J. S. SEAMAN.

METAL-SAWING MACHINE.

No. 175,768. Patented April 4, 1876.

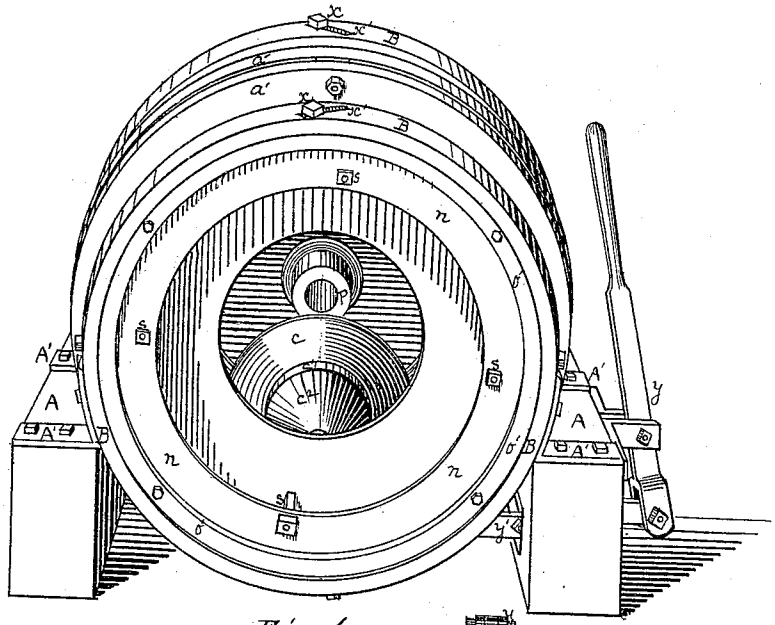

Fig. 1.

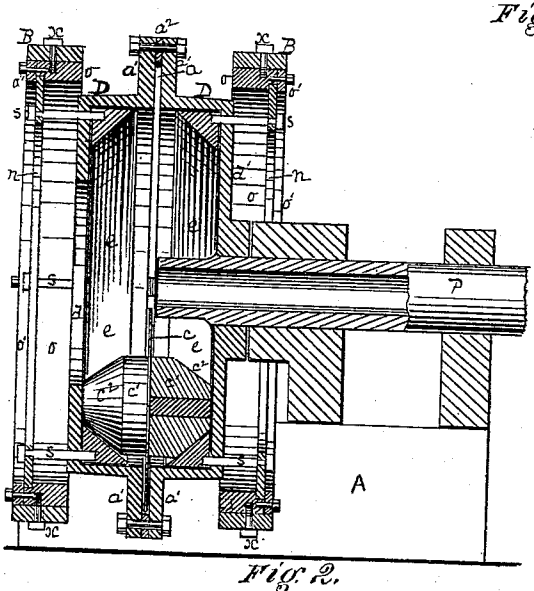

Fig. 2.

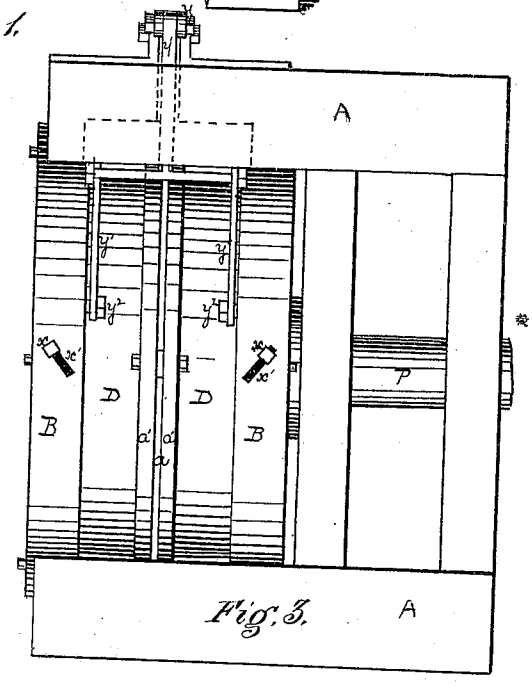

Fig. 3.

Witnesses.

Claudius L. Parker.

J. E. Boggs.

Inventor: Joseph S. Seaman,

by George H. Christy, his Atty.

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOSEPH S. SEAMAN, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO HIMSELF, JAMES B. YOUNG, AND ROBERT SLEETH, OF SAME PLACE.

IMPROVEMENT IN METAL-SAWING MACHINES.

Specification forming part of Letters Patent No. **175,768**, dated April 4, 1876; application filed March 17, 1876.

To all whom it may concern:

Be it known that I, JOSEPH S. SEAMAN, of Pittsburg, county of Allegheny, State of Pennsylvania, have invented or discovered a new and useful Improvement in Metal-Sawing Machine; and I do hereby declare the following to be a full, clear, concise, and exact description thereof, reference being had to the accompanying drawing making a part of this specification, in which—like letters indicating like parts—

Figure 1 is an end view, somewhat out of line, of my improved machine. Fig. 2 is a vertical longitudinal section, and Fig. 3 is an inverted or bottom plan view.

My invention relates to the construction of an improved machine sawing, cutting, or severing metallic rods, bars, shafts, roll necks or ends, or other metallic objects, by the use of a circular metallic disk, which shall simultaneously revolve on its axis and revolve around the article to be sawed, cut, or severed, the latter preferably remaining fixed in position during the operation. It also relates to suitable devices for feeding the disk toward the axial or central line of the article to be cut, sawed, or severed, as the work progresses. On any suitable foundation, A, I mount the machine by suitable rests A′, which rests are rigidly connected with the non-rotating rings B. Between these rings is a rotating box or drum, D, open, as at *d*, at one end, and either by a head, *d′*, at the other, or by radial arms connected with a hollow shaft, P, arranged in the axial line of the drum D. This drum is cylindrical in its general shape, but at or about midway of its length it has a deep annular groove, *a*, which for convenience is made by the use of a flange, a^1, on each half of the box, and interposed washers a^2, so that the bottom or outer periphery of the groove *a* shall be open through the greater part of its length for the discharge of the cuttings. The two halves of the box are secured together by bolts, or in other suitable way. The annular groove *a* is designed to receive the edge of the metallic disk *c*, which does the cutting or severing while such disk is at rest and during the earlier part of its operation. The disk *c*, made of any metal or metallic compound suitable for the work in view, is arranged in a hub, c^1, the ends of which are conical in form, as shown at c^2, one end of such hub being represented in section and one in elevation. These conical ends play on the inclined annular tracks *e*, which are arranged in the ends of the drum D.

The metallic article to be sawed, cut, or severed, is projected in or near the axial line of the drum, across the edge of the disk, with the plane of cut or severance opposite such disk, and for this purpose it may be introduced through the hollow shaft P or from the opposite direction, and in such position it is supported in any suitable way, such as is employed in kindred operations. A rapid rotary motion is given to the drum D either by a crank, pulley, or gearing applied to the hollow shaft P, or otherwise, as may be preferred, with the result of causing the disk *c* to revolve rapidly on its own axis, and also to be rotated with great rapidity around the article to be cut, sawed, or severed. The friction of the inclined annular track *e* on the conical ends c^2 of the hub c^1 is sufficient for this purpose, and the slope of the inclines and cones suffices to guide the disk in the path desired as against end play. As the disk *c* thus passes around the object to be cut, &c., it performs the work of cutting or severing to the extent that its operative edge will play or is caused to move toward the central line of the article to be severed.

In order now to feed the disk *c* toward the axial or central line of the article to be cut, so that it shall gradually cut deeper, I make the inclined annular tracks *e* adjustable toward or from each other, and as they move toward each other, their inclined faces, acting like wedges on the conical ends c^2 of the hubs c^1, gradually shift the latter, and with it the disk *c*, toward the central line of the machine, so that while still having the double rotary movement described it will cut progressively into and around, and, if so desired, through, the article to be cut. Any suitable eccentric device may be employed to effect this feed-motion, but I have shown one such. Each inclined annular track *e* is connected by posts *s* with a ring, *n*, the outer periphery or edge of

which works in a groove formed between the plates *o o'*. In such grooves the rings *n* revolve along with the drum D. The plates *o o'* are arranged inside the fixed frame-rings B B, and have pins or wrists *x*, which play in inclined slots *x'* in the exterior rings. A lever, *y*, and link y^1, connected to the plates *o o'* by bolts y^2, afford a means of gradually and at pleasure shifting these plates by giving them a partial rotation or a short rotary movement.

As the frame-rings B are fixed in place such partial rotation of the rings *o o'* results in the wrists or pins *x* shifting each set of rings *o o' n* toward or from the other set, and through the fixed or rigid connection of the posts *s* effects the desired adjustment of the two halves of the track *e*, so as to throw the disk *c* toward or from the center.

Various other modifications of the apparatus may be made, such as making one track fixed while the other remains movable. Also, the hub c^1 may be arranged to work between annular inclined double racks, and the disk *c* be arranged on the end of the projecting spindle and outside of the drum.

In speaking of the action of the disk *c*, as effecting a cut or severance, I do not wish to be understood as limiting myself to the use of a disk which will merely cut, saw, or sever. I include in my invention the elements hereinafter claimed, whether the disk described be found to act by cutting, sawing, severing, or, as some think, by fusing the metal which lies in the path of its action; and I also include in my invention the substitution of an emery or other grinding wheel in place of the disk, as a means of grinding metallic surfaces by a like operation. In such operation a longitudinal feed-motion should be imparted to the article operated on by means of suitable devices.

The drum and tracks may vary from a circular to an elliptical form or other modification of a circle where the cut to be made in the article is desired of other than a circular shape.

I claim herein as my invention—

1. The mode of transmitting power to run a revolving saw or cutter by means of revolving frictional bearings, substantially as set forth.

2. A circular saw or cutter having simultaneously a rotating motion on its own axis, and a revolving motion around the article or object to be cut, sawed, or severed, substantially as set forth.

3. An adjustable, sloping-faced, ring-shaped track, *e*, in combination with the conically-ended hub of a revolving saw or cutter, substantially as set forth.

4. An adjusting-lever, *y*, and suitable connections to, and in combination with, fixed frame-rings, movable adjusting-rings, adjustable track, and eccentric feed, substantially as set forth.

5. The box or drum D made with groove *a*, open on its outer periphery through the greater part of its length, substantially as and for the purpose set forth.

In testimony whereof I have hereunto set my hand.

JOSEPH S. SEAMAN.

Witnesses:

JNO. A. WILSON,

CLAUDIUS L. PARKER.