letters of reference indicate corresponding parts.

This invention has for its object to construct a machine for turning the end of axle-trees so that the same will correspond exactly with the thimbles or spindles into which they are to be fitted.

The invention consists chiefly in providing a mechanism whereby the inner form of the thimble is exactly transferred to the outer side of the axle, that is to say, a set of levers whose ends are pressed against the face of the thimble, controls the cutters which turn the axle.

The invention consists also in further details of mechanism, as hereinafter more fully described.

A in the drawing represents the frame of my improved machine. Upon it are secured two main standards, *a* and *b*, one near each end, and, between them, two vertically projecting rings, B and C, as shown.

The rings B C serve as bearings for the ends, *c d*, of a rotary frame, D, that is hung horizontally in them.

The frame D consists of the end pieces *c d*, and of horizontal rods *e e*, which connect the same at their outer parts. It carries a large bevel gear-wheel, E, which receives motion from a driving-shaft, F, that is hung in the frame A. The shaft F may be revolved by muscular or other suitable power.

Upon the front standard *a* is secured the thimble G, which is held down by a strap, *f*, and which may be further supported by an additional standard, *g*.

The wheel H may be fitted upon the thimble, if desired, but is not absolutely required. The strap *f* can be vertically adjusted with the thimble by means

of a wedge or other device, for the purpose of obtaining the desired position.

The axle-tree H, which is to be turned, is strapped upon the standard *b*, its inner end being centered in a cross-bar, *h*, of the frame D. The strap, *i*, which holds the axle-tree, can also be vertically adjusted.

The bars *e* of the frame D serve as rails for a longitudinal frame, I, which slides in the D, but revolves with the same. The frame I receives its longitudinal motion from one or more screws, J, which are hung in the frame D, and which carry pinions, *j j*, at their front ends, that are rotated by means of inner teeth on the stationary front ring B. As the frame D is revolved the screws will also be rotated, and will feed the frame I in the desired direction, according to the nuts with which they may be in gear.

The frame I has a cross-bar, *k*, which contains two sets of nuts, *m n*, (see fig. 5,) that can, alternately, be brought into use, one set serving to feed the frame I forward, while the other causes it to move backward. The nuts can be adjusted by means of a small arbor, *o*, which carries cams, whereby the nuts are set.

The cutters, *p p*, for turning the end of the axle-tree, are set into heads, L L, which slide transversely in the frame I, and which are, by pivoted levers *r* and links *s*, connected with two bell-crank levers, M M.

The levers M are both, by one pivot *t*, pivoted to the front part of the frame I, and reach, with their front ends, into the thimble, while their short arms connect with the links.

Friction-rollers, *u u*, are arranged on the front ends of the levers M. Springs V V serve to force the cutters against the axle-tree, and thereby, also, hold the front ends of the lever M apart. As the frame I is revolved with D around the axle-tree, and gradually fed backward, after the cutters were adjusted over the end of the axle, the motion of the cutters will be controlled by the position of the rollers *u*. The exact shape of the inner side of the thimble will, thereby, be transferred to the axle.

When the cutters have been fed as far backward as desired, their motion may be reversed by changing the nuts, as aforesaid, in order to smoothen the axle properly.

As the axle is more rounded on top and bottom than at the sides, it will be necessary to apply the cutters with greater power at the sides. For this purpose I have pivoted to the frame I pressure-levers N, one above each lever *r*, and affixed an outer cam-edge P, to the ring C, as shown.

The back ends of the levers N rest upon the cam-edge, and are pressed upon the same by spring *w*. The cam-edge is formed to correspond about with the cross-section of the axle end.

When the cutters are to be applied with greater

power, the cam-edge recedes, allowing the springs *w* to press the levers *N* against the heads *L* or levers *r*.

Having thus described my invention,

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination and arrangement of the rotary frame *D*, longitudinally sliding frame *I*, and transversely sliding cutter-heads *L*, substantially as herein shown and described.

2. The combination with the frame *I*, herein described, of the two sets of nuts *m n*, which can be adjusted to reverse the direction of the feed as specified.

3. The cutter-heads *L*, levers *r*, links *s*, and the

levers *M*, which revolve in the thimble, combined and arranged substantially as shown and described.

4. The combination of the pressure-levers *N* with the cutter-heads, and the fixed cam *P*, substantially as and for the purpose herein shown and described.

5. The springs *V V*, combined with the levers *r*, links, and levers *M*, to cause their simultaneous action, in the manner set forth.

WILLIAM H. HEFFLEY.

Witnesses:

WM. H. MATTINGLY,

WILLIAM CULVER.